

LEARNING TO EXPRESS MOTION EVENTS IN L2 CHINESE:
A COGNITIVE LINGUISTIC PERSPECTIVE

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ABSTRACT

Research has shown that speakers of different languages conceptualize motion events in a language-specific manner. First-language (L1) predispositions for spatial organization or event construal have the potential to exert influence on second-language (L2) acquisition of motion expressions. Chinese, like English, is traditionally considered to be a satellite-framed language (Talmy, 1985, 1991, 2000). However, as a serial-verb language, Chinese exhibits different lexicalization patterns from English with respect to path encoding. Adopting the framework of Talmy (1985, 1991, 2000) for typological classification of motion events as well as Slobin's thinking-for-speaking (TFS) hypothesis (Slobin, 1987, 1996a), this dissertation offers an intra-typological comparison of Chinese and English and examines the various contributing factors that influence the use and acquisition of L2 Chinese motion expressions by adult L1 English speakers.

This study employed a multi-task approach, including a picture-cued written task, an oral narrative task, and an online judgment task, to measure learners' L2 TFS performance across different modalities. It discusses the behavior of 80 L2 Chinese learners at two proficiency levels, including participants with heritage background as well as those of foreign language background, as compared to two baseline groups of 40 Chinese native speakers (NSs) and 40 English NSs. The learners' performance was inspected according to their proficiency level and language background and was compared with that of the NS groups.

The results of this study show that L2 speakers' development in learning to describe motion events in Chinese is influenced by factors including their L2 proficiency level, the degree of syntactic and semantic complexity of the L2 subsystems, construal of L2 motion constructions, and language background. These factors go beyond a simple dichotomy of L1 or L2 thinking, and together they suggest that the influence of L1 TFS, like other kinds of L1 transfer phenomena, are sensitive to probabilistic tendencies. Conceptual changes in the course of L2 acquisition of motion expressions are dynamic and ongoing processes, in which multiple factors can come into play to determine whether or how L1 TFS affects L2 learning outcomes. Notably, among these factors, learners' embodied experiences for communicative use of motion expressions play a vital role in their internalization of L2 TFS.

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LIST OF ABBREVIATIONS

BA	<i>Bǎ</i> 把-construction
Bei	Passive marker <i>bèi</i>
CL.	Classifier
DC	Directional complement
E-languages	Equipollently-framed languages
FLLs	Foreign language learners
fMRI	functional Magnetic Resonance Imaging
Gen.	Genitive <i>de</i> 的
HLLs	Heritage language learners
L1	First language
L2	Second language
NSs	Native speakers
Perf.	Perfective aspect <i>le</i> 了
PET	Positron Emission Tomography
Prep.	Preposition
S-languages	Satellite-framed languages
SLA	Second language acquisition
TFS	Thinking for speaking
V-languages	Verb-framed languages
VP	Verb particle

CHAPTER 1 INTRODUCTION

1.1 Background

The relationship between spatial language and cognition has been the subject of an active and growing line of research (e.g., Bowerman, 1996; Choi & Bowerman, 1991; Gathercole, 2009; Hickman & Robert, 2006; Levinson, 2003; Slobin, 1998; Slobin, Bowerman, Brown, Eisenbeiss, & Narasimhan, 2010; Talmy, 1985, 2000; Wu, Morganti, & Chatterjee, 2008; see also Guo et al., 2009). Space is fundamental to human cognition. Children learn to describe spatial relations and motion events at a very young age (Berman & Slobin, 1994; Bowerman, 1996). Although all languages provide ways to talk about spatial relations and motions, features of the same spatial information can be mapped onto different linguistic units, and they can be selectively represented in foregrounded or backgrounded constituents across different languages. Previous studies provide converging evidence that speakers of different languages conceptualize motion events in a language-specific manner (e.g. McNeill & Duncan, 2000; Slobin, 1996, 2004; Slobin et al., 2010; Talmy, 1985, 2000; Wu, Morganti & Chatterjee, 2008).

Motion events typically involve an entity changing its location from one point in space to another (Özcaliskan & Slobin, 2003; Talmy, 2000). According to Talmy's (1991, 2000) binary typology of motion events, languages can be divided into either satellite-framed languages (S-languages) or verb-framed languages (V-languages), depending on how the path

is encoded for events involving movement. This influential typological distinction is by now well known and has received much support in studies of different languages (e.g., Berman & Slobin, 1994; Cadierno, 2004, 2008; Chen, 2007). Talmy's distinction not only captures the structural differences between languages of the two types, but also provides implications for studies of first- and second-language learning.

Extending Talmy's insights, Slobin (1996a, 1996b, 1997, 1998, 2000, 2003, 2004, 2006, 2010) and his colleagues have conducted crosslinguistic and developmental studies to explore the impact of motion event typology on language use. Slobin's work has demonstrated that speakers of typologically different languages exhibit diverse rhetorical styles when describing motion events. He proposed the TFS hypothesis (Slobin, 1987, 1996a, 2003) to account for the interplay between a language's available structural options and the rhetorical preferences of its users. TFS is "a special form of thought that is mobilized for communication" (Slobin, 1996a, p. 76). He suggests that, when acquiring their L1, children of individual languages gradually become attuned to different aspects of motion events, so as to develop language-particular patterns of TFS. Note that the TFS framework embraces all forms of linguistic production (e.g., speaking, writing, signing) and reception (e.g., listening, reading, viewing), as well as a range of mental processes including understanding, imaging, and remembering (Slobin, 2003). He further contends that L1 TFS is very likely to be "resistant to restructuring in adult L2 acquisition" (Slobin, 1996a, p. 89).

In light of Slobin's TFS framework and Talmy's motion event typology, L2 research has adopted a range of methodologies to examine how L2 learners with typologically different L1s and L2s come to express motion events. Cadierno (2004) and Choi and Lantolf (2008) found evidence showing that the learners' L1 TFS patterns influence the acquisition of a target L2, whereas in Brown and Gullberg (2008), parallel influences of L1 TFS on the L2, as well as that of L2 TFS on the L1, were both reported. Furthermore, Cadierno and Ruiz (2006) observed that the influence of learners' L1 TFS patterns on their L2 can diminish over time. Advanced learners are readier to adjust to L2 TFS patterns in their descriptions of motion events. Despite the increasing number of studies on this topic, the extent to which L1 TFS patterns influence L2 acquisition, and the question of whether L2 learners can shift toward the new L2 patterns, remain to be determined. It is possible that L1-based ways of TFS could persist into adult use of an L2. Alternatively, it could instead be possible that adult L2 learners may be able to adjust and conform to new L2 TFS patterns through instruction or interaction in natural contexts. The issue of whether and how L2 learners come to develop target-like TFS patterns is worthy of investigation. Specifically, it would be desirable to have a large-scale study that includes learners of different proficiency levels and measures L2 use of motion expressions across different modalities. Such a research design will help to better capture the effects of L1 TFS patterns that may exert differing degrees of influence over the course of L2 development or across different modalities.

1.2 Purpose and Significance of the Study

This dissertation adopts a cognitive linguistic framework, based on Talmy's (1985, 1991, 2000) typological classification of motion events as well as Slobin's TFS hypothesis (Slobin, 1987, 1996a), to investigate how English-speaking learners of Chinese come to express motion events in a target-like manner. Chinese, like English, is traditionally considered to be an S-language (Talmy, 1985, 1991, 2000). However, as a serial-verb language, Chinese exhibits different lexicalization patterns from English with respect to path encoding. It is for this reason that Slobin (2004, 2006) has proposed that Chinese falls in a third type, which he calls equipollently-framed languages. Concurring with Slobin, Chen (2007) and Chen and Guo (2009) argue that the structural and discourse characteristics of Chinese do not pattern fully with those of either S-languages or V-languages, and instead that they show hybrid patterns that are characteristic of both types. So far, L2 research on motion events has concentrated mostly on comparing L1s and L2s that are typical examples of Talmy's binary typology. The potential challenges associated with intra-typological variation are largely overlooked. Therefore, this dissertation offers an intra-typological comparison of Chinese and English (cf. Beavers, Levin, & Tham, 2010; Wu, 2011) and addresses aspects of L2 Chinese learning that have been unexamined heretofore in the areas of applied cognitive linguistics and second language acquisition (SLA).

This study employs a multi-task approach, including 80 English-speaking learners of L2 Chinese at low- and high-proficiency levels, aiming to provide thorough descriptions and analyses of the learners' interlanguage performance in describing motion events in L2 Chinese. The extant literature has revealed that learning to express motion events in an L2 is likely to involve a complex learning process influenced by L1-L2 typological differences in lexicalization patterns, lexical availability, and online habitual TFS patterns. The three different tasks adopted in this dissertation, including a picture-cued written task, an oral narrative task, and an online judgment task, were designed to elicit learners' knowledge and degree of mastery of L2 motion language, as well as to measure the different aspects of L2 TFS performance in different modalities. The picture-cued written task was developed to tap into learners' L2 competence of "thinking for writing," as participants wrote down sentences to describe various motion events shown in sets of pictures. The oral narrative task was designed to explore learners' competence of "thinking for speaking" and was conducted by using a wordless picture story that showed a series of motion events. The online judgment task targeted "listening for imaging" and required learners to respond to aural motion sentences with Chinese deictic path markers *lái* 'moving toward the speaker' or *qù* 'moving away from the speaker.'

The results discussed in this dissertation illuminate areas of ease and difficulty in adjusting to L2 TFS patterns and identify what types of difficulties L2 Chinese learners typically encounter when learning to express motion events.

1.3 Overview of the Dissertation

This dissertation comprises eight chapters. Following the introduction, Chapter 2 offers a detailed review and discussion of the theoretical framework for research on linguistic expressions involving motion events, including both L1 and L2 crosslinguistic work. Turning to the facts of the Chinese language, Chapter 3 introduces the lexicalization patterns and discourse characteristics of Chinese and discusses its typological characteristics vis-à-vis motion events, including a review of extant studies on L2 acquisition of Chinese motion expressions. Chapter 4 describes the three tasks in detail and elaborates on the procedure for the entire study. From Chapters 5 to 7, each chapter respectively presents the results of the three tasks. Specifically, Chapter 5 explores learners' abilities to use Chinese motion constructions at the sentence level by examining written production data, elicited from the picture-cued written task. Chapter 6 discusses the results of the oral narrative task and focuses on learners' structural and discourse-level use of motion expressions. Chapter 7, drawing from the results of the online judgment task, probes the extent to which L2 learners construct perceptual simulations of motion events when comprehending sentences. Finally, Chapter 8 draws conclusions from this study and offers suggestions for future research.

CHAPTER 2 THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Expressing Motion Events: A Cognitive Linguistic Framework

Motion is a universal cognitive domain that represents one of the earliest, most basic, and most pervasive understandings of events in our lives (Johnson, 1987). Motion events typically involve an entity's change of location from one place to another and can be subdivided into two kinds: self-initiated motion (e.g., *walk to school*, *climb up on the rock*) and caused motion (e.g., *take out a book*, *pull out a chair*) (see Berman & Slobin, 1994; Cadierno, 2004; Chu, 2004; Chen, 2007; Chen & Guo, 2009; Talmy, 2000; Slobin, 1996b). According to Talmy (2000, pp. 25-26), a motion event consists of four internal semantic components (i.e., Motion, Figure, Ground, and Path), which can optionally be associated with two external components (i.e., Manner and Cause):

Motion: the presence of motion *per se*
Figure: the moving, or conceptually movable, entity
Ground: the stationary reference object with respect to which the figure moves
Path: the course or trajectory of the movement
Manner: the way in which motion takes place
Cause: the cause due to which the figure moves

These components are illustrated in examples (1a), a self-initiated motion event, and in (1b), a caused motion event.

- (1) a. *The boy ran into the room.*
Figure Motion+Manner Path Ground

- b. *The girl threw the toy into the room.*
 Motion+Cause Figure Path Ground

In example (1a), the movement is initiated by the voluntary agent *the boy*, and *the boy* is the moving figure. The main verb *run* conflates the components of motion and manner. In example (1b), the movement of *the toy* is caused by an external force *the girl*. *The toy* is the moving figure of this caused motion event, and the verb *threw* encodes both motion and cause. English uses the same set of linguistic devices to encode path in both self-initiated and caused motions (cf. Choi & Bowerman, 1991; Choi & Lantolf, 2008).¹ As we can see in both (1a) and (1b), the verb particle (VP) *into* encodes the path information. Slobin (2004) specifies that path components comprise: a) direction of the motion, such as *into* in these two examples; b) deixis or direction with regard to viewpoint of the speaker; or c) contour, such as zigzag or curved. As for the ground component, *the room* in both examples is the goal, serving as a stationary reference point with respect to which we know where the two figures moved. Ground elements can be source, medium (i.e. the avenue), milestone (i.e., a monument passed along the path), or goal of the movement (Talmy, 2000, Slobin, 1997, 2004). Ground is usually encoded by a nominal, but sometimes can be encoded by other constituents. In English, for example, ground can be encoded by adverbials as well, as in the sentence *he drove home*, where the adverbial *home* denotes the goal. In another example, *he*

¹ English does not distinguish between self-initiated and caused motion in terms of path encoding, but Korean has two distinct lexicalization patterns for each type of motion (Choi & Bowerman, 1991; Choi & Lantolf, 2008).

walked uphill, the ground element *hill* denotes a medium or a goal, depending on how one construes this motion event. The ground elements are by themselves part of the path trajectory. As illustrated by Langacker's (1987, 1991) discussion of construal, a speaker can subjectively decide what aspects of a situation he or she selects to portray. Individuals may choose to profile different points of the trajectory when describing the path of a motion event. Moreover, the aspects of a motion event that appear to be salient for a speaker are highly associated with the type of language one speaks, although they could also vary due to individuals' different perspectives. Slobin (2003) has observed that speakers of different language types habitually attend to different aspects of the same motion event in a systematic manner. The typology of motion events that Slobin's work draws from is based on Talmy's famous binary typology of motion event expressions (Talmy, 1985, 1991, 2000).

2.1.1 Talmy's Typology of Motion Event Expressions

Analyzing the lexicalization patterns that different languages adopt to encode the core path component, Talmy (1985, 1991, 2000) contends that languages can be divided into a binary classification of S-languages and V-languages. S-languages, such as English and Chinese, characteristically conflate motion and manner/cause in the main verb and encode path of movement in a satellite² attached to the main verb. By contrast, V-languages like

² Talmy (2000, p. 102) notes that a closed set of forms, functioning as satellites, can in certain languages carry other grammatical functions. For instance, some English VPs such as *off*, *from*, and *toward* also function as prepositions, but other particles such as *apart* and *forth* serve only as satellites. Likewise, Chinese verb complements act as satellites, but their functions often overlap with those of main verbs (see Section 3.1.2 for a detailed discussion).

Spanish and other Romance languages typically encode path in the main verb. Moreover, V-languages tend to encode manner or cause of a motion outside of the main verb, typically as an adverbial or a gerundive type of constituent. Consider the following examples:³

(2) *Satellite-Framed Language (S-language)*

a. English

<i>An owl</i>	<i>flew</i>	<i>out.</i>
Figure	Motion+Manner	Path

b. Chinese

貓頭鷹	飛	出來	了。
<i>Māotóuyīng</i>	<i>fēi</i>	<i>chū-lái</i>	<i>le</i>
owl	fly	out-hither	Perf.
Figure	Motion+Manner	Path	

(3) *Verb-Framed Language (V-language)*

a. Spanish

<i>Salió</i>	<i>un buho.</i>
exited	an owl
Motion+ Path	Figure

As shown in examples (2a) and (2b), in S-languages, the path component is encoded in a satellite, namely, *out* in English and *chū-lái* in Chinese, while manner and motion are conveyed via the main verb. The English VP *out* and the Chinese directional complement *chū-lái* ‘out-hither’ each relate to the main verb as “a dependent to a head,” according to

³ The English and Spanish examples from Slobin (2004, p. 63).

Talmy (2000, p. 102), and thus they are typical examples of path satellites. In contrast, Spanish, a V-language, conflates the core path component together with motion in the main verb *salió* ‘exited.’ Talmy (2000, p. 27) emphasizes that this binary classification of motion languages is drawn from the most *characteristic* modes for expression of motion in a given language. The defining criteria for such “characteristic” mode of expression include that the typological principles described should be colloquial in style, frequent in occurrence, and pervasive in its ability to explain underlying semantic notions. Slobin’s work has provided empirical support for this typological analysis.

2.1.2 Slobin’s L1 Crosslinguistic Studies of Motion Expressions

In light of Talmy’s typology of motion event expressions, Slobin (1996a, 1996b, 1997, 1998, 2000, 2003, 2004, 2006) conducted a series of studies to analyze the preferred rhetorical and discourse structures used by speakers of the two types of languages. The main source of his data was oral narrations collected for Berman and Slobin’s (1994) crosslinguistic and developmental study. These narrations were produced by speakers of different language types, including both S-languages (English and German) and V-languages (Hebrew, Spanish, and Turkish). After reading Mayer’s (1969) wordless picture book, *Frog, where are you?*, the participants, sampled from five age groups (3 yrs, 4 yrs, 5 yrs, 9 yrs, and adult), were asked to retell the story depicted in the book. Analyses of the narrations identified several distinct typological patterns between S- and V-speakers, by which speakers

of S-languages used a greater variety of motion verbs and provided more information regarding manner than did speakers of V-languages. In addition, speakers of S-languages demonstrated a higher degree of elaboration in their descriptions of path of motion than did speakers of V-languages. Specifically, speakers of S-languages tended to specify details concerning the moving figures along the paths while leaving the static settings to be inferred, whereas speakers of V-languages tended to describe the static scenes in which the movement took place, while leaving the paths of the figures to be inferred. These distinctive typological preferences could be observed as early as 3 years of age.

Slobin (1997, 2004) further examined the stylistic differences between typologically different languages by comparing parallel translations of contemporary novels. The contrast in how languages of the two types frame the path is clearly shown in examples below (from Slobin, 1997, pp. 439-440):

(4) a. English original (from *The Hobbit*, Tolkien, 1937, p. 67)

*He still wandered **on**, **out** of the little high valley, **over** its edge, and **down** the slopes beyond...*

b. French translation (from Ledoux, 1980, p. 47)

Il continua d'avancer au hasard, sortit du haut vallon, en franchit le bord et descendit la pente au-delà.

'He continued to **advance** haphazardly, **exited** from the high small valley, **crossed** the edge of it, and **descended** the slope beyond.'

As illustrated in Tolkien's work, the original English writing tends to compact several path components in a single clause and then accumulate a series of ground elements by using

the same predicate *wander*. When a translator rendered the English text in French, a V-language, the path information that was originally framed in satellites was packed into verbs. It was not an option for the French translator to link multiple path and ground elements by utilizing only one verb, due to the constraints on lexicalization patterns for the French language. Consequently, the ratio of ground elements per clause in V-languages is significantly lower than that in S-languages. Slobin (1997, 2003, 2004) has observed that texts in V-languages are characterized by the occurrence of relatively fewer ground elements per verb, and that comparable motion events are described with fewer path segments in V-languages than in S-languages.

The rhetorical and structural distinctions between typologically different languages summarized by Slobin have also been attested in studies conducted by other researchers (e.g., French vs. English by Hickman, 2006; and English vs. Korean by Oh, 2009). The typological differences in lexicalization patterns between S- and V- languages not only give rise to systematic differences in narrative style, but they are also likely to play a role in online thinking, an idea captured in Slobin's think-for-speaking hypothesis, to which I now turn.

2.1.3 Slobin's Thinking-for-Speaking Hypothesis

Based on the results of his crosslinguistic analyses, Slobin (1987, 1996a, 2003) has proposed the "thinking-for-speaking (TFS) hypothesis"—a particular characterization of language-cognition interface phenomena—to account for the typological preferences he

observed. This hypothesis suggests that cognition plays a dynamic role when a speaker is within the evanescent timeframe of constructing utterances and fitting thoughts into available linguistic forms. When people construct a verbalized expression relating to their perception, the languages they speak train them to pay attention to those details of given events that are “relevant and codable” in their languages. That is, people’s experiences of the world are not only filtered into verbalized events through the choice of an individual’s perspective, but also through the particular set of linguistic options provided by the language that the individual speaks. Such online processes vary considerably from language to language and can be observed in all forms of linguistic production and reception (i.e., *thinking for speaking/writing* and *listening/reading for understanding*), as well as a range of mental processes, such as translation and mental imagery (Slobin, 2000, 2003; see also Oh, 2003). In acquiring a native language, a child learns to attend to dimensions of experience in a language-specific way while formulating and interpreting verbal messages. The TFS hypothesis, thus, is a moderate version of the Sapir-Whorf hypothesis (Sapir, 1921; Whorf, 1956), as it explains why speakers of S-languages were observed to have different online thinking patterns for speech as compared to those of V-languages.

The TFS hypothesis has attracted substantial L1 and L2 research in recent years and has been empirically tested by studies that employ different methodologies. Slobin (2000) himself, for example, conducted an experiment inspecting whether there are major

differences in mental imagery between speakers of the two types. He asked English and Spanish speakers to report mental imagery for the protagonist's manner of movement after they read the same passages (English speakers were given literal translation of the Spanish texts). It was found that almost all English speakers reported mental imagery for the protagonist's manner of movement by using a variety of manner verbs⁴ and alternative elaborated descriptions of the manner. As predicted by the TFS hypothesis, only a handful of Spanish speakers provided such reports. Most of the Spanish speakers reported little or no imagery of the manner of the protagonist's movement. This phenomenon demonstrates that the conceptualizations evoked by the same narration differ between speakers of the two types, reflecting the effects of different habitual TFS associated with motion language processing. Slobin (2003) refers to this kind of language-imagery interface as "reading/listening for imaging," a mode of TFS phenomena. Similar findings were observed in Oh (2003), who found that English speakers recalled more details concerning manner than did speakers of Korean, a V-language, after they watched the same video clips presenting various motion events. Additionally, the TFS hypothesis is directly supported in Papafragou et al. (2008), which used an eye-tracking paradigm to examine whether speakers of English and Greek, a V-language, differ in how they allocate their visual attention when preparing to describe motion events depicted by clip-art animations. The results demonstrated that, when the

⁴ Slobin (2004, p. 223) defines "manner" of motion as "a set of dimensions that modulate motion, including motor pattern, rate, rhythm, posture, affect, and evaluative factors."

perceivers are preparing to speak, their attention is directed to linguistically relevant event components. English-speaking perceivers tended to first inspect the manner region, while Greek-speaking perceivers looked at the path endpoint. This pattern of first-look analysis between speakers of the two types demonstrated language-dependent preferences according to what motion information is encoded in the verb. Papafragou et al. (2008) also pointed out that they found that such language-specific preferences disappeared in a nonlinguistic task. Perceivers of linguistically different types attended to different event components during formulation of speech, but not during other general ordinary processes of event appreciation. That is, language shapes thought when people are formulating verbal messages, as predicted by the TFS framework, but does not largely determine how they look at the world.

Gestures are another type of phenomenon that has been used to test the effects of TFS. McNeill and colleagues (McNeill & Duncan, 2000; McNeill, 2005, 2009) suggest that gestures can provide evidence of visuospatial cognition during the online process of TFS. Hence, studying co-speech gestures can offer an enhanced window to better understand the TFS framework. McNeill and Duncan (2000) investigated speech and spontaneous co-speech gesture by asking participants to retell a story, shown in a 6-minute film, to a listener who did not see the film. They found that English speakers focused their path gestures on satellites or ground nouns, and their imagery of path or direction was often broken into straight-line segments. By contrast, Spanish speakers focused their path gestures on path verbs or ground

nouns, and path information was often conveyed as a single unbroken whole without segmentation. These different uses of gestures parallel Talmy's classification and Slobin's analyses. In addition, studying development of speech and gesture of children and adults crosslinguistically, Özyürek et al. (2008) also found that children's co-speech gestures gradually shifted in a language-specific manner, as did those of adults of the same linguistic type. McNeill (2005, 2009) claimed that gestures are an integral component of language, which provides a source to look into the underlying cognitive processes that may not be obvious from speech alone.

2.1.4 Imagery in Motion Language Processing: Testing TFS Effects

Another method that has been used to study processing of motion language is behavioral experiments designed to elicit effects due to mental simulation, that is, the (re)activation of neural patterns corresponding to perceptual or motor experiences, which are grounded in a variety of experiential domains, including cognitive, physiological, biological, and cultural (cf. Bergen, 2007). Simulation-based theories of language processing claim that understanding language involves performing mental simulations related to the content of the utterance (Barsalou, 1999; Bergen et al., 2007; Bergen, Chang, & Narayan, 2004; Bergen, Narayan, & Feldman, 2003; Stanfield & Zwaan, 2001; Winawer, Huk, & Boroditsky, 2010; Zwaan et al., 2002; Zwaan et al., 2004). Simulations evoked by linguistic input can reflect universally-shared human experiences, as well as language-specific differences in patterns of

imagery (Bergen, 2007; Zwaan, 1999). Such differences in the construction of mental simulations can be illustrated by the following two scenarios, involving boiling water and chewing betel nuts. Most people are familiar with the perceptual experience of seeing and hearing boiling water. When hearing the sentence, *The water on the stove is boiling*, people unconsciously run a simulation depicting the heat, vapor, or bubbles rising from the bottom of the pot. However, some experiences can be specific to languages, cultures, and individuals. For instance, upon hearing the sentence, *Chewing betel nuts brought him a burning sensation and made his teeth and mouth bloody red*, the mental representation evoked by this linguistic input can vary profoundly, depending on whether one has had the experience of chewing betel nuts or has seen other people do so, or whether one has other factual knowledge of betel nuts. For example, a mouth cancer expert may have a simulation with more details concerning the medical effects of betel nut chewing, which would be unlikely to take place for people who lack such knowledge or relevant experience. Given that mental simulations are specific to languages, cultures, and individuals, the typologically different TFS patterns observed between speakers of S-languages and V-languages are likely to be implicated in the existence of different simulation patterns between such two types of speakers.

A number of studies have shown that visual imagery/simulation of the content of linguistic input is automatically and unconsciously activated during language processing (Bergen, Chang, & Narayan, 2004; Bergen, Narayan, & Feldman, 2003; Stanfield & Zwaan,

2001; Winawer, Huk, & Boroditsky, 2010; Zwaan et al., 2002; Zwaan et al., 2004). Studies using neuroimaging technology, such as Positron Emission Tomography (PET) and functional Magnetic Resonance Imaging (fMRI), have provided direct convergent evidence concerning the localization of simulation (e.g., Shergill et al., 2002; Wheeler, Petersen, & Buckner, 2000; Wu, Morganti, & Chatterjee, 2008). In these studies, it was observed that mental simulation for an utterance uses the same neural circuitry as those activated when one actually perceives or performs the action named in the utterance. That is, when a language user runs a simulation in understanding a motion sentence like *Throw the ball to me*, the neural motor structures responsible for the action of throwing a ball will be activated. If a short time after hearing the sentence the language user is subsequently asked to actually perform an action that uses the same muscles as throwing a ball would require, he or she will be able to do so more quickly, since the brain structures have been activated earlier when processing the sentence. Facilitation and interference effects that arise from interaction of linguistic processing and performance of actions or perception of percepts are phenomena that have been widely examined by the aforementioned researchers.

Two kinds of behavioral predictions are commonly made in simulation-based approaches: compatibility effects and interference effects (Bergen, 2007). The distinction between these two effects lies in the timing of the presentation of stimuli.

Compatibility effects are expected when the presentation of the sentence and a corresponding image/action *do not overlap* temporally, and the presentation of the sentence appears before the image or action. In such a design, the simulation that occurs while processing the preceding sentence facilitates the response in the following task if the image or action matches the sentence in terms of orientation, shape, etc. Such a facilitation effect occurs because the neural regions responsible for comprehending the content of the sentence are activated and, thus, the linguistic processing primes the activation of the same neural regions when used for the subsequent compatible task. Zwaan et al. (2004) used an experimental method designed to elicit compatibility effects. Participants first heard a sentence describing the motion of a ball toward or away from the listener (e.g., Toward condition: *The shortstop hurled the softball at you*; Away condition: *You hurled the softball at the shortstop.*). They then saw pictures of objects presented in a smaller-bigger sequence (suggesting movement toward) or a bigger-smaller sequence (suggesting movement away) and decided whether the two pictures displayed the same object. A compatibility effect was observed whereby participants responded more quickly to visual stimuli that matched the direction of movement described in the sentence they had heard, showing that the participants constructed a visual simulation during sentence comprehension.

The second kind of behavioral prediction is that of an interference effect. When the presentation of the sentence and the image/action *overlap* temporally, or the presentation of

the sentence appears after the image or action, interference effects between the two tasks can be expected. In contrast to compatibility effects, the simultaneous presentation of the sentence and the image/action requires the same neural structures process multiple tasks simultaneously, and thus processing is slowed for the two tasks. Kaschak et al. (2005) is an example of a method that was designed to elicit interference effects. Participants were asked to decide whether the sentence they heard was meaningful or not while simultaneously watching a visual presentation of motion. The critical sentences described events involving movement in one of the four directions (up, down, toward, or away), such as *The car approached you* (toward condition) or *The car left you in the dust* (away condition), and the visual presentation also depicted one of the four directions. It was found that participants took longer to decide on the meaningfulness of the sentence when the visual stimulus and the sentence both involved motion in the same direction.

We can infer from these results that perceiving motion in one particular direction engages neurons that respond to motion in that direction. When these neurons are recruited for processing a visual stimulus, they are less available for constructing a simulation required for comprehending the sentence, which thus results in an interference effect. The results of such studies demonstrate the high degree of specificity in how the perceptual mechanisms are recruited for simulation during language processing. Kaschak et al. (2005) supported the prediction of interference effects and further confirmed that spatial imagery is specific to the

directional axes of toward-away and up-down (see also Richardson et al., 2003, and Stanfield & Zwaan, 2001).

Simulation-based approaches to language processing offer a good avenue for investigating the relationship between language and thought, and are especially effective in capturing the dynamic changes of simulations evoked while processing path information. Although to date there has not been any study that has used simulation-based methods to test the TFS hypothesis, motion language has been the target domain for studying different aspects of simulation phenomena. It would therefore be desirable to employ simulation-based experimental methods to examine the crosslinguistic relativistic effects of motion event typology as proposed in the TFS framework. Speakers of typologically different languages construct different mental representations of motion events and have different TFS patterns when producing and comprehending motion language (e.g., Oh, 2003; Papafragou et al., 2008; Slobin, 2003). Slobin (2003) himself has referred to this kind of language-imagery interface as “reading/listening for imaging,” a mode of TFS phenomena. According to the simulation-based view of language processing, such typological differences would cause differences in simulation patterns during online processing of motion language. Thus, adopting the cutting-edge methods developed in simulation-based research could provide data for fine-grained analysis of the online processes of TFS effects.

2.2 L2 Acquisition of Motion Event Expressions

2.2.1 Rethinking for Speaking and Conceptual Transfer and Change in L2 Acquisition

Slobin's TFS framework is concerned with the phenomena of language-specific patterns of conceptualization, which can be applied in a wide range of domains, such as temporal encoding, deixis, spatial frame of reference, or motion (Slobin, 2003). These conceptual domains are often construed in different ways across languages, and have been widely investigated. For L2 researchers, the research question of interest is to what degree the TFS patterns established during L1 child development play a role during adult L2 acquisition.

Slobin (1993, 1996a) suggested that the TFS patterns developed in L1 acquisition might be resistant to restructuring in L2 acquisition, especially for adult L2 learners. Robinson and Ellis (2008) have characterized the development of L2 competence in expressing motion events as one of "rethinking for speaking." Building on this, Odlin (2008) and Jarvis and Pavlenkon (2008) define the crosslinguistic influence that involves linguistic relativistic effects as a kind of "conceptual transfer." According to Jarvis and Pavlenkon (2008), the lexicalized and grammaticalized concepts or preferred frames of an L1 can sensitize the speakers to specific distinctions and facilitate categorization and comprehension along the lines of their L1 habitual modes of thought. Consequently, when learning a new language, they would need to restructure their existing conceptual representations and learn to conceptualize the world in a different way when speaking and comprehending, such as

when attending to new ways of categorizing objects, events, and phenomena or making new attributions to familiar objects, or when learning the new grammatical gender of a noun.

Jarvis and Pavlenkon (2008) claim that conceptual changes in the course of L2 acquisition should be regarded as dynamic and ongoing processes, in which contributing factors including degree of linguistic transparency in concept encoding, concept salience, participation in communicative practices, and learner's agency may all play a role in shaping such processes. For example, linguistic transparency may determine the ease or difficulty of L2 TFS development in a certain domain. Taking the English concept of collective noun versus the use of the plural marker '-s' as an example, for L2 learners, learning the distinction between the usage of *dog* and *dogs* is conceptually more transparent than learning the distinction between the senses of "one larger entity" and "a group of individuals" denoted by the collective noun *family*. The single form *family* can refer to one larger entity as in *Her family is poor*, and at the same time can also be used to denote a group of individuals as in *My family are all here*. Such differences present a case of conceptual complexity, which could be more obscure than learning to use the plural marker '-s' and thus require a longer time for L2 learners to internalize the concepts of collective nouns. As for the factor of concept salience, it often has to do with the frequency with which the L2 new lexicalized and grammaticalized concept occurs. A good example of this phenomenon is how, when learning to use different classifiers in L2 Chinese, English learners are very likely to first acquire and

then overgeneralize the common classifier 個 *ge*. Chinese uses classifiers to categorize the referent of a noun, and different types of nouns are usually associated with specific measure words. 個 *ge* when used as a common classifier can sometimes function as a substitute for other specific classifiers. Hence, 個 *ge* frequently appears with different nouns and is more salient than other specific classifiers. As a result, it is often seen that 個 *ge* is the classifier that is acquired earlier than the other classifiers by L2 Chinese learners whose L1 does not have a classifier system. A third factor highlighted by Jarvis and Pavlenkon (2008) is participation in communicative practices. They suggest that the processes of conceptual restructuring cannot easily take place through decontextualized learning activities or explicit explanations. Instead, it relies on prolonged L2 exposure and extensive interaction in a variety of contexts with members of the L2 community, in order to cultivate the ability to make spontaneous distinctions that are not otherwise made in learners' L1 and to pay spontaneous attention to L2-specific perspective. Finally, learners' agency in deciding to what extent they are willing to accept L2-mediated concepts or values may also have an impact on such processes of conceptual change.

Despite the increasing number of studies that look into the issues relevant to TFS, the extent to which L1 TFS patterns influence L2 acquisition, and whether L2 learners can shift toward new L2 patterns, remain to be answered empirically. It is possible that L1-based ways of TFS could persist into adult use of the L2. Alternatively, it could instead be possible that

adult L2 learners may be able to adjust and conform to new L2 TFS patterns through instruction or interaction in natural contexts. In other words, it may be possible, through instruction, to guide learners in refiltering their experiences of motion events and to reallocate their attentional resources while using their L2 to describe motion events. Alternatively, L2 learners may gradually develop their awareness of conceptual differences between their native language and the target L2 through L2 exposure and use, whereby they may modify existing concepts and incorporate new ones. As noted by Robinson and Ellis (2008), L2 studies on motion events have produced findings that offer a foundation for future L2 research that could explore crosslinguistic influences among language, thought, and L2 development. Although L2 research on motion event expressions is still in its infancy, the existing studies have demonstrated fruitful attempts to apply the concepts and theories of cognitive linguistics to L2 research. In these studies, language is no longer regarded as an autonomous module within the mind but, rather, a complex system that arises from highly interactive relationships among various other cognitive faculties, including vision, memory, sensory areas, and motor areas.

2.2.2 L2 Research on Acquisition of Motion Event Expressions

In light of Talmy's typology of motion event expressions, as well as Slobin's TFS framework, a few L2 studies have begun to explore whether L2 learners are able to adjust to new TFS patterns when their L2 is typologically different from their L1. Two methods have

been used in such studies to date. The first line of research focuses on analysis of elicited narratives, comparison of the L1-L2 performance by the learners, and delineation of differences between the learners and NSs.

The results of this line of research showed evidence of influence of L1 TFS patterns on the L2, and such influence was more prominent in intermediate learners than in advanced learners. Cadierno (2004) investigated how speakers of L1 Danish, an S-language, come to express motion events in L2 Spanish, a V-language. Sixteen Danish learners and 16 NSs of Spanish participated in this study, and the same frog story utilized in Berman and Slobin (1994) was again used to elicit written narratives. The results showed that, compared to the written narratives produced from the Spanish NSs, intermediate L2 Spanish learners exhibited a higher degree of complexity and elaboration of paths of motion in their interlanguage production through the use of redundant and anomalous path particles as well as unnecessary ground adjuncts. This phenomenon has been referred to as “satellization” of L2 Spanish motion constructions (Cadierno, 2004), which is parallel to the learners’ L1 Danish production. This suggests that learners’ L1 TFS patterns influence their acquisition of a typologically different L2 (see also Navarro & Nicoladis, 2005). Moreover, in a subsequent study, Cadierno (2010) recruited three groups of low intermediate learners of L2 Danish, an S-language, with typologically similar or different L1s and a comparison group of L1 Danish speakers to further explore the influence of L1 TFS on L2 acquisition of motion expressions.

The three learner groups (total N= 36, 12 per group) included two groups of L1 S-language speakers, German and Russian, and one group of L1 V-language speakers, Spanish.

Comparison of the three learner groups' L2 Danish production showed that the L1 S-language learners produced more target-like motion constructions, and that they used a wider variety of manner verbs, than the L1 V-language learners did. These results indicate that learners whose L1 are typologically different from the target L2 are likely to have more difficulty learning L2 motion expressions than those whose L1 are typologically similar.

On the other hand, learners' L2 proficiency level also seems to play a role in the development of L2 TFS. Cadierno and Ruiz (2006) observed that advanced-level learners were readier to adjust to L2 TFS patterns in their descriptions of motion events, suggesting a limited role for L1 TFS patterns in advanced L2 acquisition. In agreement with Cadierno and Ruiz (2006), Navarro and Nicoladis (2005) analyzed oral narratives produced by L1 English learners of L2 Spanish. They also concluded that, although the learners' L2 Spanish production showed tendencies of L1 influence, there was more evidence to indicate that the proficient L2 Spanish learners were attuned to the L2 patterns. Cadierno (2008) further comments that learning another way of TFS involves at least: a) learning which particular aspects of a motion event must be attended to in the input and expressed in the L2; and b) learning how semantic components, such as manner, path and ground, are characteristically mapped onto L2 surface forms.

In light of the L1 work on speech and co-speech gestures by McNeill and Duncan (2000), the second line of L2 research on motion events concentrates on comparing L1-L2 speech and spontaneous co-speech gestures. These data were generally elicited by asking participants to retell a narrative after watching a video or reading a story. Similar to the studies using elicited narratives, NSs' production was taken as baseline data for crosslinguistic comparison between the L1 and L2. The gesture studies examined not only learners' explicit speech production but also the accompanying gestures, which can reveal additional information about learners' underlying mental representations of motion events.

The results of the extant gesture studies generally showed that L2 learners relied on their L1 TFS patterns in their L2 thinking. Stam (2006) examined the use of path in speech and gestures by five Spanish NSs and five English NSs. These baseline data were compared with the use of L2 English by L1 Spanish learners at two proficiency levels (5 intermediate and 5 advanced). Analyses of the speech-gesture patterns showed that the learners' speech-gesture patterns did not completely pattern with those of either the L1 or L2. Unlike the patterns used by English NSs, the learners failed to accumulate path components in a single clause. They still conformed to L1 Spanish TFS patterns, tending to narrate each path component in a separate clause. Additionally, a large percentage of the path gestures produced by the advanced L2 learners co-occurred with verbs rather than with satellites, indicating that their TFS patterns were more L1-like. However, it was also observed that they

sometimes accurately used path gestures that co-occurred with satellites. Stam concluded that the learners' patterns of gestures revealed that they did not think about motion in the same ways as the English NSs did, although they were still able to produce well-formed L2 utterances. Inspecting another aspect of motion expressions, Yoshioka and Kellerman (2006) focused on the L2 use of gestural introduction for ground reference by Dutch-speaking (S-language) learners of L2 Japanese (a V-language). The data were collected from 15 Japanese NSs, 12 Dutch NSs, and 15 low-intermediate Dutch learners of L2 Japanese. The results showed that the Dutch learners' rhetorical preferences for ground encoding resembled their L1 Dutch patterns more than the target L2. They tended to encode ground in association with a motion verb to describe the protagonist's movement in their L2 Japanese production, showing an S-like preference. In contrast, the Japanese NSs, like other V-language speakers, preferred to describe static scenes that implied a path and tended to use an existential construction, independently from a motion verb, to encode ground information. Hence, these learners' use of ground encoding was still closely related to their L1 TFS.

Another gesture study uncovered no evidence of shifting to L2 thinking (Choi & Lantolf, 2008), examining path and manner encodings in both self-initiated and caused motion events in speech and gesture produced by two groups of L2 learners and one group of Korean NSs. The L2 groups comprised two advanced English learners of Korean (a V-language) and two advanced Korean learners of English. The four L2 learners were

proficient in their respective L2, and they all had experience living in their target L2-speaking country for at least four years. The results also supported Slobin's (1993, 1996a) proposal that it is typically very difficult for adult L2 learners to shift their L1 TFS patterns to those of an L2. Both groups of L2 learners preferred to encode manner in a way resembling their respective L1. With regard to the use of path encoding, the L2 Korean learners did not encode the caused motion following the target grammar, in which the path and ground were supposed to be encoded together with a transitive path verb. Note that, different from English, Korean has two different lexicalization patterns distinguishing between spontaneous and caused motion events (cf. Choi & Bowerman, 1991; Choi & Lantolf, 2008). In this respect, the more complex linguistic system in the target L2 posed considerable challenges for these L2 Korean learners, whose L1 English does not have corresponding linguistic distinctions as does their L2 Korean. As for the L2 English learners, it was also found that they were not as sensitive to manner of motion in their L2 narration, differing from the L1 English TFS patterns. Choi and Lantolf (2008) concluded that the L2 learners in both groups preferred to retain their L1 TFS patterns in their L2 speech-gesture production, despite their high level of proficiency in their respective L2s.

Overall, these gesture studies indicate that the L2 learners did not fully acquire the L2 TFS patterns for expression of motion events. Moreover, research looking into the learners' gesture production has revealed certain aspects of TFS phenomena that were not clear by

analyzing speech data alone. As demonstrated in Stam (2006) and Choi and Lantolf (2008), L2 learners sometimes may be able to produce target-like manner/path encodings in their utterances, while their gesture production may still reflect L1-like patterns. Therefore, to determine whether an L2 learner has truly adapted to new L2 TFS patterns, research would need to examine both the overt linguistic production and the other implicit modes that provide means for exploring learners' underlying conceptual representations of motions.

While most L2 speech-gesture studies have reported signs of L1 TFS influence on L2 motion expressions, a recent experiment by Brown and Gullberg (2008) reported evidence of bidirectional transfer indicating parallel influences of the L1 TFS on the L2 and the L2 TFS on the L1. They examined the L1-L2 use of manner encoding in speech and gesture produced by 28 L1 Japanese speakers (a V-language) with intermediate proficiency in L2 English and compared their production with that of 16 monolingual Japanese speakers and 13 English monolingual speakers. Analyses of the L1 Japanese and L2 English production from the Japanese-English bilingual speakers demonstrated L1 Japanese-like preferences in their L2 English encoding of manner in speech and gesture, suggesting influences of the L1 TFS on L2 production. However, it was also observed that the Japanese learners distributed information about manner across speech and gesture in a manner that differed from the monolingual Japanese speakers, showing that acquisition of a typologically different L2 can also change the conceptualization of manner of motion, even for the L1. Brown and Gullberg

(2008) suggested that such bidirectional crosslinguistic interactions between the learners' L1 and L2 were prompted by the dynamics of bilingual processing. L1-L2 interactions can occur even in bilingual speakers who have only intermediate proficiency in the L2. The study by Brown and Gullberg (2008) demonstrates that adaptation to new L2 TFS patterns does not come easily and opens up the possibility that conceptual attrition of the L1 (Jarvis & Pavlenkon, 2008) could occur during the course of acquiring a new conceptual system.

In sum, the extant literature on L2 acquisition of motion expressions generally points to the potential influences of L1 TFS patterns on L2. However, the extent to which L1 TFS plays a role in L2 performance may vary, depending on factors such as the L2 learners' proficiency level, modalities of presentation, aspects of motion language inspected, and the relative degree of typological differences and similarities between the target L1 and L2.

Conceptual changes in the course of L2 acquisition, as Jarvis and Pavlenkon (2008) note, are dynamic and ongoing processes in which multiple factors can play a role. Therefore, it is important to conduct a large-scale study that includes learners of different proficiency levels and measures L2 use of motion expressions in different aspects across different modalities.

Also, a greater variety of language combinations, reflecting a range of L1-L2 distances, need to be documented in order to form a complete picture. I will, therefore, turn to the target L2 the Chinese language in the next chapter, and start from its syntactic and discourse characteristics and how it differs from the target learners' L1 English.

CHAPTER 3 ENCODING MOTION EVENTS IN CHINESE

3.1 Chinese Lexicalization Patterns

3.1.1 Chinese Motion Verbs

Several categories of motion verbs can occur as the main verb in a motion construction (cf. Chen, 2007; Chen & Guo, 2009; Li & Thompson, 1981). Some inherently denote spatial displacement, while others are not necessarily associated with translational motion, unless they occur with a directional complement denoting the path of the motion. Following classification made by Özçaliskan and Slobin (2003), Table 1 presents several types of motion verbs in Chinese.

Table 1 Categories of Verbs in Chinese Motion Constructions

Verb Categories	+/- Displacement	Example
Manner Verbs	+ displacement	跑 <i>pǎo</i> ‘run,’ 走 <i>zǒu</i> ‘walk,’ 追 <i>zhuī</i> ‘catch,’ 飛 <i>fēi</i> ‘fly,’ 游 <i>yóu</i> ‘swim,’ 踢 <i>tī</i> ‘kick,’ 丟 <i>diū</i> ‘throw,’ 推 <i>tuī</i> ‘push’
Path Verbs ^a	+ displacement	來 <i>lái</i> ‘come,’ 去 <i>qù</i> ‘go,’ 上 <i>shàng</i> ‘ascend,’ 下 <i>xià</i> ‘descend,’ 起 <i>qǐ</i> ‘rise,’ 進 <i>jìn</i> ‘enter,’ 出 <i>chū</i> ‘exit,’ 回 <i>huí</i> ‘return,’ 過 <i>guò</i> ‘pass/cross’ 到 <i>dào</i> ‘arrive,’ 開 <i>kāi</i> ‘part/open’
Neutral Verbs	- displacement	站 <i>zhàn</i> ‘stand,’ 坐 <i>zuò</i> ‘sit,’ 躺 <i>tǎng</i> ‘lie,’ 抱 <i>bào</i> ‘hold,’ 拿 <i>ná</i> ‘take’

^a These path verbs can also serve as DCs indicating path or direction of motion.

As illustrated in Table 1, manner verbs and path verbs inherently imply a change of location for the figure. Intransitive manner verbs, such as 跑 *pǎo* ‘run’ or 走 *zǒu* ‘walk,’ together with the path verbs, are closely related to self-initiated motion, in which the agent itself is the moving figure. Transitive manner verbs, such as 踢 *tī* ‘kick’ or 推 *tuī* ‘push,’ are often used to denote a caused motion event, in which the movement of the figure is caused by another agent/force (Berman & Slobin, 1994; Choi & Bowerman, 1991). By contrast, neutral verbs such as 站 *zhàn* ‘stand’ or 抱 *bào* ‘hold’ do not by their nature suggest translational motion (Chen & Guo, 2009; Guo & Chen, 2009). The sense of movement is generated only when such verbs are followed by a path indicator, namely, a directional complement (DC). For the convenience of discussion, I will hereafter refer to these three categories of verbs as motion verbs.

3.1.2 Chinese Path Encoding Options

Having undergone a process of grammaticalization, a small set of Chinese path verbs has gradually developed the syntactically restricted functionality of encoding path information as DCs (Li, 1993; Peyraube, 2006; Talmy, 2000). This closed set of direction indicators is summarized in Table 2.

Table 2 DCs in Chinese

來 <i>lái</i>	‘hither’ (moving toward the speaker)
去 <i>qù</i>	‘thither’ (moving away from the speaker)
上 <i>shàng</i>	‘up’ (moving upward, profiling the goal region) ^a

下 <i>xià</i>	‘down’ (moving downward)
起 <i>qǐ</i>	‘up’ (moving upward, profiling the source region) ^a
進 <i>jìn</i>	‘into’ (moving from outside to inside)
出 <i>chū</i>	‘out’ (moving from inside to outside)
回 <i>huí</i>	‘back’ (returning to an original place)
過 <i>guò</i>	‘across’ (moving from one side to the other) ‘past’ (moving past a point) ‘over’ (moving from one point to another)
到 <i>dào</i>	‘to’ (arriving at a point)
開 <i>kāi</i>	‘apart; away’ (departing from a point)

^aThe English path satellite “*up*” is subdivided into two categories in Chinese: 上 *shàng* and 起 *qǐ* (see Section 3.4.1 for a detailed discussion).

The most characteristic mode of Chinese motion construction is: Manner/Neutral Verb + DC1 + (DC2 *lái/qù*) (cf. Chu, 2004; Chen, 2007; Chen & Guo, 2009). Chinese uses post-verbal DCs to encode the path, a strategy that is somewhat similar to English VPs (e.g., *up, down, out*). These DCs are sisters to preceding main verbs and denote merely the direction of the movement named by the main verb rather than a series of motions. For example, the motion construction 跑-進-來 *pǎo-jìn-lái* ‘run-into-hither’ refers to a single motion instead of to a series of motions (i.e., running, entering, and coming). The DCs 進-來 *jìn-lái* ‘into-hither’ denote a direction of running both into a destination location and toward the speaker. Analyzing such post-verbal path elements as DCs rather than independent verbs is a generally accepted analysis among Chinese linguists (e.g., Chao, 1968; Cheung et al., 1994; Henne, Rongen & Hansen, 1977; Liu, Pan & Gu, 1983). Talmy (1991, 2000, 2009) also

treats DCs as path satellites attached to the preceding main verb and therefore considers Chinese to be an S-language. As Peyraube (2006; see also Li, 1993) has suggested, Chinese shifted during the course of its history and, while it was once a V-language, it has now become an S-language.

However, complicating this picture is the fact that DCs can also occur as individual full verbs in contemporary Chinese (Chen, 2007; Chu, 2004; Talmy, 1991, 2000). As illustrated in example (5), the DC *chū* ‘out’ functions as a single main verb for the entire sentence.

- (5) 他 出 海關 了。
Tā chū hǎiguān le.
he **exit** customs Perf.
‘He exited the customs area.’

For sentences like (5), both path and motion are expressed in the single main verb, clearly following the pattern of V-languages. Since a DC can function not only as path indicator but also as independent verb, it straddles both sides of the classic binary dichotomy, and thus presents a counterexample against the classification of Chinese within the binary framework. To a certain degree, the dual function of such morphemes as both a complement and a full verb demonstrates that Chinese DCs are in fact structurally distinct from English path satellites (i.e., the English VPs *in, out, up, down, etc.*), presenting another case of intra-typological variation of motion event typology, which has been noted by researchers

studying other languages (e.g., Beavers, Levin, & Tham, 2010; Choi, 2009; Slobin et al., 2010).

3.1.3 Chinese Motion Constructions

While the “Manner/Neutral Verb + DC1 + (DC2 *lái/qù*)” constructions are the most characteristic mode of Chinese motion expressions, Chinese motion constructions can be categorized into four types, depending on whether or how the path component is encoded by the speaker. Table 3 summarizes the four types of motion constructions.

Table 3 Categories of Chinese motion constructions

Categories of motion construction	Example
Manner/Neutral V + DC1 + (DC2 <i>lái/qù</i>)	他 跑 進 來 了。 <i>Tā pǎo jìn lái le</i> He run into hither Perf. 'He ran in [hither].'
Manner V only	他 跑 了。 <i>Tā pǎo le</i> He run Perf. 'He ran.'
Path V only	他 進 海關 了。 <i>Tā jìn hǎiguān le.</i> He enter customs Perf. 'He entered the customs area.'
Path V + DC <i>lái/qù</i>	他 進 來 了。 <i>Tā jìn lái le.</i> He enter hither Perf. 'He entered [hither] the customs area.'

As shown in Table 3, as manner verbs inherently denote translational motion, manner verbs can appear alone without DCs. The other two types of motion constructions are cases where the set path morphemes appear as the main verbs, showing V-framed patterns. Note that the path verb may appear alone or with another post-verbal DC. Such post-verbal DC is

usually the deictic DC 來 *lái* ‘moving toward the speaker’ or 去 *qù* ‘moving away from the speaker.’

Among the four types of motion constructions, given that the same set of path morphemes are used in the “Manner/Neutral Verb +DC1 + (DC2 *lái/qù*)” constructions and the “Path Verb only” and “Path Verb+DC *lái/qù*” constructions, the “Manner/Neutral Verb + DC1 + (DC2 *lái/qù*)” constructions represent more complex constructions in terms of processing load, because they encode not only the core path component but also manner.

3.1.4 The Six Types of DC constructions

Although Chinese and English are both satellite-framed, DCs differ from English VPs in terms of the variety of DCs and the various word order patterns associated with their use. The two dimensions of variation yield a six-type classification of DC patterns that can be used to describe motion events. The linguistic facts are summarized in Table 4, following Chao (1968), Cheung et al. (1994), Liu, Pan and Gu (1983), Lu (2002), Peyraube (2006), and Yao and Liu (1997).

Table 4 The Six Types of DC Constructions

Type	Example
1. Simple DCs	他 走 到 了。 <i>Tā zǒu dào le.</i> He walk to Perf. ‘He arrived.’
2. Complex DCs	他 走 回 來 了。 <i>Tā zǒu huí lái le.</i> He walk back hither Perf. ‘He walked back [hither].’

3. Simple DCs with Object NPs	他 搬 出 了 一 張 大 桌 子 。
	<i>Tā bān chū le yì-zhāng-dà-zhuōzi.</i>
	He move out Perf. a-Cl.-large-table
	‘He moved out a large table.’
4. Simple DCs with Place NPs	他 走 回 宿 舍 了 。
	<i>Tā zǒu huí sùshè le.</i>
	He walk back dormitory Perf.
	‘He walked back to the dormitory.’
5. Complex DCs with Object NPs	他 搬 出 一 張 大 桌 子 來 了 。
	<i>Tā bān chū yì-zhāng-dà-zhuōzi lái le.</i>
	He move out a-Cl.-large-table hither Perf.
	‘He moved out a large table [hither].’
6. Complex DCs with Place NPs	他 走 回 宿 舍 來 了 。
	<i>Tā zǒu huí sùshè lái le.</i>
	He walk back dormitory hither Perf.
	‘He walked back [hither] to the dormitory.’

One criterion for the classification of DC constructions into the six types is the number of constituents and associated word order rules. Specifically, each DC type can be described by whether an NP (denoting object or place) is present or not. The choice to produce DCs with or without an accompanying NP depends on what aspects of a motion event the speaker intends to highlight. When describing a self-initiated motion event (e.g., *walk to school, climb up on the rock*), a Place NP denoting the source or goal of the motion is likely to be included, but when describing caused motion (e.g., *take out the book, pull out a chair*), an Object NP tends to be expressed. As illustrated in Table 4, DC patterns of Types (1) and (2) are plain forms without an NP, and Types (3) to (6) contain a Place or Object NP. When an NP is present, certain word order rules apply in order for the utterance to be grammatical. Specifically, if the NP denotes Place, then it must appear between DC1 and DC2 (e.g., *zǒu huí sùshè lái* ‘lit. walk-back-**dormitory**-hither’ or *chū guó qù* ‘lit.

exit-country-thither’). By contrast, the word order for an Object NP is more flexible than that for a Place NP (cf. Liu, Pan, & Gu, 1983; Yao & Liu, 1997; Po-Ching & Rimmington, 2004). For example, in the Type (5) complex DC with Object NP construction, the Object NP can be inserted between DC1 and DC2, as shown in the example in Table 4, or between the Verb and DC1 (i.e., *bān yì-zhāng-dà-zhuōzi chū lái* ‘lit. move-a-large-table-out-hither’). Alternatively, it can also occur after DC1 and DC2 (i.e., *bān chū lái yì-zhāng-dà-zhuōzi* ‘lit. move-out-hither-a-large-table’). The issue of grammatical word order becomes relevant for Types (3) through (6), since it depends on whether it is a Place NP or an Object NP that is inserted in the DC. Given the relatively more restricted word order associated with the insertion of Place NPs, the evidence for grammatical word order can be inspected in patterns of DCs with such NPs (i.e., Types 4 and 6).

The other classificatory criterion is whether there is only one DC (simple) or two DCs (complex) in the utterance. This is mostly a matter of choice, but with certain restrictions.

The first restriction is that, when a DC is complex, the second DC is always the hither/thither path⁵ denoting the figure’s deictic path or movement from the perspective of the speaker: *lái* ‘moving toward the speaker’ or *qù* ‘moving away from the speaker.’ The second restriction is

⁵ The DC 到 *dào* ‘arriving at a point’ may occasionally appear as DC2, but it does not appear as frequently as the deictic DCs and cannot be attached to different DC1 as freely as the deictic DCs. For example, Path V+DC patterns such as *出-到 *chū-dào* ‘exit-arriving a point’ or 過-到 *guò-dào* ‘cross-arriving a point,’ are not grammatical combinations. Hence, most Chinese reference or pedagogical grammars do not mention 到 *dào* as a possible DC2 when introducing complex DC patterns (e.g., Chao, 1968; Cheung et al., 1994; Liu, Pan & Gu, 1983; Lu, 2002; Peyraube, 2006; Yao & Liu, 1997). Cases involving 到 *dào* as a DC2 were excluded from discussion of the complex DC patterns in this dissertation.

that, although using a simple or complex DC type is mostly a matter of choice, there are occasions when it becomes a matter of grammaticality. Specifically, when the DC utterance is plain, that is, without an Object or Place NP, it becomes necessary to encode deictic path in the second DC for the utterance to be grammatical. For instance, to say “*he walked back*” in Chinese, one has to use the Type (2) complex DC pattern: V (走 *zǒu* ‘walk’) + DC1 (回 *huí* ‘back’) + DC2 (来 *lái* ‘hither’). Omitting the deictic DC2 *lái* would generate a non-target-like form (i.e., **Tā zǒu huí le*. ‘lit. He-walk-back-Perf.’). More generally, the encoding of deictic path is common when Chinese speakers express motion events; according to Chen (2007, p. 53), 55% of the motion event descriptions found in 59 Chinese frog stories encoded deictic paths. Lu (1984) also found in his corpus study that the Type (2) complex DC had the highest occurrence rate at 52.5% among the six types of DC patterns. Observing the frequent use of deictic path markers in Chinese frog stories, Slobin (2004) has suggested that deixis seems to be more closely tied to conceptions of path for Chinese speakers.

These corpus studies have shown that Chinese speakers have developed habitual L1 TFS for encodings of the deictic paths. Because the spatial reference implied by *lái* or *qù* constantly changes, depending on the context in which the utterances occur and the knowledge shared by interlocutors (Levelt, 1989; Garnham, 1989), such L1 TFS competence would include the ability to promptly anchor one’s utterances to the spatial environment in language production and to rapidly interpret the spatial reference denoted by deictic path

markers in language comprehension. The cultivation of such TFS could be a potential source of challenge for L2 learners whose L1 does not frequently incorporate the deictic endings.

3.2 The Place of Chinese in the Typology of Motion Event Expressions

Most Chinese linguists (e.g., Chao, 1968; Cheung et al., 1994; Henne, Rongen, & Hansen, 1977; Liu, Pan, & Gu, 1983) analyze path morphemes that appear after a manner/neutral verb as path satellites (i.e., DCs), suggesting that Chinese typically encodes path by means of an S-framed strategy. However, Slobin (2004, 2006) has proposed a third category called “equipollently-framed languages” so as to accommodate serial-verb languages, such as Chinese and Thai. He claims that equipollently-framed languages (E-languages) have both path and manner components expressed by equipollent grammatical forms. For instance, in the Chinese motion construction 跑-回-來 *pǎo-huí-lái* ‘run-back-hither,’ he analyzes *pǎo-huí-lái* ‘run-back-hither’ as a serial-verb construction, in which *huí-lái* ‘back-hither’ is not treated as a series of DCs, but as full verbs that receive equal weight with the preceding verb *pǎo* ‘run.’ As Beavers, Levin, and Tham (2010) pointed out, the proposal to categorize Chinese as an equipollently-framed language is empirically inadequate. There is no general consensus that path morphemes appearing after a manner/neutral verb should be treated as full verbs, and the languages that Slobin proposed to be categorized as E-languages also differ in terms of whether and how the deictic path component and non-deictic path are encoded. In this section, I will offer my opinions on the

issue of the typological classification of Chinese and discuss the impact of observed Chinese typological and syntactic features in L2 learning.

According to Talmy (2000), typological principles should capture the *most characteristic* modes for expression of motion in a given language. Following Talmy's proposal, statistical data on the relative frequency of the use of these path elements as satellites versus their use as full verbs in the language should reveal whether Chinese is more S-like or V-like.

Chen and Guo⁶ (2009, p. 1760, Table 4) have shown that, among self-initiated motion events expressing path information, in a corpus comprised of the full texts of nine novels written in contemporary Chinese, 75.46% of such events had their paths encoded by means of satellites, while 24.54% of them had the path encoded in a main verb. These data confirm that, in Chinese, the path information is much more frequently encoded in a satellite than in a main verb. These tendencies, observed from naturalistic language use, reveal that S-framed encoding more closely characterizes the structural patterns of contemporary Chinese than does V-framed encoding.

Moreover, the controversy concerning the classification of Chinese in the typology of motion event expressions can also be resolved by examining the structural features of

⁶ Chen and Guo (2009) followed Slobin's (2004, 2006) analysis, treating DCs as full verbs as having the same status as the preceding main verb. The percentages of DCs appearing as satellites versus as full verbs provided in my analysis were generated by regarding post-verbal path morphemes that indicate directionality as DCs rather than full verbs.

Chinese DCs. Satellites are defined as a closed class of morphemes. Such closed classes include English VPs, as well as German separable and inseparable verb prefixes, and in each of these two languages the verb roots are elements of an open class of words (Talmy, 2000). In Chinese, reference grammars list only 10 to 15 different DCs (the exact number varies slightly depending on the grammar), which obviously belong to a strictly closed class, in contrast to the open-class type of their preceding verb roots (Shen, 2003; Talmy, 2009). In this respect, the Chinese Verb-DC construction fits Talmy's typology well.

Given that path is more frequently encoded by means of satellites in Chinese, and that the features of DCs align well with the definition of satellites, it is clear that Chinese should be classified as an S-language. Chinese motion constructions *Verb + DC* are indeed similar to English motion constructions *Verb + VP* in many ways. Nonetheless, it should be recognized that Chinese motion constructions also present a case of intra-typological variation. In addition to the dual functions of DCs as path satellites and as main verbs in the language, DCs also differ from English VPs in terms of the variety of DC types that exist in Chinese and the various word order patterns associated with their use. For L2 Chinese learners whose L1 is an S-language, it could be challenging to discern such L1-L2 nuances. In other words, for L1 English learners of L2 Chinese, misleading similarities (Andersen, 1983; Wode, 1976) between English-Chinese motion expressions could lead to potential learning challenges.

3.3 Discourse Characteristics of Motion Events in L1 Chinese

Turning to the narrative styles and discourse patterns associated with Chinese motion expressions, Chen (2007) examined motion event descriptions elicited from 59 Chinese speakers using the same frog story and then compared his results to those of Slobin (1996b). Analyses of the structural and discourse patterns across languages of different typological types have shown that language-specific preferences can be attributed to interacting factors such as linguistic structure, lexical availability, or processing load (Slobin, 2004). These factors together shape the ways that speakers of one language develop particular TFS patterns. In the following sections, I examine the statistical data reported in Chen (2007) and Chen and Guo (2009) and discuss implications of their findings.

3.3.1 Use of Manner Verbs

Using a type/token analysis of verbs that occurred in motion constructions, Chen (2007) observed that Chinese speakers use a variety of motion verbs, and that they favor the use of manner verbs (72%, or 45 types of manner verbs, out of 63 total types of motion verbs). This tendency is parallel with patterns observed in English (see Slobin, 1996b), in which 74% of the motion verbs supplied are manner verbs (35 types of manner verbs out of 47 types of motion verbs). In contrast, for Spanish only 41% of the motion verbs are manner verbs (11 out of 27 types). Drawing from analysis of motion event across different languages, Slobin (2004) has suggested that narrative variations in motion event descriptions can result from the

combined influences of linguistic structure, lexical availability, online processing, and cultural practices. In terms of lexical availability, Chinese and English each have a large set of motion verbs, many of which conflate manner and motion. Hence, comparatively more diverse lexica of manner verbs are found in English and Chinese. By contrast, expressing manner of motion in Spanish requires the use of an adverbial or gerundive type of constituent. Consequently, the elaboration of manner is more of a luxury in V-languages. Slobin (1996, 2004) found that, although it is possible to express manner by using an adverbial or a gerundive type of constituent, no Spanish narrator chose to use patterns like the English quasi-serial verb “*exit flying*.” He suggested that such avoidance can be explained on account of ease of processing, since supplying the manner descriptions in Spanish would unnecessarily foreground the manner, thus causing an unnecessary burden during processing.

Although Chinese generally patterns with English in that manner verbs account for the largest portion of the motion verb types used, research has shown that the manner verb lexicon in Chinese may be less versatile than that in English (cf. Chu, 2004; Chen, 2007; Chen & Guo, 2009). Using a different dataset from the elicited oral narratives analyzed in Chen (2007), Chen and Guo (2009) examined descriptions of motion events in nine Chinese novels and compared their findings with those reported in Özçaliskan and Slobin (2003), in which a selection of 18 contemporary novels (nine in English and nine in Turkish) were inspected. A total of 64 manner verb types (53% of all motion verb types) were used in

English, 41 used in Chinese (45.3% of all motion verb types), and 26 used in Turkish (a V-language, 34% of all motion verb types). The results suggest that Chinese manner verbs are less rich in comparison to English manner verbs (see also Chu, 2004), although the size of manner verb lexicon in Chinese is still significantly larger than that in other V-languages.

3.3.2 Descriptions of Consecutive Motions

Concerning another aspect of descriptions of motion events, Chen (2007) identified that Chinese speakers tend to break up a complex motion event into several event segments and mention what takes place step by step, which also patterns with S-language speakers. When describing the complex series of motions depicted in the deer scene of the frog story, 92% of the adult narrators mentioned at least three event segments of the scene, and the average number of event segments was 3.5, even higher than that of typical S-languages at 3.0, compared with that of V-languages at 2.1 (Slobin, 1997). In this regard, Chinese narrators behave more similarly to narrators of S-languages than those of V-languages.

Nevertheless, there is an obvious intra-typological variation between Chinese and English in terms of the number of path components supplied in a single sentence. Chinese narrators do not pack a number of path components into a single clause as do English narrators. The properties of English motion constructions make it possible to attach several path satellites to a single main verb, linking both source and goal in a single clause, such that a sentence like “*the deer threw him **off over** a cliff **into** the water*” can be produced (example

from Berman & Slobin, 1994, p. 118). However, the syntax of Chinese motion constructions does not allow such path encodings. When Chinese narrators are describing a series of linked paths, taking Slobin's example "the boy fell *from* the cliff *down into* the water" as an example, they tend to use more than one "Verb + DC pattern" to describe the complex motions. If one tries to translate this compact sentence into Chinese literally, keeping each of the equivalent lexical elements from the English sentence, one is likely to generate two clauses, with the *Verb + DC* structure used separately in each of the clauses, as shown in (6):

- (6) 小 男孩 從 峭壁上 掉 下 去
Xiǎo nánhái cóng qiàobì-shàng diào xià qù,
 Little boy from cliff-top **fall down hither**
- 掉 進 水塘裡
diào jìn shuǐtáng-lǐ.
fall into pond-inside

In (6), a Type 2 complex DC pattern, *diào-xià-qù* 'fall-down-into,' is used the first clause, and another Type 4 simple DC with Place NP pattern, *diào-jìn-shuǐtáng-lǐ* 'fall-into-pond-inside' is used in the second clause. The tendency to use only one DC construction per clause demonstrates that Chinese DCs cannot be detached from the main verb, nor further combined with other complements, as freely as English VPs are. Consequently, the number of path components in a Chinese clause tends to be limited to either one (as in simple DCs) or two (as in Complex DCs). This structural feature also

influences the number of ground elements encoded per clause. As shown in the second motion clause in (6), the syntax of Chinese motion constructions generally allows either encoding of one ground element (i.e., *shuǐtáng-lǐ* ‘pond-inside’) or no ground encoding, as in the Type 2 complex DC pattern in the first clause. Note that other means aside from the use of DC patterns may add extra ground elements in a Chinese motion clause. For example, in the first clause of example (6), use of the preposition *cóng* ‘from’ introduces the source *qiàobì-shàng* ‘cliff-top,’ which therefore adds one ground element in this clause.

3.3.3 Encodings of Ground Elements

Thus far, analyses of the discourse features of Chinese narratives show that Chinese speakers generally pattern with S-language speakers and sometimes show areas of intra-typological variation. Regarding their use of ground elements, Chinese speakers demonstrate a strong V-framed tendency (Chen, 2007). For example, minus-ground clauses account for 18% of the motion clauses elicited for English, 37% for Spanish, and 48% for Chinese. The higher percentage of minus-ground clauses for Chinese means that Chinese narrators tend to leave out the ground information about half of the time when describing motion events. Although not discussed in Chen’s study, there could be a close relation between the encoding of ground elements and deictic paths. When a ground element is encoded, there seems to be a higher chance that the encoding of a deictic path will be omitted. This could be attributed to the general factor of limited processing capacity. As indicated by

Slobin (2003), “An event cannot be fully represented in language: linguistic expression requires schematization of some sort. Every utterance represents a selection of characteristics, leaving it to the receiver to fill in details on the basis of ongoing context or background knowledge” (p. 158). Ground elements and deictic paths both provide information about the reference points on the trajectory of the motion. Deictic paths, in a way, are a kind of reference point. The hither path *lái* denotes that the direction of the movement is toward a point near the speaker, whereas the thither path *qù* indicates that the end point of the movement is away from the speaker. In terms of processing load, when one aspect of the information regarding reference point on the trajectory of a motion event has been selected for explicit mention, the other relevant details are likely to be omitted and left inferred. The possibility of a trade-off relation between the encoding of ground elements and the use of deictic paths will be further examined in this dissertation.

Additionally, although not addressed in Chen’s study, the encoding of ground elements in fact reflects the influence of the syntactic properties of motion constructions on discourse patterns. Among the plus-ground clauses, there was only one data point in Chen (2007) in which a Chinese speaker referred to two ground elements (i.e., the source and goal) in a clause, coming closer to Spanish, in which only two such incidences were observed. The fact that Chinese narrators tended to limit the description of ground to one piece of information can be attributed to their inclination to use only one Verb-DC structure in a

clause, such that there is only one DC (simple) or two DCs (complex) allowed, and each verb-DC structure carries either one ground element (DC with Place NP) or none (plain form). Hence, Chinese narrators tend to supply one ground element per clause or, sometimes, simply leave out the ground descriptions.

Another strategy regarding the encodings of ground elements in Chinese is the use of Chinese preposition *zài*. *Zài* as a locative preposition can denote the **location** *in, on, at* which an action takes place or the **goal** of a motion event (cf. Henne, Rongen & Hansen, 1977; Liu, Pan & Gu, 1983). In Chinese, no individual prepositions correspond one-to-one to English *in/on/at*. Instead, a single preposition *zài* can be used with different spatial nominals to describe the abstraction denoted by all three of the English prepositions *in/on/at*. Taking for example the English sentences, “*She works in the city,*” “*She works at the mall,*” and “*She dances on the stage,*” when the same expressions are conveyed in Chinese, the preposition *zài* could be used in each context to mark the location and appear before the verbs, as shown in examples (7a), (7b), and (7c).

- (7) a. 她 在 城裏 工作。
Tā zài chéng-lǐ gōngzuò.
she **in** city-inside work
‘She works in the city.’
- b. 她 在 購物中心 工作。
Tā zài gòuwùzhōngxīn gōngzuò.
she **at** shopping mall work
‘She works at the mall.’

- c. 她 在 台上 跳舞。
Tā zài tái-shàng tiàowǔ.
 she **on** stage-top dance
 ‘She dances on the stage.’

However, when *zài* is used to describe a motion event, differing from DCs which specify the direction or path of a motion event, it can denote only the final goal of the motion. Thus, it cannot mark the other ground elements such as source, medium, or milestone. The goal NP, meanwhile, cannot be omitted after *zài*. Also, the preposition *zài* appears at a post-verbal position when marking a goal. Compare the following examples:

- (8) a. 請 把 書 放 在 箱子裏。
Qǐng bǎ shū fang zài xiāngzi-lǐ.
 Please BA book put in box-inside
 ‘Please put the books in the box.’
- *b. 請 把 書 放 在。
Qǐng bǎ shū fang zài.
 Please BA book put in
 ‘lit. Please put the books in.’
- c. 請 把 書 放 在 桌子上。
Qǐng bǎ shū fang zài zhuōzi-shàng.
 Please BA book put on table-top
 ‘Please put the books on the table.’
- d. 請 把 書 放 進 去。
Qǐng bǎ shū fang jìn qù.
 Please BA book put into thither
 ‘lit. *Please put the books into [thither].’

As shown in examples (8a) and (8b), the goal NP *xiāngzi* ‘box’ is obligatory after preposition *zài*, omitting the goal NP will yield an ungrammatical sentence as in (8b). Also,

the spatial nominals attached to the location NPs, such as *lǐ* ‘inside’ in (8a) or *shàng* ‘top’ in (8b), are often required in order to specify the location. By contrast, after the complex DCs *jìn-qù* ‘into-hither,’ as in (8d), a ground NP is optional, as the main function of the DCs is to encode the direction of a motion, rather than marking the final location. Hence, the Chinese preposition *zài* in many ways functions differently from the DCs. However, both structures may be applied to describe the same motion event, as shown in (8a) and (8d). The choice between the two structures depends on what aspect of the motion event the speaker intends to highlight. If only the goal of the motion matters, the preposition *zài* is likely to be utilized. If it is the direction of the motion that needs to be specified, DCs would better serve the purpose. The Chinese preposition *zài* as a distinct syntactic category from DCs resembles, to a certain degree, the English spatial prepositions *in/on/at*, since the preposition *zài* can serve both as a locative marker to describe the location and a goal marker to describe the destination in a motion event, as do the English prepositions *in/on/at*. In Chinese lessons, the spatial preposition *zài* is usually taught before DC constructions. This study will examine whether the earlier acquired *zài* construction puts its imprint on the motion constructions acquired later in the learners’ developing grammar.

In sum, the extant findings, as a whole, point out that the structural and discourse characteristics of Chinese generally pattern with those of S-languages and sometimes show areas of intra-typological variation. More specifically, Chinese narrators differ from English

narrators in how they pack path components into a clause, how many ground elements they tend to encode per clause, and how much attention they allocate to deictic paths. In Slobin's TFS framework, these crosslinguistic differences reflect language-specific TFS patterns and preferences that narrators develop in the course of their L1 acquisition. With respect to L2 acquisition of motion language, these differences reveal areas of language-mediated concepts that would require L2 learners to fine-tune their L1 habitual ways in describing motions by restricting their use of path satellites and ground descriptions per clause and reallocating their attentional resources not only to the direction of the movement but also to the deictic path of the motion in relation to the speaker.

3.4 Previous Studies on L2 Acquisition of Chinese Motion Expressions

Chinese language teachers are fully aware of the challenges that motion constructions present to L2 learners, and studies analyzing L1 and L2 use of DCs have been conducted. Lu (1984) analyzed a corpus of written materials, containing 265,000 Chinese characters, to study the distribution of DCs in the writing of NSs. His corpus-based study also showed that the encoding of hither/thither path in describing a motion event is widely applied by Chinese NSs. He found that the Type (2) complex DCs often co-occur with the disposal BA-construction,⁷ and had the highest occurrence rate, 52.5%, among the different DC

⁷ When a BA-construction is used, certain word order restrictions will apply. For example, the object NP occurs in a preverbal position in the BA-construction, and the word order becomes SOV, differing from the regular SVO word order of Chinese (Li & Thompson, 1981; Liu et al., 1983). Thus, to express "he took out a book" in Chinese, a speaker can use either sentence (a) or (b).

E.g., (a) SVO → *Tā ná yì-běn-shū jìn lái le* 'lit. He-take-a-book-into-hither-Perf.'

patterns. The second most widely used DC form was the Type (1) simple DC construction, “Verb + *lái/qù* (hither/thither path)”, which occupied 23% of the DC incidence. On these grounds, he suggested the teaching of DCs should start from these two forms, and teachers can combine the DCs with the BA-construction to design different drill practices.

Additionally, Qian (1997) and Yang (2003) observed that the different types of DC patterns were not equally challenging for the learners they investigated. Qian (1997) analyzed the use of DCs by novice, intermediate, and advanced Japanese L1 learners of L2 Chinese. She designed and administered a questionnaire including multiple-choice questions and Japanese-to-Chinese translation questions. She found that the learners exhibited higher accuracy on Type (1) simple DCs than on Type (2) complex DCs. Also, the learners performed better on DCs without NPs (i.e., Types 1 & 2) than on the other four types of DCs that include an inserted NP. Yang (2003), on the other hand, investigated L1 English-speaking learners’ acquisition of DCs in a learner corpus. He found that the learners produced more non-target-like solutions in DCs with Place NPs (i.e., Types 4 & 6) than DCs with Object NPs (i.e., Types 3 & 5), as they often inserted the Place NPs in a position that was only acceptable for an Object NP. The more flexible word order accepted for an Object NP seemed to blur with the more restricted word order accepted for a Place NP in the learners’ developing

(b) BA-construction (SOV) → *Tā bǎ yì-běn-shū ná jìn lái le.* ‘lit. He-BA-a-book-take-into-hither-Perf.’ Sentence (a) shows a regular SVO word order using the Type (5) complex DC with Object NP construction. By contrast, sentence (b) contains a BA-construction, in which the Object NP appears in a preverbal position and thus does not intervene in the following DC pattern. As such, a plain DC form is used, in this case, Type (2) complex DC, *ná-jìn-lái* ‘take-into-hither.’

grammars. He interpreted this pattern of results as evidence of learners' overgeneralization of the variety of word orders that can be accepted for Object NPs versus Place NPs.

In my previous study (Wu, 2011), I used a controlled composition task and a picture-cued written task to explore learners' knowledge and degree of mastery of DCs. Analysis of 55 English-speaking learners' interlanguage data showed that the sources of difficulties in learning DCs came from the syntactic complexity of the target DC patterns and from the typological features of Chinese as a serial-verb language. The dual functions of DCs as both complements and full verbs seem to work to mask the syntactic regularity of DC patterns in a learner's developing grammar, inviting non-target-like patterns that resemble serial-verb constructions, such as **Mìfēng fēi chū shàng* 'lit. bee fly-out-up,' or **Xiǎo nánhái diào xià jìn lái* 'lit. little boy drop-down-into-hither.' Moreover, results of cross-sectional comparison showed that L2 learners' ability to grammatically operate the six types of DC constructions progresses along a hypothesized developmental order: (1) simple DCs, (2) complex DCs, (3) simple DCs with Object NPs, (4) simple DCs with Place NPs, (5) complex DCs with Object NPs, (6) complex DCs with Place NPs. This posited developmental sequence, based on the observed patterns of DC use from the English-speaking learners (speakers of an S-language), agrees with the findings that Qian (1997) reported for the Japanese-speaking participants (speakers of a V-language). It may be the case that speakers of S-languages and V-languages experience similar developmental pathways in learning to

describe motion events in L2 Chinese. The development of DCs, then, appears to be largely shaped by the internal syntactic complexity of the target forms and the cognitive load required in production.

3.4.1 L1-L2 Differences in the Conceptualization of Spatial Semantics

Learning to express motion events in a target-like manner also requires English-speaking learners to adjust to different L1-L2 modes of spatial categorization as well as L2-specific ways of path encodings. Such implicit processes of conceptual change that are associated with learning a new way of TFS in an L2 is called “rethinking-for-speaking” by Robison and Ellis (2008).

Because languages differ in how motion events are described and categorized (Bowerman, 1996; Choi & Bowerman, 1991; Pederson et al., 1998; Slobin, 2004; Talmy, 1985, 1991, 2000), the target L2 spatial morphemes often do not have one-to-one correspondent morphemes that carry exactly the same semantic content as in the L1. For instance, the spatial category that the English placement verb *put* can describe is subdivided into two placement verbs *legen* ‘lay’ and *stellen* ‘make stand’ in German (Slobin et al., 2010). The verb *legen* ‘lay’ is used when the object is placed horizontally, whereas *stellen* ‘make stand’ is used when the object is placed vertically. In addition to semantic variation in the category of placement verbs, crosslinguistic variation in VPs is also identified. Choi and Bowerman (1991) observed that English and Korean children used and understood spatial

words according to the categories of each language. Such language-specific differences in spatial categorization have been attested as early as 16-20 months. For example, the Korean-speaking children distinguished, like Korean adults, motion events between tight-fit (*kkita*, for “putting ring on finger” or “putting book in case”) and loose-fit events (*nehta*, for “putting apple in bowl” or “putting book in bag”). By contrast, English children distinguished the spatial distinctions between *in* (putting objects into a container) and *on* (putting objects into contact with flat surface), regardless of the differences between tight-fit and loose-fit.

Similar crosslinguistic divergences in spatial categorization exist between English and Chinese. The semantic classification represented by the English path satellite *up* is subdivided into two categories in Chinese: 上 *shàng* and 起 *qǐ*. The Chinese morpheme *shàng* conceptually highlights the region where the moving figure will be located after moving, while *qǐ* highlights the original region where the moving figure came from (Chu, 2004; Liu, Pan, & Gu, 1983; Liu, 1988; Yao & Liu, 1997; see also Dai, 2005). Consider the following examples:

- (9) a. 請 站 上 來。
Qǐng zhàn shàng lái.
 please stand **up** hither
 ‘lit.*Please stand up to here. / Please stand over here.’
- b. 他 站 起 來 了。
Tā zhàn qǐ lái le.
 he stand **up** hither Perf.
 ‘He stood up.’

In example (9a), using *shàng* to encode the path will suggest the agent moves upward to a profiled goal. The goal implied in this sentence could be a stage or any place in a higher position. By contrast, using *qǐ* to encode the path will profile only the source region of the movement. As in example (9b), the motion of standing up highlights the vertical lift from a seat, and there is no implied goal for the agent to move to. L1 Chinese speakers are sensitive to the distinction between *shàng* and *qǐ*, because learning the language as an L1 has trained them to be so. An English learner of L2 Chinese, by contrast, will need to reallocate attentional resources and reclassify the related spatial concepts in their L2 TFS in order to promptly describe motion events like those in examples (9a) and (9b). Wu (2011) has observed that learners often overlooked such distinctions between the two DCs *shàng* and *qǐ*. Learners' misuse of *shàng* and *qǐ* was especially pronounced at the intermediate level of proficiency. The process of restructuring involved in learning the specifications between *shàng* and *qǐ* seems to require a prolonged period of time.

Another path satellite showing different spatial categorization between English and Chinese is the DC 過 *guò*. The spatial notions defined in the Chinese DC *guò* can correspond to three English satellites, including *across*, *past*, and *over*. Consider the following examples:

- (10) a. 他 走 過 馬路。
Tā zǒu guò mǎlù.
 she walk **across** road
 'She walked across the road.'

b. 他 走 過 我 身 邊。
Tā zǒu **guò** wǒ shēn-biān.
she walk **past** my body-side
'She walked past me.'

c. 請 把 椅 子 搬 過 來。
Qǐng bǎ yǐzi bān **guò** lái.
please BA chair move **over** **hither**
'Please move the chair over here.'

The original basic spatial schema denoted by *guò* is illustrated in (10a). 過 *guò* describing the direction of moving from one side of the road to another is equivalent to the English satellite *across* in this sentence. In (10b), the spatial notion defined by 過 *guò* has transformed and extended to include the direction of moving “past” a point *me* on the trajectory. Additionally, the DC *guò* can also serve as a semantically general expression which can be used to describe a figure’s movement from one point to another. In sentence (10c), the speaker made the request to someone to move the chair over. *Guò* in this sense is roughly equal to *over*. The different spatial senses of *guò*, structured by interrelated schemas, represent a complex abstraction, which Chinese NSs learn how to command through experiencing occurrences of the different semantic elements in a variety of communicative contexts in the course of their L1 acquisition. Wu (2011) has shown that when one spatial category in learners’ L1 is subdivided into two in the L2, as seen in the case of *shàng* and *qǐ*, learners are likely to be less sensitive to the distinctions of the new sub-categories. *Guò*, on the other hand, represents another case, in which several spatial categories in the L1 are

collapsed into one in the L2. It would be interesting to explore whether L2 learners will be more apprehensive or at ease when using the broader path category *guò* in their L2.

Likewise, the encoding of hither and thither information (i.e., *lái* and *qù*) that appears as the DC2 in all complex DCs would require English-speaking learners to adjust themselves to an unfamiliar TFS pattern, in which the deictic path needs to be frequently attended to (Wu, 2011). Hanks (1996, 2009) points out that properly uttering deictic expressions involves several simultaneous dimensions of processing. Interlocutors need to resort to perception, proximity, and ongoing interaction itself in the context of utterance. For two interlocutors to effectively communicate, it is necessary that they share not only the same grammar, but also share the same pragmatically appropriate ways to orient themselves verbally and perceptually in the social context.

Furthermore, Liu (1980) observes that a Chinese speaker, depending on the perspective one adopts, has three different ways to use the deictic paths *lái/qù*. When the first-person viewpoint is used, the place where the speaker stands would be the deictic center⁸ in relation to which a deictic expression is anchored. As shown in the following examples, the hither path *lái* in (11a) denotes that the animate agent Little Wang is walking toward the speaker, and the thither path *qù* in (11b) refers to the movement of the inanimate patient *shū* ‘book’ away from the speaker. Such deictic expressions are egocentric.

⁸ A deictic center, sometimes referred to as an *origo*, is a reference point in relation to which a deictic expression is to be interpreted (cf. Markman, 1999).

(11) a. 小 王 走 進 來 了。
Xiǎo Wáng zǒu jìn lái le
Little Wang walk into **hither** Perf.
'Little Wang walked in [hither].'

b. 書 被 拿 去 辦 公 室 了。
Shū bèi ná qù bàn gōng shì le.
book Bei take thither office Perf.
'The book was taken [thither] to the office.'

However, when the third-person viewpoint is adopted, the speaker as a narrator could place the deictic center at the location of a character, as illustrated in (12a) and (12b). In (12a), the narrator places the deictic center at the location where Little Wang is, and the hither path *lai* denotes Little White's movement toward Little Wang. Likewise, in (12b), the deictic center is also placed at Little Wang, and the thither path *qu* describes the book's displacement is away from Little Wang.

(12) a. 小 王 看 見 小 白 走 進 來 了。
Xiǎo Wáng kànjian Xiǎo Bái zǒu jìn lái le
Little Wang see Little White walk into **hither** Perf.
'Little Wang saw Little White walked in [hither].'

b. 小 王 給 小 白 寄 去 了 兩 本 書。
Xiǎo Wáng gěi Xiǎo Bái jì qù le liǎng-běn-shū.
Little Wang for Little White send **thither** Perf. two-CL.-book
'Little Wang sent [thither] two books to Little White.'

In third-person narration, a narrator can also place the deictic center at a place that is of focus or at a location where an event is about to take place. As illustrated in (13), the

narrator directs the focus on the apartment and uses the hither path to describe the new tenants' moving in toward the apartment.

- (13) 那棟公寓 搬 來 了 兩個新房客。
Nà-dòng-gōngyù bān lái le liǎng-ge-xīn-fángkè.
that-CL.-apartment move **hither** Perf. two-CL.-new-tenant
'Two new tenants moved into [hither] that apartment.'

In this regard, Wu (2011) designed a picture-cued written task to elicit use of deictic paths in different contexts. In this task, the deictic center was pre-assigned to a designed character "A," and the participant was asked to assume they were "A" in these situations. The results showed that the complex DCs, which encode two dimensions of a single motion event (e.g., *chū-lái* 出-來 'out-hither,' *shàng-qù* 上-去 'up-thither') in separate lexical items, were found to be more challenging for L2 learners than were simple DCs. Moreover, English-speaking foreign language learners had more difficulty in incorporating the hither/thither perspective when describing motion events than heritage language learners. The deictic paths were often inappropriately, or sometimes ungrammatically, omitted in foreign language learners' production.

In short, the recategorization and reallocation of attentional resources needed for acquiring Chinese DCs, such as *shàng*, *qǐ*, *guò*, *lái*, and *qù*, could be additional sources of challenge in developing L2 ways of rethinking-for-speaking. As suggested by Slobin (1996), L2 learners may require a relatively long period of time to restructure their L1 manners of

TFS in order to be able to express motion events fluently in the L2, and exactly how long such transformation could take may vary considerably depending on the length and amount of L2 exposure. It would be desirable to incorporate a new task which requires shifts of deictic center in narrating different motion events. Such a task would provide evidence for how adept L2 learners, especially advanced heritage learners, adopt different perspectives for encoding deictic paths. Additionally, to explore the underlying cognitive processes that may not be obvious from speech alone, it would be of interest to apply methods developed in simulation semantics research to explore the online processing of deictic paths during L2 TFS. If L2 learners can process Chinese deictic paths in a way similar to the NSs, and thus show similar simulation patterns as the NSs, this would suggest that L2 speakers could have successful acquisition of L2 TFS patterns.

3.4.2 Differences between Heritage and Foreign Language Learning

L2 learners' interlanguage development in using motion event expressions may differ according to their degree of L2 exposure and frequency of L2 use inside and outside the classroom (Wu, 2011). Studies have shown that heritage language learners⁹ (HLLs), as a result of their prior and prolonged exposure to the language and culture, exhibit different learning profiles from foreign language learners (FLLs) (see Au & Romo, 1997; E. J. Kim, 2003; H.-S. Kim, 2001; Kondo-Brown, 2005; Lee et al., 2005; McGinnis, 1996; Wu, 2011).

⁹ HLLs can be defined as learners who have acquired their cultural and linguistic competence in a nondominant language through contact at home with foreign-born parents and/or other family members (Kondo-Brown & Brown, 2008; Valdés, 1995).

For instance, HLLs were found to be more confident in their listening ability, and to have more heterogeneous competencies in speaking, reading, and writing skills than their FLL counterparts (e.g., H.-S. Kim, 2001; McGinnis, 1996). In terms of L2 morphology and syntax, differences between HLLs and FLLs have also been identified. For example, Au and Romo (1997) observed that first-year university Korean HLLs outperformed FLLs on grammaticality judgments involving the use of subject and object case markers.

Furthermore, in terms of L2 acquisition of motion expressions, it has been observed that HLLs and FLLs of the same proficiency level differ in their use of DCs (Wu, 2011). HLLs are more competent in incorporating the hither/thither perspectives and more at ease with the dual functions of DCs than are FLLs. In accordance with cognitive linguistic and usage-based accounts of L2 acquisition (Robinson & Ellis, 2008), for my study, I considered it important to inspect performances separately by HL or FL learning background. In the next chapter, I will discuss the criteria for classification of HLLs and describe the data collection and methodological procedures.

CHAPTER 4 METHODOLOGY

4.1 General Research Questions

The literature review in the preceding chapters has revealed that learning to express motion events in an L2 is likely to involve a complex process of learning L1-L2 differences in lexicalization patterns, preferred discourse styles, and habitual TFS patterns associated with language processing. These combined factors had not been examined comprehensively in any prior study from a cognitive linguistic, empirical perspective. Therefore, this study employs an approach involving three different experimental methods to provide a thorough analysis of learners' interlanguage development for describing motions, so as to better understand the rethinking-for-speaking difficulties that L2 learners typically encounter. The three methods adopted for this study were an online judgment task, an oral narrative task, and a picture-cued written task. The following general research questions will be addressed:

Based on subjects' performance on the three tasks, how do L2 Chinese learners use motion language? Specifically, (a) how does the learners' ability to use motion event expressions relate to their overall L2 Chinese proficiency? (b) what differences are there between L2 learners' and NSs' use of motion event expressions? (c) do HLLs and FLLs exhibit different learning profiles?

4.2 Specific Research Focus and Methods of Data Collection

Five instruments were developed and administered for this study (see Table 5 below). The learner participants took part in the three main tasks in a fixed order, starting with the online judgment task, followed by the oral narrative task, and finishing with the picture-cued written task. This sequence was devised to minimize the possibility that they would become aware of the target structures intended for elicitation, since the picture-cued written task was the most explicitly designed to elicit the target motion constructions, while the online judgment task was least explicit in this regard. After completing the three tasks, the learner participants filled out a background information questionnaire, designed to measure their prior contact with Chinese. Finally, they completed an elicited imitation task as a general proficiency measure for Chinese. On average, the learner participants spent about 35 to 50 minutes to complete the procedure.

Table 5 Tasks and Procedure

Step	Instrument	Time for completion
1.	Task 1: Online judgment task	8 to 10 min.
2.	Task 2: Oral narrative task (see Appendix D)	5 to 8 min.
3.	Task 3: Picture-cued written task (see Appendix C, Parts I & II)	12 to 20 min.
4.	Background information questionnaire (see Appendix B)	1 to 2 min.
5.	Elicited imitation test (see Appendix A)	9 to 10 min.

Note. Total time required: 35-50 minutes

In addition to answering the general research questions, each task was designed to explore different aspects of L2 TFS performance across different modalities. In the following sections, I will briefly introduce each main task and describe its specific research focus.

Detailed descriptions for each instrument and data coding procedure will be presented in Chapters 5 to 8. Presentation of the three tasks will start from the picture-cued written task, which explored learners' ability to describe motion events at the sentence level. I will then turn to the oral narrative task, which captured learners' discourse-level production of motion event descriptions. Last, I will present the online judgment task, which explored learners' online processing of Chinese deictic paths.

4.2.1 Picture-cued Written Task

The picture-cued written task (see Appendix C) was developed to tap into learners' L2 competence in "thinking for writing." Compared with their speaking skills, L2 learners have more time and opportunities to monitor their own production in writing. Nonetheless, since they are also faced with L1-L2 differences and similarities in type and feature of the motion constructions, the process of developing "thinking for writing" in L2 Chinese could be a considerable challenge for English-speaking learners of Chinese, as shown in my previous study (Wu, 2011). Given that the picture-cued written task has been previously adopted (Wu, 2011), the results of this current application will be compared with the data obtained from my prior study. Moreover, my analysis focuses on the use and acquisition of DCs that encode

upward movements (i.e., 上 *shàng* and 起 *qǐ*) and deictic paths (i.e., 來 *lái* and 去 *qù*), which were areas that required further exploration.

For the picture-cued written task, there were 16 critical items that required participants to use the designated verb when writing down 16 motion sentences, with 8 items for Part I, and 8 for Part II. In Part I, each item was composed of two consecutive pictures depicting different spatial movements in different scenarios. The learners were asked to imagine what, if they were involved in the scenario, they would say to describe the other character's spatial movement. For Part II, the design was similar to that of Part I, the difference being that each item in Part II concerned making different requests. Different request scenarios were chosen to elicit natural use of deictic paths, which are frequently encoded when an interlocutor makes a request involving spatial movements. The learners spent about 12 to 20 minutes completing this task.

4.2.2 Oral Narrative Task

The oral narrative task was designed to explore learners' competence of TFS. This task focused on comparison of different groups' narrative production in terms of: (a) the use of motion verbs: a type/token analysis; (b) the use of motion constructions; (c) the use of path and ground encodings; and (d) the descriptions of consecutive motions. A wordless picture story, comprised of 12 sequential pictures, was developed. The picture strips depicted a story about a boy looking for his missing dog. While searching for his dog, he went to different

places and became involved in a variety of self-initiated and caused motion events.

Participants were given 2-3 minutes to read the 12 picture strips (see Appendix D). They were told to prepare to tell a story in Chinese describing what they saw, providing as much detail as they could. Participants were allowed to look at the pictures while telling the story. Each story was audio recorded and transcribed for follow-up analyses. The learner participants spent about 5 to 8 minutes completing this task.

4.2.3 Online Judgment Task

The online judgment task, targeting “listening for imaging,” was designed to investigate learners’ performance in online processing for L2-specific encoding of the hither/thither paths. Specifically, this task was developed to explore: (a) the extent to which L2 learners ran mental simulations when comprehending motion sentences that contained the Chinese deictic DCs *lái* ‘moving toward the speaker’ or *qù* ‘moving away from the speaker’ and (b) how such simulation phenomena might relate to participants’ Chinese proficiency levels or language backgrounds. Marinis (2003) indicates that very little is known about how L2 learners process an L2 in real time and, thus, underscores the benefits of using online measurements for SLA. Slobin’s TFS hypothesis has highlighted crosslinguistic differences in online processes for language production and comprehension. Hence, it is crucial to adopt an online task in order to better capture learner’s ability to process motion language.

The experiment was run on a PC laptop computer using SuperLab 4.5 Stimulus Presentation Software (Cedrus, 1997). The experiment was a partial replication of Kaschak et al. (2005). Participants listened to sentences describing events that involved movement in a direction that could easily be interpreted as either toward or away from themselves (e.g., Toward: 車子開過來了。 *Chēzi kāi guò lái le*. ‘The car is approaching.’ Away: 車子開過去了。 *Chēzi kāi guò qù le*. ‘The car is moving away.’) while simultaneously watching a black-and-white motion percept. The motion percept was intended to convey a sense of objects moving either toward or away from the participants. A match condition was produced when the sentence described motion in the same direction as the motion depicted in the percept. In contrast, a mismatch condition was generated when the sentence described motion that was opposite to the motion depicted in the percept. Participants then pressed a key labeled “Y” if the sentence made sense, or pressed a key labeled “N” if the sentence did not make sense. They were told that their responses would be timed and they should respond as quickly as possible while still maintaining accuracy. A total of 16 critical sentences and 24 filler sentences were included in this experiment. A practice trial containing 5 sentences was given prior to the experimental trials. Reaction times were measured and compared between the matching and non-matching conditions and among different groups. The learner participants spent about 8 to 10 minutes completing this experiment.

4.3 Participants

A total of 160 speakers participated in this cross-sectional study. Eighty were L2 Chinese learners, 40 were NSs of Chinese, and 40 were NSs of English participated. All participants were recruited at a large public university in the United States. All the learner participants identified English as their current strongest language. At the university where they were currently studying, learners who have a heritage language background are typically instructed in the same mixed classes as those who have no such background. Because one focus of this study was to investigate whether HLLs and FLLs differ in terms of their use and acquisition of Chinese motion expressions, the learner participants were subdivided into two groups, namely, HLLs ($n = 40$) and FLLs ($n = 40$). The criteria for classification as an HLL were: (1) that the learner identified his or her strongest language before the age of five as Mandarin Chinese or another Chinese dialect, or (2) that he or she had one or both parents with Mandarin Chinese or another Chinese dialect as their native or dominant language, and that he or she also reported exposure to the language at home. Based on information gathered from the background information questionnaires collected from the 40 HLLs, 75% ($n = 30$) of them met the first criterion, and 100% of them ($n = 40$) met the second. Out of the 30 HLLs who identified their strongest language before five as Mandarin Chinese or another Chinese dialect, 22 spoke Cantonese, 5 spoke Mandarin, 1 spoke Min, and 1 spoke Amoy. All of the HLLs reported contact with Mandarin Chinese or another Chinese dialect via parents

or relatives outside the classroom.

Another focus of this study was to explore the relationship between learners' ability to use motion event expressions and their L2 Chinese proficiency level. Hence, the 80 learners were drawn from different proficiency groups. Forty of the learners were sampled from lower division courses in the Chinese program, which included different sections of the 200-level Chinese language courses. The other 40 were from upper division courses, comprised of mostly the 300- and 400-level Chinese language courses and some graduate courses related to Chinese studies. Moreover, to ensure that all learners participating in this study had learned the target motion expressions, only learners who had studied Chinese at college for at least three semesters prior to their involvement in this study were recruited.

Proficiency was then further determined by an elicited imitation task (cf. Erlam, 2006; Ortega, Iwashita, Norris, & Rabie, 2002). The Mandarin elicited imitation (EI) task utilized in this study was a Mandarin version of the EI task designed by Ortega et al. (2002), which tested parallel EI tasks across four languages, including English, German, Spanish, and Japanese, and found that the EI tasks successfully offered a good indication of learners' global L2 proficiency levels. The Mandarin version of the EI task (see Appendix A) was a translation of an English EI task (Zhou & Wu, 2009) with minimal revisions for each item, when necessary to adjust the length of syllables or to more naturally reflect features of the Mandarin language in translation. The Mandarin EI task comprised 30 Mandarin sentences,

ranging from 7 to 19 syllables. The 30 items together contained a wide range of vocabulary and grammatical structures, and thus presented varying degrees of challenge. During the task, participants were instructed to repeat each sentence they heard as well as possible. To avoid rote repetition, there was an interval of 2.5 seconds between the end of each sentence and the start of each repetition. The entire repetition task was about 10 minutes long. A 5-point scoring rubric (extracted from Ortega et al., 2002) was used to evaluate learners' performance on each repetition. The highest possible individual score was 120, based on 30 items polytomously scored from 0 to 4.

- 4 = Perfect repetition
- 3 = Accurate content repetition with some (un-)grammatical changes
- 2 = Changes in content or in form that affect content
- 1 = Repetition of half of the stimulus or less
- 0 = Silence, only one word repeated, or unintelligible repetition

The Mandarin EI task was piloted with 23 L2 Chinese learners in low ($n = 11$) and high ($n = 12$) proficiency groups. Participants in the pilot study were recruited from intuitions other than that where the dissertation study was conducted. Participants in the low proficiency group were students enrolling in a first-year Chinese class, and those in the high proficiency group were from an advanced class. A reliability test¹⁰ showed that the Cronbach's alpha value was .97, suggesting very good internal consistency for the EI scores.

¹⁰ The reliability test using Cronbach's Alpha coefficient was utilized to measure the consistency of the results delivered in the EI test. A Cronbach's Alpha above .7 is generally accepted as a sign of acceptable reliability (for more details, see Allen & Yen, 2002).

Moreover, an independent-sample t-test¹¹ showed that there was a significant difference in scores for high ($M = 71.33$, $SD = 16.7$) and low ($M = 27.36$, $SD = 14.17$) proficiency groups; $t(21) = 6.78$, $p = .00$, $Cohen'd = 2.84$. These results indicate that the EI task successfully discriminated among high and low proficiency groups.

In this EI task, it was observed that learners in the high proficiency group were more capable of repeating longer sentences than those in the low proficiency group. As Ellis and Barkhuizen (2005) suggested, “when the sentence is long enough..., the learners will not be able to memorize the exact words and will have to process it for meaning” (p. 38). An exact repetition, especially when the length of the sentence is beyond the capacity of short-term memory, requires learners to be able to promptly comprehend the sentence after listening to it. Furthermore, in addition to semantic processing, it also requires learners to attend to linguistic forms and grammatical structures that sometimes are not seen as carrying substantial meanings. It was found that words having little lexical meaning or ambiguous meaning, such as the Chinese sentence-final particle 了 *le* (denoting change of status) or adverb 才 *cái* (denoting lateness of an event/action), were often omitted from low proficiency learners’ repetitions, although such omission would not cause much change in meaning for the sentence overall. By contrast, the high proficiency learners demonstrated more advanced skill at retaining original linguistic forms than did the low proficiency

¹¹ The independent-sample t-test was used to determine whether the mean scores of the two proficiency groups differed from each other (for more details, see Coladarcì, Cobb, Minimum, & Clarke, 2008). The p-value was .00, lower than the α -level at .05, suggesting that there was a statistically significant difference between the mean scores of the two groups.

learners. This phenomenon is in agreement with the findings of Sachs (1967) that, after a sentence is heard, the linguistic form and specific wording of the utterance is easily lost and forgotten, but its meaning can be stored for a significantly longer time. As Van Patten (1996, 2002, 2004) has suggested that learners process input for meaning before they process for form. Only when learners are familiar with the majority of the lexical items in the input can they allocate attentional resources to process the form. The processing demands for retaining the form of an utterance thus require high L2 proficiency, such that learners can engage in semantic processing without undue constraint and remain capable of devoting resources to process the form as well.

The validity of the Mandarin EI task was further tested using the data set collected in this study. The EI scores collected from the 40 learners in higher division courses were compared with those from the 40 learners in lower division courses, and the results again demonstrated that learners in higher division courses had significantly higher EI scores ($M = 66.5$, $SD = 23.17$) than did learners in lower division courses ($M = 45.55$, $SD = 20.52$), $t(78) = 6.78$, $p = .00$, $Cohen'd = 0.96$. This newly developed Mandarin EI task has therefore proved to be an effective tool for measurement of L2 learners' global L2 Chinese proficiency levels.

The Mandarin EI task was, then, utilized as a proficiency measure in this study. The median score of the 80 L2 learners' EI task scores, namely, the score of 50, which separated

the higher half of the sample from the lower half, was used as the cutoff point for discrimination of the high and low proficiency groups in both HLLs and FLLs. To explore the use and acquisition of motion expressions by groups of HLLs and FLLs at different proficiency levels, learner participants who scored below 50 on the Mandarin EI task were classified as having low proficiency, and those who scored above 50 were considered as having high proficiency.

As shown in Table 6, four groups were generated, using background and proficiency as grouping variables. Results of an independent-sample t-test showed that low-proficiency HLLs ($M = 36.21, SD = 7.04$) and FLLs ($M = 35.04, SD = 11.46$) did not differ from each other in terms of their EI scores, $t(35.845) = .391, p = .698, Cohen'd = 0.12$. There was also no significant difference in scores for high-proficiency HLLs ($M = 76.23, SD = 16.27$) versus FLLs ($M = 72.00, SD = 18.40$), $t(40) = .779, p = .441, Cohen'd = 0.24$. Hence, low-proficiency HLLs and FLLs were treated as groups of the same low-proficiency level, and so were high-proficiency HLLs. Differences drawn from comparisons between HLLs and FLLs at the same proficiency level will then be attributed to the factor of learners' language background.

Table 6 Learner Participants by Background and by EI Task Score

Groups	N	Minimum	Maximum	Mean	SD
Low					
HLLs	14	22	47	36.21	7.04
FLLs	24	15	49	35.04	11.46
High					
HLLs	26	51	112	76.23	16.27
FLLs	16	52	115	72.00	18.40

Note. The EI score of 50 was the cut point for the low and high groups.

Based on the results of the background information questionnaire (see Appendix B), Table 7 summarizes the main elements of the learners' language backgrounds for each group. College denotes their program level, with 200-level courses coded as 2, 300-level courses as 3, 400-level courses as 4, and graduate-level courses as 5. As shown in Table 7, FLLs generally scored higher than did HLLs. This indicates that, although some of the FLLs were placed at a higher program level, their overall Chinese proficiency was probably similar to at least some of the HLLs at a lower level. That is, it is likely that some of the HLLs in the same mixed class with FLLs were more proficient than their FLL classmates.

Table 7 Summary of Biographical Information

Groups	N	EI score	College	Travel	Exposure	Self-study
Low						
HLLs	14	36.21	2.21	1.03	2.54	1.57
FLLs	24	35.04	2.52	0.53	0.38	1.92
High						
HLLs	26	76.23	2.83	2.43	2.23	1.54
FLLs	16	72.00	3.38	3.96	0.94	1.88

Note. The figures in this table are mean values from each of the measurements. College and travel are expressed in years. Exposure and self-study are expressed in frequency based on a Likert scale from 0-4.

In this Table, travel, measured in years, is based on learners' report of their prior experience of travelling or living in a Chinese-speaking country. In this connection, low-proficiency HLLs had more experience staying in a Chinese-speaking environment than did their FLL counterparts. However, the opposite was true for the high proficiency groups, where FLLs had an average of 3.96 years of time spent in a Chinese-speaking country, which was the longest among all groups. A further distinction can be made regarding the travel experience between the HLLs and FLLs. HLLs' travel experiences took place mostly at a young age, before puberty, and some of them even periodically traveled with their parents to visit their relatives. In contrast, most of the FLLs' periods of travel to Chinese-speaking countries took place during or after their college years.

The final two elements, exposure and self-study, are based on learners' self-ratings on their use of Mandarin Chinese and/or another Chinese dialect outside the classroom, where "not applicable" and "never" are coded as 0, "occasionally" as 1, "sometimes" as 2, "frequently" as 3, and "almost always" as 4. Exposure includes learners' self-ratings on two variables: frequency with which (a) parents/grandparents spoke Chinese to the learner and (b) relatives/friends spoke Chinese to the learner. HLLs at both levels reported that they frequently heard Chinese or used the language with their family, relatives, or friends; by contrast, FLLs at both levels indicated that less than "occasionally" they had such L2 exposure. Self-study was a self-reported rating on how much the learners had actually spent

time studying Chinese. The figures of 1.92 (Low FLLs) and 1.88 (High FLLs) indicate that FLLs at both levels more frequently engaged in self-study Chinese outside the classroom, with a score slightly higher than that reported by HLLs at each respective level (Low HLLs = 1.57; High FLLs = 1.54).

Among these four elements, the indices of travel and exposure give a direct indication of the extent to which the learners were able to participate in communicative practices, where the production and reception of the motion language are closely tied to concrete actions or movements in real-life situations. These two indices together suggested that the high-proficiency HLLs had more opportunities than the other learner groups to use motion language to interact and communicate with members of the L2 community. They reported frequently hearing and using Mandarin Chinese and/or another Chinese dialect with their family, relatives, or friends outside the classroom, and they also had an average of 2.43 years of time staying in a Chinese-speaking country.

Turning to the NS groups, 40 Chinese NSs and 40 English NSs recruited from the same university participated in this study. NS baseline data were collected to serve as a basis for comparison with the data produced by L2 learners and to test the effectiveness of the research design for eliciting the target structures. The Chinese NSs were international students or their spouses, who had lived in English-speaking countries for less than three years, and thus were considered L1-dominant, with L2-to-L1 influence expected to be minimal (Cook, 2003).

Likewise, the English NSs were monolingual English speakers or L1 English-dominant speakers, who had studied a foreign language for less than three years. The 40 Chinese NSs completed all of the three main tasks using the same instruments as those given to the learner participants. They spent about 20 to 30 minutes to finish all of the tasks. The 40 English NSs participated in only the picture-cued writing task and the oral narrative task, for which they spent about 13 to 20 minutes total.

This chapter has described the research focus and the methods for experimental tasks involving different modalities that were utilized in this study. In the following three chapters, I will present the results and analysis for each respective task.

CHAPTER 5 THINKING FOR WRITING

5.1 Background

This chapter presents an analysis of the data elicited from the picture-cued written task and discusses the learners' L2 thinking-for-writing ability when describing motions. The purpose of the picture-cued written task was to explore the impact of L1-L2 differences and similarities in lexicalization patterns on learners' L2 written production. Chinese uses post-verbal DCs to encode paths. Although this strategy is superficially similar to the use of English VPs (e.g., *up*, *down*, *out*), Chinese DCs differ from English VPs in terms of both the variety of DC types that exist in Chinese, and the variation in word order patterns associated with their use. Moreover, the frequent encodings of deictic paths (i.e., by use of *lái* 'hither' and *qù* 'thither'), which represent an L2-unique way of TFS, are challenging for English learners of Chinese. In this regard, HLLs are more competent in encoding deictic paths than are FLLs (Wu, 2011), potentially because HLLs have had more opportunities to hear and use deictic paths in natural and meaningful contexts, facilitating the development of L2 TFS during the course of habitual incorporation of deictic perspectives. Moreover, the L2-specific spatial specifications between the two DCs for upward motions, *shàng* and *qǐ*, are easily overlooked by learners. This dissertation utilizes the picture-cued written task that was adopted in Wu (2011) to further explore learners' L2 thinking-for-writing development. In particular, I have explored the relationship between learners' ability to use DCs and their

overall L2 Chinese proficiency, while comparing their use of DCs to that of NSs to see whether there are any differences in the use and acquisition of DCs between HLLs and FLLs.

5.2 Method

The picture-cued written task (see Appendix C) comprised 16 motion event scenarios, each of which required participants to use one Chinese sentence to describe the movement shown in consecutive pictures. Each scenario featured two characters, “person A” and “person B,” who were the same for all scenarios. Participants were instructed to describe B’s movements or to make a request to B from the perspective of A. This design was meant to clearly present the deictic viewpoint for each context. Additionally, in order to elicit different types of DC constructions, four items gave only designated verbs as cues, five items gave both designated verbs and Place NPs, and seven items included both designated verbs and Object NPs. Four items from the previous picture-cued written task (Wu, 2011) were replaced with new ones, two of which were added for elicitation of the target upward DCs, and the other two of which were added to balance the number of Place/Object NP cues used in the new design. The revised task thus retained the same structure for NP cues as the original design.

A total of 160 subjects comprising eighty learner participants, 40 Chinese NSs, and 40 English NSs completed this task. For the instrument given to Chinese NSs, all of the English instructions were translated into Chinese. For the instrument given to the English NSs, the

Chinese Place/Object prompts were removed from the pictures, and only their English translations were presented. Also, the designated Chinese verb for each sentence was removed. This was because the English direct translation for these Chinese verbs might not fit the motion scenarios as well as the original Chinese verbs did. Moreover, removal of the designated verbs allowed English NSs to have the freedom to use different motion verbs to describe the motion events. The motion verbs elicited could thus provide information about English NSs' preferences concerning the natural use of motion verbs.

For each of the motion events, participants can exert their linguistic strategies to use different types of DCs that would be considered grammatically acceptable and contextually appropriate. For instance, for the situation of “please bring up the pizza” (see Item 4 of Part II in Appendix C), the responses collected from the Chinese NSs included: (a) Type 2 complex DCs: *Qǐng bǎ pīzà sòng shàng-lái* ‘lit. please BA pizza **send up-hither**’ (b) Type 5 complex DCs with Object NPs: *Qǐng sòng pīzà shàng-lái* ‘lit. please-**send-pizza-up-hither**’ (c) Type 6 complex DCs with Place NPs: *Qǐng bǎ pīzà sòng-shàng-wǔlóu-lái* ‘lit. please-BA-pizza-**send-up-the-5th-floor-hither**.’ When a Chinese NS uses the BA-construction to make the request, the Object NP will occur in a preverbal position and generate a sentence like (a). If the BA-construction is not used, sentence (b) is likely to be the alternative. In some cases, an NS can add a goal Place NP on their own as in (c), because the picture prompt shows the pizza should be delivered to the fifth floor. The responses produced by the 40 Chinese NSs,

therefore, provided important baseline data which were used to compare the distribution of each type of DC patterns produced by the learners.

Two coders worked independently to code and score all responses. The coding results were compared, and any disagreements were resolved by discussion. The data produced by English NSs and Chinese NSs were tallied, and they are summarized in Tables 7 and 8. Data from Chinese NSs were further coded and categorized according to the six types of DCs.

Each of the 16 items produced by the L2 learners were polytomously scored on a scale of zero to three. A score of three was assigned to responses that included the appropriate DCs and correct word order. A score of two was assigned to responses that only included appropriate choice of DCs, but that had a non-target-like word order. A score of one was given when the DCs supplied were: (a) contextually inappropriate (e.g., the DCs supplied did not match the movement delineated in the picture, or they incorrectly encoded the deictic paths), or (b) grammatically incorrect (e.g., supplying a second DC other than 來 *lái* or 去 *qù* in a complex DC construction, such as *跑去回 *pǎo qù-huí* 'lit. run thither-back' or having inappropriate omission of deictic paths in a DC construction without an accompanying NP, such as *跑回了 *pǎo huí le* 'lit. run back-Perf.'). Zero was given when no DC was supplied. Responses scored as two or three were further coded and categorized into the six types of DCs.

5.3 Results

I first present results of the analyses of the data produced by English and Chinese NSs. Encodings of path between the two NS baseline groups are compared. After L1 data is presented, I present the results of L2 production and describe the differences in performance among the different learner groups.

5.3.1 Encoding of Path in L1 Production

Responses for the 16 items by 40 English NSs are summarized in Table 8. The columns for motion sentence and path present the complete motion sentence(s) and the path(s) encoded for each item that were produced by the majority of the participants. When the responses diverged, and there was no obvious unanimous description, sentences having more than 10 incidences are listed. Since no designated verbs were given in this task, a relatively wider variety of motion verbs was utilized by the English NSs to describe the motion events. The final column, motion verb, summarizes all the motion verbs that appeared in the NSs results.

Table 8 Summary of Motion Event Descriptions Produced by English NSs

Part I. Motion Sentence	Path	Place/Object Cue	Motion Verb
1. B walked down the stairs.	down	stairs	walk, go, proceed, descend, strike, trot
2. B left the classroom. B walked out of the classroom.	out of	classroom	leave, walk, exit, storm
3. B jumped up.	up	none	jump, lunge, leap
4. B moved out of the dormitory. B left the dormitory.	out of	dormitory	move, leave, escape, roll
5. B stood up.	up	none	stand
6. B ran into the library.	into	library	run, rush, come, hurry, stumble, barge, arrive, bring
7. B jogged toward his house. B ran to his house. B jogged home.	toward/to	none	jog, run, go, return, pass, backpedal
8. B brought the letter.		letter	bring, run, give, arrive, hurry, rush, deliver
Part II. Motion Sentence	Path	Place/Object Cue	Motion Verb
1. Please put the books in the box.	in	book	put, pack, place, load, drop, stack
2. Please take out your homework.	out	homework	take, bring, pull
3. Please put a chair on the stage. Please bring a chair.	on	chair	put, bring, get, find, grad, place
4. Please bring the pizza upstairs. Please bring the pizza up to me.	up	pizza	bring, deliver
5. Please put the chair back to the original place. Please return the chair.	back to	chair	return, put, take, move
6. Please park your car in the garage. Please move to the left.	in/to	none	park, move
7. Please bring another chair.		chair	bring, get, find, grab, borrow
8. Please deliver the books to the classroom.	to	classroom	deliver, bring, take, carry, cart

As shown in Table 8, the motion verbs used by English NSs were mostly manner verbs and paths were expressed via path satellites. The use of different manner verbs, such as

jump, lunge, and leap elicited for Item 8 of Part I, reveal that English has a rich and fine-grained manner verb lexicon. However, since the instrument given to the Chinese NSs listed a designated verb for each item, there were no comparable data from Chinese NSs completing this task to study whether English NSs could in fact be generally expected to use more diverse manner verbs than Chinese NSs when describing the same motion scene. This question will be addressed in the next chapter, when I examine the comparable data on use of motion verbs in narratives produced by the English and Chinese NSs.

The Chinese NSs' responses are summarized in Table 9 following the same data coding procedure. The type of DC construction used in each motion sentences was also coded.

Table 9 Summary of Motion Event Descriptions Produced by Chinese NSs

Part I. Motion Sentence	Path	Place/Object Cue	Motion Verb
1. Type (4) <i>B zǒu xià lóutī le.</i> B walk down stair Perf. 'B walked down the stairs.'	<i>xià</i> 'down'	<i>lóutī</i> 'stairs'	<i>zǒu</i> 'walk'
2. Type (4) <i>B zǒu chū jiàoshì le.</i> B walk out classroom Perf. 'B walked out of the classroom.'	<i>chū</i> 'out'	<i>jiàoshì</i> 'classroom'	<i>zǒu</i> 'walk'
3. Type (2) <i>B tiào qǐ lái le.</i> B jump up hither Perf. 'B jumped up.'	<i>qǐ-lái</i> 'up-hither'	none	<i>tiào</i> 'jump'
4. Type (4) <i>B bān chū sùshè le.</i> B move out dormitory Perf. 'B moved out of the dormitory.'	<i>chū</i> 'out'	<i>sùshè</i> 'dormitory'	<i>bān</i> 'move'
5. Type (2) <i>B zhàn qǐ lái le.</i> B stand up hither Perf. 'B stood up.'	<i>qǐ-lái</i> 'up-hither'	none	<i>zhàn</i> 'stand'

6. Type (4) B pǎo jìn túshūguǎn le. B run into library Perf. 'B ran into the library.'	jìn 'into'	túshūguǎn 'library'	pǎo 'run'
7. Type (4) B pǎo huí jiā le. B run back home Perf. 'B ran back home.'	huí 'back'	none	pǎo 'run'
Type (2) B pǎo huí qù le. B run back thither Perf. 'B ran back.'	huí-qù 'back-thither'		
8. Type (3) B sòng xìn lái le. B deliver letter hither Perf. 'B delivered the letter.'	lái 'hither'	xìn 'letter'	sòng 'deliver'
Type (1) B bǎ xìn sòng lái le. B BA letter deliver hither Perf. 'B delivered the letter.'			
Part II. Motion Sentence	Path	Place/Object Cue	Motion Verb
1. Type (3) Qǐng bǎ shū fang jìn xiāngzi-lǐ. Please BA book put into box-inside 'Please put the books into the box.'	jìn 'into'	shū 'book'	fàng 'put'
Locative preposition zài Qǐng bǎ shū fang zài xiāngzi-lǐ. Please BA book put in box-inside 'Please put the books into the box.'	zài 'Prep. in'		
2. Type (2) Qǐng bǎ gōngkè ná chū lái . Please BA homework take out hither 'Please take out your homework.'	chū-lái 'out-hither'	gōngkè 'homework'	ná 'take'
3. Type (5) Qǐng bǎ yǐzi guò lái . Please move chair past hither 'Please move the chair over.'	guò-lái 'over-hither'	yǐzi 'chair'	bān 'move'
Type (2) Qǐng bǎ yǐzi bān shàng lái . Please BA chair move up hither 'Please move the chair up.'	shàng-lái 'up-hither'		
4. Type (2) Qǐng bǎ pīzǎ sòng shàng lái . Please BA pizza deliver up hither 'Please bring the pizza up.'	shàng-lái 'up-hither'	pīzǎ 'pizza'	sòng 'deliver'

<p>5. Type (2) <i>Qǐng bǎ yǐzi bān huí qù.</i> Please BA chair move back thither ‘Please move the chair back.’</p>	<p><i>huí-qù</i> ‘back-thither’</p>	<p><i>yǐzi</i> ‘chair’</p>	<p><i>bān</i> ‘move’</p>
<p>6. Type (4) <i>Qǐng bǎ chē kāi jìn chēkù.</i> Please BA car drive into garage ‘Please drive your car into the garage.’</p> <p>Type (2) <i>Qǐng bǎ chē kāi jìn qù.</i> Please BA car drive into thither ‘*lit. Please drive your car into.’</p> <p>Type (4) <i>Qǐng bǎ chē kāi dào chēkù.</i> Please BA car drive to garage ‘lit. Please drive your car to the garage.’</p>	<p><i>jìn</i> ‘into’</p> <p><i>jìn-qù</i> ‘into-thither’</p> <p><i>dào</i> ‘to’</p>	<p>none</p>	<p><i>kāi</i> ‘drive’</p>
<p>7. Type (2) <i>Qǐng bān yǐzi guò lái.</i> Please move chair over hither ‘Please move the chair over.’</p> <p>Type (2) <i>Qǐng bǎ yǐzi bān guò lái.</i> Please BA chair move over hither ‘Please move the chair over.’</p>	<p><i>guò-lái</i> ‘over-hither’</p>	<p><i>yǐzi</i> ‘chair’</p>	<p><i>bān</i> ‘move’</p>
<p>8. Type (4) <i>Qǐng bǎ shū sòng dào jiàoshì.</i> Please BA book deliver to classroom ‘Please deliver the books to the classroom.’</p> <p>Type (6) <i>Qǐng bǎ shū sòng dào jiàoshì qù.</i> Please BA book deliver to classroom thither ‘Please deliver the books to the classroom.’</p>	<p><i>dào</i> ‘to’</p> <p><i>dào-qù</i> ‘to-thither’</p>	<p><i>jiàoshì</i> ‘classroom’</p>	<p><i>sòng</i> ‘deliver’</p>

As shown in Table 9, Chinese NSs used different motion constructions to describe motion events, combining the designated verb and different DCs to encode the path of movement. The only item in which path was not exclusively described by means of a DC was Item 1 of Part II. Thirty percent of the responses (12 out of 40) used the preposition *zài* to express this motion request, in which the path of the movement was overlooked, and only the goal NP of the movement, *xiāngzi-lǐ* ‘box-inside,’ was underscored and marked by *zài*. Given that the preposition verb *zài* represents another syntactic category distinct from DCs, this item

was therefore excluded from the analyses. Out of the remaining 600 responses ($k = 15$) produced by the 40 Chinese NSs, 95% contained the target DC constructions, suggesting the task design successfully elicited the target structures.

Comparing the encoding of the path component between English and Chinese, one can find that the Chinese NSs often took a deictic viewpoint perspective when describing motion events, especially when there was a change of location for an object NP. For the six items that included an Object NP cue (viz. Item 8 in Part I and Items 2, 3, 4, 5, and 7 in Part II), 93% of the Chinese NSs' responses encoded a deictic path via *lái* 'hither' or *qù* 'thither.' English NSs' responses to these six items, by contrast, did not show such a habitual TFS pattern of expressing deictic orientation relations. The hither/thither perspective, however, was sometimes implied in English verb roots such as *bring* and *return* (e.g., Item 8 of Part I and Item 5 of Part II). It appears that the two languages have their own linguistic strategies to express deictic orientation, but Chinese speakers more frequently do so by means of supplying the DCs *lái* 'hither' and *qù* 'thither' in a complex DC pattern. The question that is of interest is, then, when the deictic spatial relation needs to be frequently attended to and mapped onto another syntactic category in the target L2, would development of such L2 TFS pose a challenge for L2 learners?

Another interesting phenomenon pertaining to the use of deictic path is the relation between the encoding of ground elements and the use of deictic paths in motion event

descriptions that are observed in the results of Chinese NSs. For the five items that gave a Place NP cue (viz. Items 1, 2, 4, and 6 in Part I and Item 8 in Part II), out of the 200 responses that involved a Place NP, only 13.5% (n = 27) encoded the deictic path, suggesting that when a ground element is encoded, there is a higher chance that the hither/thither encoding will be overlooked. This is likely due to the fact that ground elements and deictic paths carry similar functions, namely, providing information about the reference points for the trajectory of the motion. Deictic paths, in a way, are themselves a kind of reference point. The hither path *lái* denotes that the end point of the movement is the speaker, whereas the thither path *qù* indicates that the end point of the movement is away from the speaker. When one reference point regarding the trajectory has been selected for explicit mention, information concerning the other reference points is likely to be omitted, and left to be inferred, due to limited processing capacity. For instance, in Item 2 of Part I, participants described a scenario in which A and B were originally together in a classroom, and then B walked out of the classroom. When the Place NP cue “*classroom*” was required in the sentence, encoding the ground element of the classroom, this NP already denoted the source point of the movement. Adding a hither path *qù* to further specify that the movement was directly toward a reference point away from person A could perhaps be seen as redundant information. Compared with the frequent encodings of the deictic paths by Chinese NSs in the items with a designated Object NP cue, the scarce encodings of the deictic paths in the

items with a designated Place NP reveal that there is a tendency for Chinese NSs to make a trade-off between drawing attention toward ground elements or toward deictic paths when constructing motion expressions.

The distinction of upward direction by *shàng* and *qǐ* was another pronounced difference between English and Chinese NSs' path descriptions. Chinese NSs used *shàng* to describe upward movement with a goal, as for Item 4 of Part II, for which participants requested person B to deliver a pizza to a residence on the fifth floor. Because this upward movement has a profiled goal, Chinese NSs chose *shàng* to describe this event. On the other hand, for Item 3 of Part I, participants described person B's movement of jumping up in the air in a basketball game, and in Item 5 of Part I, participants described person B's movement of standing up to answer a question. These two events of upward motion do not have a profiled goal, and all Chinese NSs used *qǐ* to encode the paths, profiling the source of the movement. English NSs' responses to these three items, by contrast, did not involve such distinctions. The particle *up* was used in all of these the three motion scenarios.

Moreover, a comparison of the path satellites used in the two languages also shows how path can be conceptualized in language-specific ways. Note that the direction of "returning to the original place" can be expressed via the verb "return" or the satellite "back" in English, and be expressed via the DC 回 *huí* 'back' in Chinese. For Item 5 of Part II, participants were asked to make a request to person B to return a borrowed chair to its

original place. English NSs responded with “*Please put the chair **back to** its original place,*” or “*Please **return** the chair.*” Chinese NSs also used *huí* to make the request, “*Qǐng bǎ yǐzi bān huí qù.* ‘lit. please-BA-chair-move-back-thither.’ For Item 7 of Part I, learners were asked to describe a motion event in which the person B finished jogging and ran back to his house. While English NSs described the scenario as: “*B jogged **toward** his house,*” “*B ran **to** his house,*” or “*B jogged **home,***” the majority of the Chinese NSs used the DC 回 *huí* ‘back’ to describe the scene. In Chinese speakers’ minds, home represents a prototypical case of “one’s original place,” where the DC *huí* is characteristically used to describe the path of returning to one’s residence. Comparison of the NSs’ responses for these two items showed that English and Chinese speakers may conceptualize the same motion event differently, even when similar path encoding devices are available in both languages.

Another example showing differences in path conceptualization between English and Chinese is the use of 過 *guò* ‘over.’ For Item 7 of Part II, the majority of the English NSs made the request “*Please **bring** another chair*” in response to the scenario, and Chinese NSs used *guò-lái* to describe the path, “*請把椅子搬過來。* *Qǐng bǎ yǐzi bān guò lái.* ‘lit. Please-move-chair-over-hither. Please move the chair over here.’ When perceiving the same motion scenario, English NSs only encoded the sense of moving toward in the verb *bring*, whereas most Chinese NSs had explicitly denoted the deictic path and used the DC *guò* to describe the path. By contrast, only one English NS used *over* to describe the path in this item.

This again shows that speakers of different languages may conceptualize path information in different manners, regardless of the availability of similar path encoding devices.

5.3.2 Encoding of Path in L2 Production

5.3.2.1 Use of DCs and Global Proficiency

The results for the second picture-cued written task are given in Table 10 and Figure 1.

A two-way ANOVA procedure¹² was adopted to analyze the trustworthiness of the overall effects of proficiency level (low vs. high) and participant background (HLL vs. FLL). The data yielded a significant main effect for proficiency level, $F(1, 76) = 33.717, p < .05$, partial $\eta^2 = .307$. That is, the L2 Chinese learner's ability to use DCs on this task was positively correlated with their global Chinese proficiency, as learners in the high proficiency group performed significantly better than learners in the low proficiency group for both HLLs and FLLs.

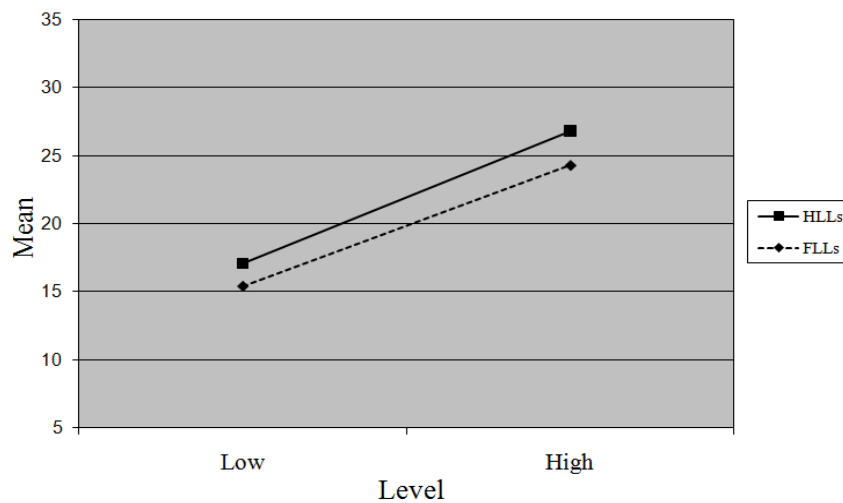
Table 10 Scores of DC Constructions in Picture-cued written Task

Groups	N	Minimum	Maximum	Mean	SD
Low					
HLLs	14	4	30	17.07	6.98
FLLs	24	2	25	15.37	7.18
High					
HLLs	26	4	41	26.81	7.14
FLLs	16	15	36	24.31	6.20

Note. Total possible individual score was 41, based on 15 items scored polytomously as 3, 2, 1, or 0.

¹² The two-way ANOVA procedure was used to determine whether three or more mean scores on two factors differed from one another (for more details, see Coladarci, Cobb, Minimum, & Clarke, 2008). A p-value smaller than the α -level at .05 suggested that there was a statistically significant main effect for proficiency level.

Figure 1 Effect of background by level



Different from the findings in Wu (2011), the effect for participant background was not significant, $F(1, 76) = 1.699, p > .05$, partial $\eta^2 = .022$. That is, there was no significant difference between HLLs and FLLs in terms of their overall DC scores that measured learners' awareness of DCs' grammatical functions and their knowledge of choosing appropriate DCs and producing DC constructions with correct word orders. The interaction between proficiency levels and participants' background was also not significant, $F(1, 76) = 0.06, p > .05$, partial $\eta^2 = .001$.

The relationship between learner's ability to use DCs and their L2 Chinese proficiency (measured by EI scores) was further investigated using the Pearson correlation coefficient¹³. This measure suggested a significant positive correlation between these two variables, $r = .657, n = 80, R^2 = 0.432, p < .001$, showing that more proficient L2 Chinese learners generally demonstrate better command in their use of DCs.

¹³ The Pearson correlation coefficient describes the linear association between two variables. The correlation coefficient ranges from -1 to 1. A value above .5 is generally accepted as a sign of a large correlation (for more details, see Allen & Yen, 2002).

5.3.2.2 Performance on Six Types of DC constructions

Producing a grammatically correct DC construction involves appropriate choice of DCs that accurately describe the directionality specifications for a motion event. Table 11 presents the distribution of appropriate DCs produced by the L2 learners and the Chinese NSs. As can be seen by Table 11, the 80 L2 learners generally patterned with the Chinese NSs in that they produced Type 2 complex DCs (all learners: 15%; Chinese NSs: 37%) and Type 4 simple DCs with Place NPs (all learners: 16%; Chinese NSs: 39%) more frequently than the other types of DCs. By contrast, their use of Types 3 and 5 (i.e. DCs with Object NPs) were at lower rates. Inspection of the data showed that this was because the learners and the Chinese NSs alike tended to use the disposal BA-construction to describe motion event scenarios that involved a change of location for an Object NP and sometimes even added a goal NP on their own to specify where the Object NP was moved to. Such linguistic strategies consequently resulted in the lower percentage use of the DCs Types 3 and 5 and led to higher rates for DCs Types 2 and 4.

In terms of the total number of appropriate choice of DCs, the high-proficiency HLLs and FLLs outperformed their respective low-proficiency counterparts by producing much more appropriate DCs. Also, the high-proficiency HLLs (61%) produced more appropriate DCs than did the high-proficiency FLLs (54%).

Table 11 Distribution of Appropriate Choice of DCs in Picture-Cued Written Task

Group	N	total <i>k</i> ^a per group	(1)		(2)		(3)		(4)		(5)		(6)		Total	
			Simple DCs		Complex DCs		Simple DCs +Object NPs		Simple DCs +Place NPs		Complex DCs +Object NPs		Complex DCs +Place NPs		<i>raw</i>	%
			<i>raw</i> ^b	% ^c	<i>raw</i>	%	<i>raw</i>	%	<i>raw</i>	%	<i>raw</i>	%	<i>raw</i>	%		
NSs	40	600	15	3	220	37	20	3	233	39	49	8	34	6	570	95
Low																
HLLs	14	210	5	2	8	4	5	2	33	16	8	4	8	4	67	32
FLLs	24	360	13	4	31	9	5	1	43	12	3	1	21	6	116	33
High																
HLLs	26	390	5	1	79	20	14	4	83	21	18	5	39	10	238	61
FLLs	16	240	3	1	57	24	6	3	37	15	5	2	22	9	130	54
All																
Learners	80	1200	26	2	175	15	30	3	196	16	34	3	90	8	542	47

^a *k* = 15 per participant.

^b The column marked *raw* denotes raw frequency counts per type of DC.

^c Percentages indicate relative frequency for appropriate choice of DCs for each type.

When there was a designated Place or Object NP given, as for the DC Types 3-5, the task required an additional aspect of grammatical performance, namely, to accurately arrange the word order according to the type of DC and the type of NP. Table 12 presents the learners' performance on word order for Types 3-5. The average accuracy rate across all learner groups for the complex DCs, Types 5 and 6, were 82% and 54%, respectively, lower than the two simple Types 3 and 4 at 92% and 84%, showing that word orders associated with complex DC constructions were more challenging than those associated with simple DCs.

Table 12 Mean Percentages of Correct Word Order in Picture-Cued Written Task

Group	(3)		(4)		(5)		(6)	
	Simple DCs		Simple DCs		Complex DCs		Complex DCs	
	+Object NPs		+Place NPs		+Object NPs		+Place NPs	
	n ^a	% ^b	n	%	n	%	n	%
NSs	14	100	39	100	30	100	21	100
Low								
HLLs	4	100	12	97	5	100	6	25
FLLs	4	75	17	55	2	75	12	33
High								
HLLs	12	92	23	98	10	80	20	69
FLLs	4	100	13	85	2	50	12	63
All learners	24	92	65	84	19	82	40	54

^a The column marked *n* denotes the number of participants examined per type of DC.

^b Percentages represent average accuracy for choice of word order for each type.

Learners performed more poorly for constructions involving Place NPs than for those involving Object NPs, for both simple and complex DCs. The word orders for DCs with Place NPs are syntactically more restricted than is the case for Object NPs, which

consequently gave rise to more non-target-like solutions, with insertion of Place NPs in an ungrammatical position. These findings are in agreement with Wu (2011).

5.3.2.3 Adjustment to L2-Specific Ways of Path Conceptualization

Comparison of the path encodings used by the 40 English NSs and 40 Chinese NSs has shown that the two languages present variation in the ways that speakers of the two languages conceptualize directionality for movement. Specially, the L2 path encoding devices that differ from learners' L1 TFS include the use of deictic paths 來 *lái* and 去 *qù* in complex DC patterns, the spatial distinctions between the two DCs for upward motions, 上 *shàng* and 起 *qǐ*, and the use of the DCs 回 *huí* and 過 *guò*. This section will focus on learners' competence in adjusting to these L2-specific ways of path conceptualization.

With respect to use of deictic paths, learners' responses to the six object-moving motion events are summarized in Table 13. Out of the 240 responses produced by the 40 Chinese NSs, 93% encoded deictic paths, suggesting that attention to deixis is closely tied to Chinese NSs' TFS when describing directionality for displacement of an object. In other words, the L1 they speak has the linguistic function of supplying a deictic path in the complex DC patterns. The frequent encoding of the hither/thither paths predisposes the speakers to habitually attend to perception, proximity, and ongoing interaction in the context of utterance, whereby they can quickly construct the deictic expressions. In comparison, the low proficiency L2 learners did so only 24% of the time for HLLs and 19% for FLLs. This

Table 13 Appropriate use of the deictic paths in object-moving motion events

Group	N	Part I		Part II		Part II		Part II		Part II		Part II		Mean %
		Item (8)		Item (2)		Item (3)		Item (4)		Item (5)		Item (7)		
		<i>lái</i>		<i>lái</i>		<i>lái</i>		<i>lái</i>		<i>qù</i>		<i>lái</i>		
		<i>raw</i> ^a	% ^b	<i>raw</i>	%	<i>raw</i>	%	<i>raw</i>	%	<i>raw</i>	%	<i>raw</i>	%	
NSs	40	40	100	40	100	32	80	37	93	34	85	40	100	93
Low														
HLLs	14	3	21	5	36	2	14	5	36	3	21	2	14	24
FLLs	24	5	21	5	21	8	33	4	17	2	8	3	13	19
High														
HLLs	26	14	54	18	69	15	58	19	73	14	54	14	54	60
FLLs	16	8	50	8	50	8	50	7	44	7	44	6	38	46

^a The column marked *raw* denotes raw frequency counts of appropriate use of *lái* / *qù* for each item.

^b Percentage indicates the rate of appropriate use of *lái* / *qù*.

suggests that, while some learners began to be aware of the importance of specifying the deictic direction in these contexts, they had not cultivated the L2 habitual TFS pattern of directing their attention to deictic paths as did the Chinese NSs. Nevertheless, there was a pronounced positive difference between learners at the two proficiency levels. High proficiency HLLs encoded deictic paths 60% of the time, and FLLs did so 46% of the time. Echoing Wu (2011), the results show that HLLs had demonstrated a better command than FLLs at both levels in terms of their ability to incorporate the hither/thither perspective during L2 TFS. This difference between HLLs and FLLs will be further explored in the next chapter, when I examine results of the oral narrative task.

Table 14 Appropriate use of the DCs for upward directions (上 *shàng* and 起 *qǐ*)

Group	N	Part I		Part I		Part II		Mean %
		Item (3)		Item (5)		Item (4)		
		<i>qǐ</i>		<i>qǐ</i>		<i>shàng</i>		
		<i>raw</i> ^a	% ^b	<i>raw</i>	%	<i>raw</i>	%	
NSs	40	40	100	40	100	35	88	96
Low								
HLLs	14	0	0	4	29	5	36	21
FLLs	24	2	8	6	25	4	17	17
High								
HLLs	26	6	23	18	69	20	77	56
FLLs	16	7	44	10	63	8	50	52

^a The column marked *raw* denotes raw frequency counts of appropriate use of *shàng* / *qǐ*.

^b Percentage indicates the rate of appropriate use of *shàng* / *qǐ*.

Turning to the use of DCs for upward motions, as indicated in Table 14, Chinese NSs unanimously used 起 *qǐ* in Items 3 and 5 of Part I to describe upward movement profiling

the source, and predominantly used 上 *shàng* in Item 4 of Part II to describe movement profiling the goal at the rate of 88%. Low proficiency HLLs on average had 21% appropriate encoding of the upward DCs, and FLLs had 17%. Again, high proficiency learners' performance showed a positive difference for both HLLs (56%) and FLLs (52%). HLLs slightly outperformed FLLs across both levels. Further examination of the responses that scored 1 (cases where DCs were supplied but used inappropriately) indicated that misuse of 上 *shàng* for 起 *qǐ* accounted for the majority of the non-target-like production among all groups. Fifty percent of the non-target-like production produced by low proficiency HLLs was due to misuse of *shàng* for *qǐ*. In this regard, FLLs displayed 49%, and high proficiency HLLs and FLLs had 55% and 71% respectively. The findings are parallel with Wu (2011) in that learners tended to choose *shàng* to describe upward movements that should be specified by *qǐ*, potentially because *shàng* has a wider range of use in encoding upward motions than *qǐ* in the language. These results suggest that while advanced learners were more capable of supplying context-appropriate upward DCs, many of them were still perplexed by the subtle distinctions between *shàng* and *qǐ*. This holds true regardless of the learners' language background or level of L2 proficiency.

Table 15 Appropriate use of the DC 回 *huí*

Group	N	Part I Item (7) <i>huí</i>		Part I Item (5) <i>huí</i>		Mean %
		<i>raw</i> ^a	% ^b	<i>raw</i>	%	
		NSs	40	33	83	
Low						
HLLs	14	4	29	4	29	29
FLLs	24	8	33	6	25	29
High						
HLLs	26	15	58	18	69	63
FLLs	16	6	38	8	50	44

^a The column marked *raw* denotes raw frequency counts of appropriate use of *huí*.

^b Percentage indicates the rate of appropriate use of *huí*.

Learners' use of the DC 回 *huí* is summarized in Table 15. This DC denotes the direction of returning to an original place, which is similar to the English path satellite '*back*.' However, comparison of the English and Chinese NSs' use of *back* and *huí* showed that, even though similar path satellites are available in the respective languages, speakers of the two languages did not always choose the equivalent satellites *back* or *huí* to encode the path when describing the same motion event. For Item 5 of Part II, the majority of the English NSs chose *back* to express the direction of returning a borrowed chair to its original place, and 100% of the Chinese NSs' responses used *huí*. For the low proficiency learners, HLLs displayed 29% appropriate use of *huí*, and FLLs at 25%. High proficiency HLLs (69%) showed a larger degree of positive difference than their low proficiency counterparts than did high proficiency FLLs (50%). As for Item 7 of Part I, the English NSs did not use *back* to describe the scenario in which the person B finished jogging and ran back to his house,

whereas the Chinese NSs used *huí* to encode the path 83% of the time. For this item, compared with their performance in Item 5 of Part II, high proficiency learners' appropriate use of *huí* decreased to 58% for HLLs and 38% for FLLs, but the low proficiency learners did not show such a trend. The HLLs's use of *huí* remained at 29%, and the FLLs had even more frequent use of *huí* at 33%. L2 learners' acceptance to use *huí* seems to suggest that they disregarded the preferred strategy in their L1 and shifted to the L2-specific way of path conceptualization. However, we need to be cautious about this observation, as a closer examination of learners' use of *huí* showed that, out of the 30 incidences that had appropriate use of *huí*, all 30 of them encoded the ground 家 *jiā* 'home, house' together with *huí* in their responses. The phrasal verb 回家 *huí-jiā* 'lit. return home' is a vocabulary item that is introduced to L2 Chinese learners in the beginning lessons of most Chinese textbooks. Some textbooks even use the English translation 'go home' on the vocabulary list to explain this word. As a result, learners were likely to make use of the learned phrasal verb to depict this motion scenario, even though they may not fully understand the semantic content defined in *huí*. Given that 家 *jiā* 'home, house' was not a designated place NP required for this item, and Chinese NSs also produced many utterances in which they did not encode the ground *jiā*, the question as to whether the L2 learners had adjusted to the L2-preferred way of path encoding while describing the directionality for moving toward one's residence awaits further exploration.

Table 16 Appropriate use of the DCs 過 *guò* and 下 *xià*

Group	N	Part II Item (7)		Part I Item (1)	
		<i>guò</i>		<i>xià</i>	
		<i>raw</i> ^a	% ^b	<i>raw</i>	%
NSs	40	33	83	37	93
Low					
HLLs	14	1	7	12	86
FLLs	24	0	0	17	71
High					
HLLs	26	9	25	24	92
FLLs	16	3	19	15	94

^a The column marked *raw* denotes raw frequency counts of appropriate use of *guò* & *xià*.

^b Percentage indicates the rate of appropriate use of *guò* & *xià*.

Finally, Table 16 presents the results for learners' use of the DCs 過 *guò* and 下 *xià*.

The path satellite 過 *guò* can denote the different spatial notions of “moving *past* a point,” “moving *across* from one side to the other,” and “moving *over* to a point.” While Chinese NSs used *guò* 83% of the time for Item 7 of Part I, the high proficiency HLLs resorted to it only 25%, which was the highest among all groups. Overall, L2 learners' use of *guò* was scarce. Instead, most learners used 搬來 *bān lái* ‘move-hither’ to encode the path in this item. The Chinese verb 搬 *bān* ‘move’ does not imply movement directed toward the speaker. By adding the deictic path *lái*, the L2 learners created semantic content that was very similar to the English verb *bring*, which was adopted by the majority of the English NSs in their responses to this item. In a way, we can say that the L2 learners were still resorting to their L1 TFS while describing this motion scene. On the other hand, the DC *guò* encompasses different spatial notions defined by three English satellites, *across*, *past*, and *over*. It is also

possible that the complex spatial abstraction defined by *guò* presents a case in which the form-meaning relationships are less transparent than is the case for the other DCs. Since many Chinese textbooks often give only the translation of “past; passing a point” to introduce *guò*, the complex abstraction denoted by *guò* is likely to be obscure for learners, especially for FLLs, who have had L2 exposure only in the classroom and thus had fewer chances to experience the use of *guò* in natural contexts accompanied with actual spatial movements. Consequently, the learners were less ready to use *guò* and therefore produced more non-target-like path encodings.

Compared to 過 *guò*, the DC 下 *xià* does not encompass complex relations that correspond to more than one English satellite. The DC 下 *xià* is equivalent to the English satellite *down*. For Item 1 of Part I, the majority of the English NSs described the scenario as “*B walked down the stairs*,” and 90% of the English NSs used the particle *down* in their responses. The Chinese NSs also used *xià* 93% of the time, and the majority responded with: *B zǒu xià lóutī le*. ‘B-walk-down-stair-Perf.’, a sentence that has one-to-one correspondence structure with that of the English NSs’ response. Comparing learners’ use of 過 *guò* with that for 下 *xià* in Item 1 of Part I, one can see that the percentages of appropriate use of 下 *xià* across all groups were much higher. The high proficiency learners’ use of *xià*, including both HLLs and FLLs, were very close to that of NSs (93%) at 92% and 94% respectively. This suggests that the minimal L1-L2 distance between the satellites *xià* and *down* does not

require learners to restructure their L1-based concepts in L2 learning. Learners are therefore more readily to use it at an early stage of L2 acquisition.

5.4 Discussion

The results of the picture-cued written task showed that L2 learners' thinking-for-writing development in their use of DCs was positively related to their global Chinese proficiency. HLLs and FLLs at the same proficiency level did not differ in terms of their overall DC scores, which measured their awareness of DCs' grammatical functions and their ability to choose appropriate DCs and produce DC constructions with correct word order. However, it was observed that HLLs were more competent than FLLs in their ability to adjust to L2-specific ways of path conceptualization with respect to the encoding of the deictic paths and target-like use of the DCs 回 *huí* and 過 *guò*. Overall, the results of this task show that English-speaking learners were comfortable with using DCs to encode the path information. Nevertheless, the challenges were observed in areas where intra-typological differences existed between the learners' L1 and L2, such as complex DC types, the various word orders associated the use of DCs, and the L2-specific satellites that organize spatial relations in a manner different from those in learners' L1.

The positive distinctions observed between learners' performance across the two levels suggests that Chinese learners' L2 thinking-for-writing in expressing Chinese motion expressions progresses along with L2 global proficiency. However, writing as a mode of

expression does not have the same time pressure as speaking. L2 users thus have more chances to monitor and reflect on their production while using available L2 linguistic devices to encode their conceptualization of motion events. In the next chapter, I will focus on the learners' performance in the oral narrative task to explore the development of L2 thinking-for-speaking.

CHAPTER 6 THINKING FOR SPEAKING

6.1 Background

Shifting from a focus on learners' ability to describe motion events at the sentence level to one on description at the discourse level, this chapter presents an analysis of the data elicited from the oral narrative task. The oral narrative task was designed to explore learners' TFS competence in L2 Chinese narratives. The literature reviews in the preceding chapters have revealed that the structural and discourse characteristics of Chinese do not completely pattern with those of English. Chinese narrators sometimes show S-language tendencies, in that they use more manner verbs than path verbs, and that they tend to break complex motions into several event segments. Nevertheless, Chinese narrators also differ from English narrators in how they compact path components in a clause, how much attention they allocate to deictic paths, and the number of ground elements they tend to encode per clause. The analysis of the oral narratives in this chapter, therefore, first focuses on comparison of English and Chinese NSs' narrative production in terms of: (a) the use of motion verbs: a type/token analysis, (b) the use of motion constructions, (c) the use of path and ground encodings, and (d) the descriptions of consecutive motion events. Based on the results drawn from comparisons between the two NS baseline groups, I will then examine the learners' narrative production to investigate the influences of L1-L2 differences and similarities in structural and discourse characteristics on the learners' development of L2 TFS.

6.2 Method

The instrument used for the oral narrative task (see Appendix D) was a wordless picture story comprised of 12 sequential pictures. The pictures depicted a story about a boy looking for his missing dog. A total of 12 motion event segments were included in this story.

Table 17 Motion event segments in oral narrative task

Motion event segment	Self-initiated vs. Caused motion
1. A boy is walking his dog.	Self-initiated
2. The dog follows another dog into a school.	Self-initiated
3. The two dogs wander into a classroom.	Self-initiated
4. The boy goes up the stairs.	Self-initiated
5. The boy jumps onto a table.	Self-initiated
6. The boy jumps off the table.	Self-initiated
7. The boy runs out of the classroom.	Self-initiated
8. The boy goes down the stairs.	Self-initiated
9. The boy kicks a ball.	Caused
10. The dog brings the ball back.	Caused
11. The boy picks up the dog.	Caused
12. The boy and the dog leave.	Self-initiated

As shown in Table 17, the picture story presented a variety of self-initiated and caused motion events. Note that event segments 6 to 8 were a complex series of motions that the main character in the story (i.e., the boy) performed consecutively. Examination of the narrators' descriptions for segments 6 to 8 can reveal how they describe consecutive motions and organize path components in a motion clause.

A total of 160 subjects comprising eighty learner participants, 40 Chinese NSs, and 40 English NSs completed this task. All of the participants were given the same picture story. The Chinese and English NSs were instructed to use their respective native language to tell the story, and the learner participants were instructed to tell the story in L2 Chinese. Each story was audio recorded.

The audio recordings of the 160 stories were transcribed, and the resulting texts were divided into clauses, following the coding procedures provided in Berman and Slobin (1994, pp. 657-664). Appendix E provides the conventions for the transcription and coding procedures that were adopted in this study. A clause was defined as a unit containing a unified predicate that expresses a single situation (Berman & Slobin, 1994, p. 657). Clauses that contained information about an entity changing location from one place to another were further identified as motion clauses. Additionally, according to Özçaliskan and Slobin (2003) and Chen and Guo (2009), the motion verbs used in the motion clauses were classified into three types of verbs, including manner verbs, path verbs, and neutral verbs. The number of ground elements that were encoded per motion clause was tallied. The path components and motion verbs used to describe the sequence of consecutive motions (i.e., segments 6 to 8) were also analyzed. For the data from the Chinese NSs and the L2 learners, the motion constructions that were produced in the narratives were further categorized into four types according to their syntactic structures.

To establish coding reliability, 15% of the data produced by the English NSs and 15% of the data produced by the Chinese NSs and the L2 learners were independently inspected by a second coder, who was a NS of the respective language. The coding results between the two coders were compared, and any disagreements were resolved by discussion.

6.3 Results

I first present the results of the analyses of the narratives produced by English and Chinese NSs. After comparing these two NS baseline groups, I then present the results of L2 narratives and describe the differences in performance among the different learner groups. Because the data were measured on categorical scales, all of the statistical analyses presented in this section used non-parametric tests¹⁴. A Mann-Whitney U test was used to test for differences between two groups, and a Kruskal-Wallis test was employed for those among three or more groups. Furthermore, when the result of a Kruskal Wallis test was significant¹⁵, post-hoc tests were conducted between the four pairs of groups. The first two pairs of tests (i.e., Low HLLs vs. High HLLs; Low FLLs vs. High FLLs) were conducted to investigate whether the learners of the same language background differed across the two proficiency levels. The other two pairs of tests (i.e., Low HLLs vs. Low FLLs; High HLLs vs. High

¹⁴ Non-parametric methods were used for data collected in the narrative task, because they do not rely on assumptions that there is a strong underlying continuity or a normal distribution in the data (for more details, see Higgins, 2004).

¹⁵ For Kruskal Wallis test, a p-value smaller than the α -level at .05 would suggest that there is a statistically significant difference across the groups. To determine which of the groups are statistically different from one another, one needs to conduct follow-up Mann-Whitney U tests between pairs of groups as post-hoc tests (for more details, see Higgins, 2004).

FLLs.), on the other hand, were to explore whether HLLs and FLLs at the same proficiency level differed from each other.

6.3.1 Motion Events in L1 Narratives

6.3.1.1 Total Clauses and Motion Clauses

The first analysis conducted on the NSs' data was to compare the total number of clauses produced by the English and Chinese NSs and the number of motion clauses included in their narrative production. The results showed that there was a significant difference between the total number of clauses produced by the two NS groups, $U = 509$, $z = -2.803$, $p < .05$, $r = .31$. The Chinese NSs used more clauses to tell the story ($M = 33$) than did the English NSs ($M = 26$). Comparison of the number of motion clauses between the two groups included also revealed a significant difference, $U = 558.5$, $z = -2.336$, $p < .05$, $r = .36$. The Chinese NSs used more motion clauses to describe the motion scenes ($M = 15$) than did the English NSs ($M = 13$). However, in terms of the proportion of motion clauses to total clauses, the Chinese NSs ($M = 0.478$) did not significantly differ from the English NSs ($M = 0.498$), $U = 685.5$, $z = -1.102$, $p = .27$, $r = .12$. That is, while the Chinese NSs generally tended to use more clauses to tell the story, and they supplied more motion clauses than did the English NSs, the proportions of motion clauses to total clauses revealed no significant difference between the two NS groups.

6.3.1.2 Type-Token Analysis of Motion Verbs

Analysis of use of the motion verb types (see Appendix F for the list of all motion verbs found in the data) suggested that the Chinese NSs generally patterned with the English NSs in that they both typically used manner verbs to describe motion events, as is typical of S-languages and in contrast to V-language speakers, who tend to use more path verbs.

Table 18 Use of motion verbs: Types

	Manner Verb	Path Verb	Neutral Verb	Total
English NSs	20	14	6	40
Chinese NSs	15	9	9	33

As summarized in Table 18, the motion verbs used in the English NSs' narratives included 40 types of motion verbs, which outnumbered the motion verb types used by the Chinese NSs at 33. Among all motion verbs employed, there were 20 types of manner verbs used by the English NSs and 15 types by the Chinese NSs. The manner verbs accounted for the largest portion among the all types of motion verbs used in their respective dataset. These results are parallel with the findings reported in Chen (2007), who used elicited narratives of the frog story in his study. A closer examination of a specific sort of manner verbs used in this narrative task, namely, manner verbs for descriptions of horizontal movements, can demonstrate this feature.

(14) a. English manner verbs for descriptions of horizontal movement (10 types)

chase, catch, follow, race, roam, run, rush, stroll, walk, wander

b. Chinese manner verbs for descriptions of horizontal movement (6 types)

追 *zhuī* ‘catch,’ 跟 *gēn* ‘follow,’ 跑 *pǎo* ‘run,’ 走 *zǒu* ‘walk,’ 衝 *chōng* ‘dash,’
闖 *chuǎng* ‘barge in’

As shown in (14), to describe the manner of horizontal movement performed by the boy and the dog, the 40 English NSs used 10 different types of manner verbs in total, and the 40 Chinese NSs supplied 6. In terms of lexical diversity, the higher number of manner verb types employed by the English NSs indicates that English has a richer lexicon of manner verbs than Chinese, which confirms the observations proposed by Chen and Guo (2009) (see also Chu, 2004; Chen, 2007).

Turning to the category of path verbs, although using manner verbs together with satellites to describe motion events is a preferred option in S-languages, V-framed encoding options are also available in both English and Chinese. As illustrated in (15), the English NSs produced 14 types of path verbs, and the Chinese NSs produced 9 types in their respective elicited narratives.

(15) a. English path verb (14 types)

approach, come, cross, enter, exit, fetch, go, head, land, leave, pass, reach, retrieve, return

b. Chinese path verb (9 types)

來 *lái* ‘come,’ 去 *qù* ‘go,’ 上 *shàng* ‘ascend,’ 下 *xià* ‘descend,’ 進 *jìn* ‘enter,’
出 *chū* ‘exit,’ 回 *huí* ‘return,’ 過 *guò* ‘pass/cross’ 到 *dào* ‘arrive’

Comparing the path verbs used by the English and Chinese NSs clearly shows that, while Chinese path verbs overlap with their path satellites (i.e., DCs), English path verbs do not. In this aspect, Chinese is very different from English in that its path satellites not only function as path indicators separate from the verb roots, but can also appear as independent path verbs. It is likely that the dual syntactic functions of DCs may increase their level of complexity, which consequently leads to a longer time of acquisition for the L2 interlanguage system (Wu, 2011).

Finally, both English and Chinese NSs used a few types of neutral verbs such as *stand* or *sit*, which by themselves do not imply displacement, but can be used to describe a motion event when they are combined with a path satellite, such as *stand up* or *sit down*.

Another measurement pertaining to use of motion verb types that can be used as baseline data for comparison with the learner groups is the mean number of motion verb types that each NS group used to describe the story. The English NSs on average used 8.6 types of motion verbs, and the Chinese NSs used 8.5. That is, both groups of NSs used about eight or nine different motion verbs to describe the various motion events depicted in the story. These numbers can serve as a good index for the learners’ use and acquisition of motion verbs.

In sum, these results concerning the total numbers of types of motion verbs have shown that both English and Chinese NSs prefer to use manner verbs to describe motions, and English is generally more versatile in its manner verb lexicon. Next, I will examine the motion verb tokens and present the mean percentage distribution for each category of motion verbs from the two NS groups, which will serve as a basis for comparison among the different learner groups.

Table 19 Use of motion verbs: Tokens

	Manner Verb	Path Verb	Neutral Verb
English	59%	31%	8%
Chinese	69%	19%	11%

Note. Percentages are mean values for each category.

Although the English NSs used more types of manner verbs in their entire dataset, with respect to the mean percentage use of the motion verb tokens for each category (see Table 19), the Chinese NSs actually more frequently used manner verbs to describe motion events than the English NSs did, demonstrating a strong S-framed tendency. On average, 69% of the motion verb tokens produced by the Chinese NSs were manner verbs and 19% were path verbs, compared with the English NSs at 59% for manner verbs and 31% for path verbs. This suggests that filling in the main verb slots with manner verbs was the preferred linguistic strategy for both the English and Chinese NSs, and the Chinese NSs actually did so more frequently in this task.

6.3.1.3 Chinese Motion Constructions

Given that Chinese motion constructions exhibit distinct syntactic features from those of English motion constructions, analysis presented in this section focuses on the Chinese NSs' use of motion constructions. Table 20 summarizes the motion constructions found in the Chinese NSs' narratives.

Table 20 Distribution of Chinese motion constructions: mean values

Categories of motion construction	Percentage
Manner/Neutral V + DC1 + (DC2 <i>lái/qù</i>)	63%
Manner V only	17%
Path V only	13%
Path V + DC <i>lái/qù</i>	7%

A clear S-framed encoding preference was identified. As shown in Table 20, out of the 547 motion constructions produced by the Chinese NSs, the “Manner/Neutral Verb + DC1 + (DC2 *lái/qù*)” constructions accounted for 63%, suggesting a clear S-framed tendency.

Neutral verbs do not indicate translational motion by themselves and, thus, typically co-occur with DCs in motion expressions. By contrast, conflating manner and motion together, manner verbs can appear alone as another category of motion construction, and 17% of the motion constructions included such an encoding option. The other two categories, “Path Verb Only” and “Path Verb + DC *lái/qù*,” are cases of V-framed encodings, in which the path morphemes appeared as the main verbs rather than DCs. Examples of these two types are shown in (16).

(16) a. Path verb only

小 男孩 出 了 教室， 下 了 樓梯。
Xiǎo nánhái chū le jiàoshì, xià le lóutī.
little boy **exit** Perf. classroom **descend** Perf. stairs
'The little boy exited the classroom and descended the stairs.'

b. Path verb + DC *lái/qù*

他 的 小 狗 回 來 了。
Tā de xiǎogǒu huí-lai le.
he Gen. puppy **return-hither** Perf.
'His dog came back.'

In (16a), the path verbs 出 *chū* 'exit' in the first clause and 下 *xià* 'descend' in the second clause were used alone in each clause as an independent verb. On average, the Chinese NSs encoded described motion events by means of path verb at only 13%. In (16b), the path verb 回 *huí* appears as the main verb in the clause with a deictic DC *lái* attached to it to further denote that the direction of the returning was toward the character (i.e., the boy). The Chinese NSs used path verbs plus another DC to express motion events 7% of the time. If one compares the percentage use of "Manner/Neutral Verb + DC1 + (DC2 *lái/qù*)" (63%) with that of "Path Verb Only" (13%) and "Path Verb + DC *lái/qù*" (7%), it is clear that the set of Chinese path morphemes are much more frequently used as path satellites than as path verbs in the language. In response to Talmy's (2000) claim that motion event typology should reflect the most characteristic way in which a language encodes path information, the results of this study confirm that Chinese should be classified as an S-language, in agreement with Talmy (1991, 2000), Shen (2003), and Peyraube (2004). Chinese and English both favor linguistic strategies that encode path information via satellites.

6.3.1.4 Path and Ground Encodings

Examination of the number of ground elements encoded per motion clause showed an interesting structural contrast between English and Chinese. Table 21 summarizes the mean percentage distribution of ground elements that were encoded among all motion clauses produced by the English and Chinese NSs.

Table 21 Mean percentage distribution for encodings of ground elements

	Number of ground elements			
	0	1	2	3
English	34%	57%	7%	2%
Chinese	32%	68%	0%	0%

34% of the motion clauses produced by the English NSs did not include specification of the ground element, which was very similar to the ration for Chinese NSs at 32%. That is, the ratio of minus-ground clauses to plus-ground clauses was 34% to 66% for English, versus 32% to 68% for Chinese. These results differ from Chen's (2007) findings using 59 Chinese frog stories, in which he found the Chinese NSs showed a V-framed pattern, tending to leave out ground information at a rate of 48%, higher than the English NSs at 37%.

Table 21 also shows that English NSs encoded one ground element 57% of the time, and Chinese NSs did so 68% of the time, suggesting that encoding one ground element per motion clause was a preferred strategy for speakers of both languages. However, comparison of the percentage use of two-ground and three-ground clauses between English and Chinese

NSs showed that English NSs were more likely to encode more than one ground, whereas Chinese NSs almost always supplied only one ground element.¹⁶

This contrast can be attributed to the structural restrictions of Chinese motion constructions. While the syntactic features of English VPs make it possible to stack several path satellites that link up multiple ground elements in one clause, Chinese DCs cannot. A Chinese “Manner/Neutral Verb + DC1 + (DC2 *lái/qù*)” construction can only contain one type of DC (i.e., either a simple or complex DC), which may appear alone either without a ground element or with only one. Examples (17a) and (17b) were extracted from the datasets:

(17) a. A three-ground clause in English

*He ran out of the **door** down the **stairs** into a **park**.*

b. Two one-ground clauses in Chinese

他 跑 出 教室， 走 下 樓梯。
Tā pǎo chū jiàoshì, zǒu xià lóutī.
He run out **classroom** walk down **stairs**
'He ran out of the classroom and walked down the stairs.'

As shown in (17a) and (17b), when describing the same motion scenario, the syntactic properties of English motion constructions allow the narrator to stack several VPs in a clause to link up the three ground elements. By contrast, Chinese narrators needed to break it into

¹⁶ Although the Chinese Verb + DC construction can carry only up to one ground element, adding a preposition, such as 從 *cóng* 'from', 朝 *cháo* 'toward,' together with a motion construction can increase the number of ground elements to more than one in one clause (see example 7 in section 3.3.2 for use of 從 *cóng* 'from' and example 19 in this section for use of 朝 *cháo* 'toward'). However, such examples were not found in the Chinese NSs' dataset.

two clauses, in which each clause allows only one ground element. As a result, Chinese motion clauses contain mostly none or only one ground element.

Turning to the Chinese NSs' linguistic means for path encodings, a feature that stood out was the frequent encoding of deictic paths. Among the motion clauses produced by the Chinese NSs, 26% involved deictic encoding. Moreover, 61% of such deictic encodings were realized by means of complex DC patterns, showing a language-specific way of path encoding, in which both the direction of the movement and the deictic relation were encoded. Deictic paths in the English NSs' narration, by contrast, were often left unspecified. Compare the English and Chinese NSs' descriptions for the following scenes:

(18) a. *The female dog ran into a nearby school.*

b. 小 花 朝 學 校 的 方 向 跑 過 去 了。
Xiǎo huā cháo xuéxiào de fāngxiàng pǎo guò qù le.
little flower toward school Gen. direction run over **thither** Perf.
'Little flower ran away toward the school.'

(19) a. *He kicked the ball.*

b. 他 用 力 地 把 球 踢 出 去。
Tā yònglì de bǎ qiú tī chū qù.
he fiercely BA ball kick out **thither**
'He fiercely kicked the ball away.'

When telling the stories, the English and Chinese narrators both preferred to take a bystander's view and to place the deictic center on the location where the focused character *the boy* stayed. In (18), to describe the scene in which the boy's dog ran away from him and

followed another dog into a school, the Chinese NSs were inclined to use the thither path *qù* to denote the dog's movement being directed away from the deictic center, whereas most of the English NSs did not specify such spatial relation. Likewise, the scene illustrated in (19) depicted a caused motion event in which the movement of the ball was away from the deictic center *the boy*. Again, the Chinese NSs tended to encode the thither path, but the English NSs did not. The frequent use of such deictic expressions showed that Chinese narrators are used to promptly anchoring their utterances to spatial contexts, even when they are taking a bystander's view. The deictic encodings, in a way, also provide other Chinese listeners with reference points that highlight which character or location is being focused on, anchoring the descriptions of other movements to such deictic center. These deictic encodings can therefore serve as cues to lead listeners to focus on certain characters or locations and to facilitate comprehension of the spatial relations in the narrative.

6.3.1.5 Descriptions of Consecutive Motions

The final analysis conducted on the NSs' data was concerned with the descriptions of the consecutive motions that were presented in event segments 6-8. These three segments successively depicted the boy's movements of jumping off or down from the table, and his running out of the classroom and going down the stairs. The core information of a motion event, as defined by Talmy (1985, 1991, 2000), is the path component. In these three consecutive motion segments, the target path components are *off/down*, *out*, and *down*.

Analyses conducted on these consecutive motion events first examined how many of the three core components were encoded and then inspected how many motion verbs were used to describe the three event segments. Table 22 summarizes the results.

Table 22 Descriptions of consecutive motions: mean values

	Number of path components	Number of motion verbs	Ratio
English	2.0	1.8	0.9
Chinese	2.1 ^a	2.1	1.0

^aTarget paths that appeared with a deictic path, such as *xià-qù* ‘down-thither,’ were treated as one path component.

As can be seen in Table 22, both English and Chinese NSs tended to selectively encode the segments. On average, only about two out of the three path components were described in the NSs’ narration. Among these three consecutive motion segments, the majority of the NSs chose to skip the segment of jumping down from the desk, and the segment of running out of the classroom was almost always included. It seems that the boy’s leaving the room marked a change of focused space, and thus the event was conceptually more salient than the previous motion segment of the boy’s jumping down from the table. Consequently, both of the NS groups tended to leave out the segment of jumping down.

On the other hand, the mean number of motion verbs used in these three event segments reveals that the English NSs did not consistently use a motion verb for each of the path segments supplied, as the Chinese NSs did. As a result, the mean ratio of the number of

motion verbs to the number of path components for the English NSs was 0.9, significantly lower than that for the Chinese NSs at 1.0, $U = 481$, $z = -3.105$, $p < .05$, $r = .35$.

Echoing the results of the encoding of ground elements, inspection of the NSs' narration of the consecutive motions, again, showed intra-typological differences in the syntactic features of satellites between English and Chinese. Consider examples (20a) and (20b), extracted from the English NSs' data:

- (20) a. *He ran **out into** the hallway, **back down** the stairs.*
b. *The boy rushed **outside** of the classroom, **down** the stairs, and **back outside** the school.*

As shown in these two examples, English motion constructions allow narrators to stack several different path components onto one motion verb. Such linguistic strategies, however, are not acceptable for Chinese motion constructions. A separate motion verb is needed for each path segment in Chinese, and the number of ground elements allowed per motion construction is restricted to one at most. In sum, the ways in which English and Chinese NSs described consecutive motions and encoded path and ground elements were mainly influenced by the language-specific syntactic properties of motion constructions in each respective language.

Additionally, further examination of the motion verbs supplied by the NSs to describe these three consecutive motion segments showed that English NSs used manner verbs 87% of

the time and path verbs 13% of the time. The Chinese NSs demonstrated very similar proportions of use of manner verbs and path verbs (86% vs. 14%). Narrowing this down to the consecutive motion segments, again, both the English and Chinese displayed preferences for encoding manner information via the main verb slots, leaving path information outside via the satellites, suggesting a clear S-frame tendency.

6.3.2 Motion Events in L2 Narratives

6.3.2.1 Total Clauses and Motion Clauses

With respect to the L2 learners' use and acquisition of motion expressions, I will first present analysis of the total clauses and motion clauses produced by the different learner groups.

Figure 2 Mean numbers of total clauses and motion clauses

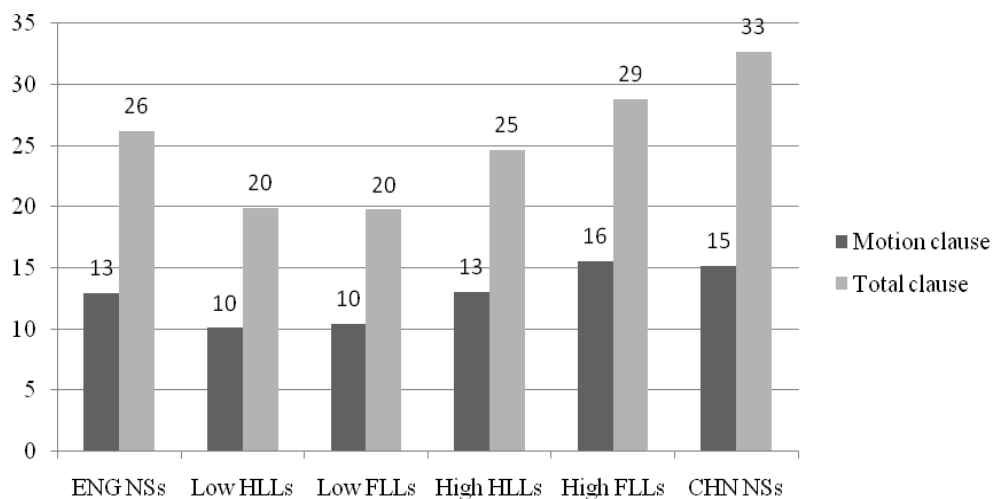


Figure 2 summarizes the mean numbers of motion clauses and total clauses used across all L2 groups and NS groups. As can be seen in Figure 2, both HLLs and FLLs at the higher proficiency level were capable of producing more clauses in total and more motion

clauses when describing the picture story, coming closer to the Chinese NSs' production. This suggests that the L2 learners' abilities to produce a longer narrative and to use motion language were positively related to their proficiency level. Analysis of the correlation coefficient between learners' EI scores and the numbers of total clauses using Spearman's rho confirms a strong positive correlation between the two variables, $r = .512$, $n = 80$, $p < .001$. A strong positive correlation between learners' EI scores and the numbers of motion clauses produced was also observed, $r = .531$, $n = 80$, $p < .001$.

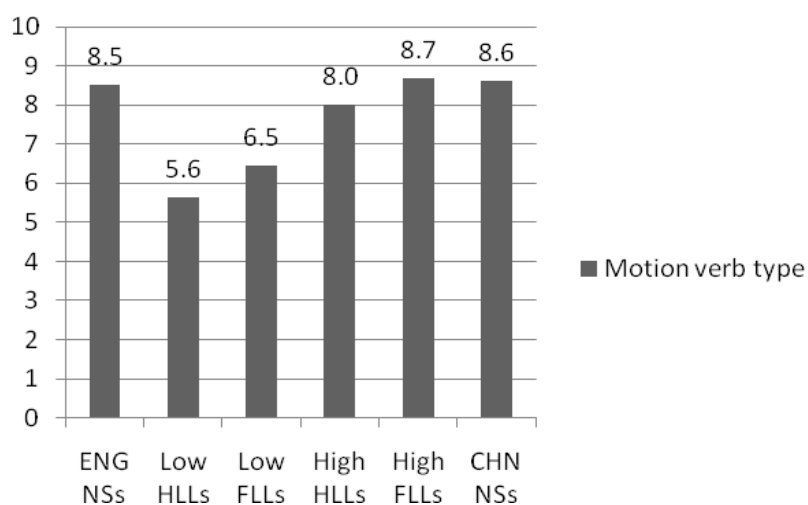
The importance of proficiency but not background was further supported by the results of the inferential comparisons. There was a significant difference in the total numbers of clauses produced across the four groups, $X^2(3, 80) = 16.012$, $p = .001$, $\eta^2 = .203$. Post-hoc pair-wise comparisons showed that high-proficiency FLLs ($M = 29$) produced significantly more clauses than low-proficiency FLLs ($M = 20$), $U = 78$, $z = -3.151$, $p < .05$, $r = .498$. The high-proficiency HLLs ($M = 25$) also produced more clauses than their low-proficiency counterparts ($M = 20$), $U = 103$, $z = -2.247$, $p < .05$, $r = .355$. No significant differences were found between the HLLs and FLLs at the same proficiency level (Low HLLs vs. Low FLLs, $p = .820$; High HLLs vs. High FLLs, $p = .099$). Comparison of the number of motion clauses produced also revealed a significant difference across the four learner groups, $X^2(3, 80) = 21.136$, $p < .001$, $\eta^2 = .268$. The high-proficiency FLLs ($M = 16$) produced significantly more motion clauses than did low-proficiency FLLs ($M = 10$), $U = 65$, $z = -3.523$, $p < .05$, $r = .557$.

The same pattern was found between high-proficiency HLLs ($M = 13$) and low-proficiency HLLs ($M = 10$), $U = 85.5$, $z = -2.753$, $p < .05$, $r = .435$. Again, no significant differences were found between the HLLs and FLLs at the same proficiency level (Low HLLs vs. Low FLLs, $p = .691$; High HLLs vs. High FLLs, $p = .071$). In terms of the ratios of motion clauses to total clauses, no significant differences were found among the learner groups, $X^2(3, 80) = 1.145$, $p = .766$, $\eta^2 = .014$.

6.3.2.2 Type-Token Analysis of Motion Verbs

The first analysis pertaining to the L2 learners' use of motion verbs was to examine whether the learners developed a larger motion verb repertoire as they attained higher level of L2 proficiency. Figure 3 shows the mean numbers of motion verb types used by each group of participants. The NS groups' data reported in the preceding section were presented here to serve as a basis for comparisons among groups.

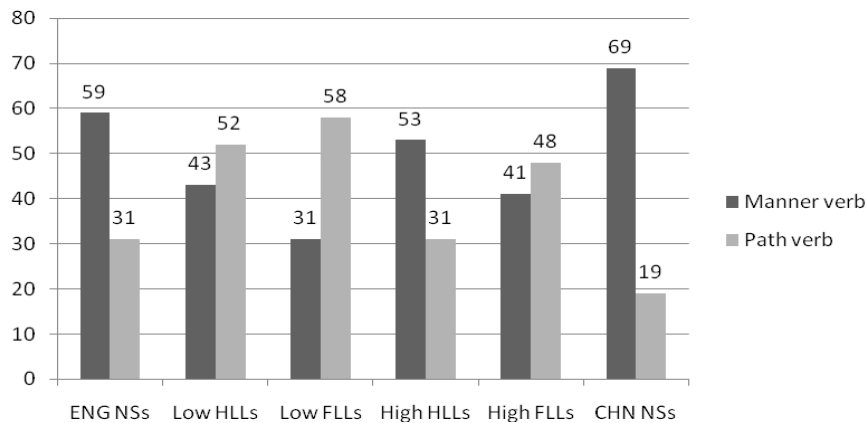
Figure 3 Mean numbers of motion verb types



There was a significant difference in the numbers of motion verb types used across the four learner groups, $X^2(3, 80) = 16.615, p < .05, \eta^2 = .21$. Post-hoc pairwise comparisons showed that high-proficiency learners for both the HLLs and FLLs used significantly more types of motion verbs than did their respective low-proficiency counterparts (Low FLLs vs. Low FLLs, $p < .0125$; High HLLs vs. High HLLs, $p < .05$), and no significant difference was found between HLLs and FLLs at the same level (Low HLLs vs. Low FLLs, $p = .349$; High HLLs vs. High FLLs, $p = .361$). A strong positive correlation between the learners' EI scores and the numbers of motion verb types produced further confirms that the learners developed a larger motion verb lexicon as they became more proficient in the L2, $r = .511, n = 80, p < .001$.

Turning to the use of motion verb tokens, Figure 4 shows the mean percentage distributions of manner verbs and path verbs for each participant group. A closer examination of the motion verb tokens revealed a surprising result, in which learners did not prefer to use manner verbs to describe motion events, as did the English NSs and Chinese NSs. Instead, a V-framed encoding preference in which path information was encoded via the main verb was observed in the data produced by the low-proficiency FLLs and low HLLs, as well as the high-proficiency FLLs. Only high-proficiency HLLs demonstrated an S-framed tendency by using more manner verbs than path verbs.

Figure 4 Mean percentage distributions of manner verbs and path verbs



As can be seen in Figure 4, high-proficiency FLLs used more manner verbs to describe the motion events, fully 41% of the time, as compared to low-proficiency FLLs at 31%, which suggests that the FLLs were gradually aligned with L2 encoding preferences by using more manner verbs. Nevertheless, high-proficiency FLLs overall still chose to use path verbs more frequently than manner verbs. No statistically significant difference was found between the percentage use of manner verbs between the high-proficiency and low-proficiency FLLs, $U = 135$, $z = -1.575$, $p = .115$, $r = .249$. By contrast, comparison of the percentage use of manner verbs between high-proficiency HLLs ($M = 53\%$) and low-proficiency HLLs ($M = 43\%$) showed a significant positive difference, $U = 111$, $z = -2.016$, $p < .05$, $r = .319$. The high-proficiency HLLs used not only manner verbs more frequently than did the low-proficiency HLLs, but also demonstrated an L2-like TFS by using more manner verbs than path verbs. A significant difference in use of manner verbs was also found between high-proficiency HLLs and FLLs, $U = 104$, $z = -2.696$, $p < .05$, $r = .426$. In sum, the high-proficiency HLLs differed from the other L2 groups in terms of whether they

showed an L2-like TFS pattern, whereby manner information is predominately expressed via main verbs.

The L2 learners' surprising preferences for encoding path via the main verb was neither L1-like nor L2-like. Note that the Chinese path verbs overlap with the path satellites (i.e., DCs). The high percentage use of path verbs by the L2 learners showed that they were comfortable with using the set of path morphemes as full path verbs. This tendency seems to have to do with the learner's construal of the syntactic role of the path morphemes. If the learners tended to construe the set of path morphemes as full verbs rather than satellites, this could explain why the percentage use of manner verbs was low in the learners' datasets. That is, when the learners tended to construe the set of path morphemes as full path verbs, the main verb slots could therefore be more likely to be filled with path verbs in order to encode the core path information, resulting in the low percentage use of manner verbs. Analysis of the distribution of motion constructions presented in the next section will provide more details pertaining to this possibility and shed light on the learners' syntactic preferences for means of path encodings.

6.3.2.3 Motion Constructions

Table 23 presents the mean percentage distribution of the different categories of motion constructions used by the L2 learners and the Chinese NSs. The results again show that, while the Chinese NSs predominantly used the S-framed means to encode path via DCs,

the low-proficiency learners preferred the V-framed encoding options (i.e., “Path V only” and “Path V + DC *lái/qù*”) via path verbs. Specifically, the low-proficiency HLLs used “Path V only” and “Path V + DC *lái/qù*” constructions together 52% of the time, and the low-proficiency FLLs did so at 59%. Compared to their use of V-frame strategies, their use of S-frame means was at much lower rate. The low-proficiency HLLs encoded path via “Manner/Neutral Verb +DC1 + (DC2 *lái/qù*)” constructions only 26% of the time, and the low-proficiency FLLs 17% of the time.

Table 23 Distribution of Motion Constructions: mean values

Group	N	Manner/Neutral V + DC1 + (DC2 <i>lái/qù</i>)	Manner V only	Path V only	Path V + DC <i>lái/qù</i>	Token
NSs	40	63%	17%	13%	7%	547
Low						
HLLs	14	26%	22%	39%	13%	135
FLLs	24	17%	24%	42%	17%	232
High						
HLLs	26	43%	24%	20%	13%	312
FLLs	16	33%	18%	21%	28%	223

The high-proficiency groups overall were more aligned with the S-framed patterns by using more “Manner/Neutral Verb +DC1 + (DC2 *lái/qù*)” constructions. The high-proficiency HLLs increased this ratio to 43%, coming closest to the Chinese NSs among all L2 groups. A significant difference in the percentage use of “Manner/Neutral Verb +DC1 + (DC2 *lái/qù*)” constructions was found between high-proficiency HLLs and low-proficiency HLLs, $U = 107$, $z = -2.130$, $p < .05$, $r = .337$. The high-proficiency FLLs also used significantly more

“Manner/Neutral V +DC1 + (DC2 *lái/qù*)” constructions than did the low-proficiency FLLs, $U = 87.5, z = -2.898, p < .05, r = .458$. However, note that the high-proficiency FLLs still demonstrated a rather high percentage use of path verbs. They used “Path Verb only” and “Path Verb + DC *lái/qù*” constructions 49% of the time, which outnumbered their percentage use of “Manner/Neutral Verb +DC1 + (DC2 *lái/qù*)” constructions at 33%. By contrast, the high-proficiency HLLs had used V-framed encodings only 33% of the time, which was lowered than their use of S-framed encodings at 43%. A marginally significant difference in the percentage use of “Manner/Neutral Verb +DC1 + (DC2 *lái/qù*)” constructions was found between high-proficiency HLLs and FLLs, $U = 138.5, z = -1.802, p = .072, r = .285$.

In sum, analysis of the learners’ use of motion constructions confirms that L2 learner groups, except high-proficiency HLLs, preferred to use a V-framed encoding option by encoding the path component in the main verbs. They were generally more reluctant to encode the path via DCs. This suggests that the same set of path morphemes that play dual syntactic roles in the L2 were more salient as path verbs rather than as path satellites in the learners’ developing L2 grammar. Although Chinese and English are both categorized as S-framed languages, characteristically using satellites to encode path information, the learners seemed to not interpret DCs as similar to the English VPs, but construed them more as full path verbs. Hence, they abstained from transferring the S-framed path encoding strategy from their L1, leading to surprising V-framed patterns that were neither L1-like nor

L2-like. On the other hand, because the DCs in the “Manner/Neutral V +DC1 + (DC2 *lái/qù*)” constructions and the path verbs in the “Path Verb only” and “Path Verb+DC *lái/qù*” constructions are basically the same set of path morphemes, in terms of L2 processing load, the “Manner/Neutral V +DC1 + (DC2 *lái/qù*)” constructions represent more complex constructions, which encode not only the path component but also manner information. This is likely to be another reason why the path verb constructions, which leave out manner encoding, were favored by the learners, especially for low-proficiency learners who had relatively limited L2 processing capacity.

6.3.2.4 Path and Ground Encodings

The results of ground encodings per motion clause produced by the learner participants and the NSs are presented in Table 24. As can be seen in this table, the distribution of ground encodings across all learner groups generally patterns with that found in the Chinese NSs’ data.

Table 24 Mean percentage distribution of encoding for ground elements

Group	N	Number of ground elements			
		0	1	2	3
ENG NSs	40	34%	58%	7%	2%
CHN NSs	40	32%	68%	0%	0%
Low					
HLLs	14	33%	67%	0%	0%
FLLs	24	39%	61%	0%	0%
High					
HLLs	26	32%	65%	1%	0%
FLLs	16	46%	54%	0%	0%

The L2 learners, regardless of their proficiency level, chose to encode one ground element most of the time, just as did the Chinese NSs. Inspection of the two-ground clauses produced by the high-proficiency HLLs showed that the additional ground elements were all introduced by use of the preposition 從 *cóng* ‘from,’ which marked the source point of the movement. By and large, the learners conformed to the Chinese language’s syntactic restrictions on the encoding of ground elements.

Although the learners’ choices for when or how to supply reference points were parallel with the tendencies of Chinese NSs, scrutiny of their linguistic strategies for encoding ground elements showed that the low-proficiency HLLs and FLLs tended to use a non-target-like mixture of the preposition *zài* and another motion construction to encode the ground element. Consider the following examples:

- (21) *a. 小 白 去 在 房 間 。 (low-proficiency HLL)
Xiǎo Bái qù zài fángjiān.
 Little Bai go **in** room
 ‘Little Bai went in the room.’

Chinese NSs’ response:

小 白 走 進 房 間 。
Xiǎo Bái zǒu jìn fángjiān.
 Little Bai walk **into** room
 ‘Little Bia walked into the room.’

- *b. 他 跳 在 桌 子 上 。 (low-proficiency FLL)
Tā tiào zài zhuōzi-shàng.
 he jump **on** table-top
 ‘He jumped on the top of the table.’

Chinese NS's response:

他 跳 到 桌子上。
Tā tiào dào zhuōzi-shàng.
He jump **to** table-top
'He jumped onto the table.'

*c. 小 林 跳 上 在 桌子上。 (low-proficiency HLL)
Xiǎo Lín tiào shàng zài zhuōzi-shàng
Little Lin jump up **on** table-top
'Little Lin jumped up on the top of the table.'

Chinese NS's response:

小 林 跳 上 桌子。
Xiǎo Lín tiào shàng zhuōzi
Little Lin jump **up** table
'Little Lin jumped up on the table.'

Examples (21) illustrate cases where the learners used the preposition *zài* to mark the goals of the motions, such as *fángjiān* 'room' in (21a) and *zhuōzi-shàng* 'desk-top' in (21b) and (21c). For these motion events, the Chinese NSs would typically use DC constructions to link up the ground element; in these cases, they would use the DC *jìn* 'into' for (21a), *dào* 'to; arriving a point' for (21b), and *shàng* 'up' for (21c). These non-target-like motion patterns clearly show that the learners treated the Chinese preposition *zài* as an equivalent of the English prepositions *in* and *on*, and intended to use *zài*, instead of the DC constructions, to mark the goal NPs. Such non-target-like patterns resembled their L1 English motion constructions. These low-proficiency learners' preferences for using *zài* to mark ground NPs were very likely influenced by their L1 TFS. This suggests that *zài* constructions, which are typically taught before the DC constructions and are more L1-like, seemed to represent a

more salient and straightforward linguistic means for encodings of grounds in the learners' developing grammar.

With respect to the learners' use of deictic encodings, Table 25 presents the percentages of deictic encodings that were realized by means of complex DCs.

Table 25 Use of deictic encodings via complex DCs: mean values

Group	N	Deictic encodings via complex DCs
NSs	40	61%
Low		
HLLs	14	3%
FLLs	24	10%
High		
HLLs	26	39%
FLLs	16	30%

Low-proficiency learners' use of deictic expressions was mostly conveyed by means of deictic morphemes that were used as path verbs, viz. 來 *lái* 'come' and 去 *qù* 'go,' rather than as DCs. Given that the deictic path verbs *come* and *go* exist in both the learners' L1 and L2 and in many other languages in the world, then, in order to explore how well the learners were capable of encoding deictic paths in a target-like manner, it is crucial to examine their use of the L2-specific deictic encoding means, namely, the use of DC2 in complex DCs. As can be seen in Table 25, the low-proficiency learners' percentage use of deictic encodings via complex DCs was low. The HLLs used complex DCs only 3% of the time, and the FLLs only 10% of the time. It is clear that the complex DC patterns had not yet been fully acquired by low-proficiency learners, including both FLLs and HLLs.

High-proficiency learners, by contrast, displayed mean percentage use of complex DCs at rates that were much higher than those produced by the low-proficiency learners. HLLs displayed 39%, which was higher than the FLLs at 30%, although the percentage use of deictic encodings by means of complex DCs was still much lower than that supplied by the Chinese NSs. These results suggest that high-proficiency learners had developed the capacity to allocate attentional resources to the direction of the motion and to deictic relationships during online processing and were more capable of adjusting themselves to L2-specific ways of TFS in path encodings. In this aspect, the high-proficiency HLLs were more aligned with the Chinese NSs than were their FLL counterparts.

Another aspect pertaining to the use of deictic encoding is that the learners sometimes failed to properly utter deictic expressions in pragmatically appropriate ways that fit the L2 Chinese conventions, as in example (22):

- (22) 他 踢 過去， 然後 小狗 把 球 送 過去。(high-proficiency FLL)
Tā tī guò-qù, ránhòu xiǎogǒu bǎ qiú sòng guò-qù.
 he kick over-**thither** then puppy BA ball deliver over-**thither**
 ‘He kicked the ball away, and then the dog took the ball over there.’

Here, the use of the thither path marker *qù* in the second clause was non-target-like and should be replaced by the hither path marker *lái*. The first thither path marker *qù* in the first clause of (22), however, was appropriate. The movement of the ball caused by the force of kicking was directed away from the deictic center *he* (i.e., the boy). After the boy kicked the ball away, the picture story showed that the boy’s dog brought the ball back to him, in

which the ball was moving toward the boy, who still serves as deictic center, and thus should be coded by the hither path *lái*. The learner's misuse of *qù* for *lái* created an additional and unnecessary spatial relation, in which the second thither path *qù* implied that the dog delivered the ball to a place that was even farther away from the boy.

The non-target-like misuse of *qù* for *lái* or *lái* for *qù* and the relatively low percentage use of deictic encodings via complex DCs revealed that learning to express L2 Chinese deictic paths in a target-like manner posed considerable challenge for the learners. Properly uttering deictic expressions involves several dimensions of simultaneous processing (Hanks, 1996, 2009). The speaker needs to resort to perception, proximity, and ongoing interaction in the context. The results suggest that it may take longer for the learners to internalize such context-dependent expressions during their online L2 TFS.

6.3.2.5 Descriptions of Consecutive Motions

The final analysis conducted on the L2 datasets focused on the learners' linguistic strategies for describing the three consecutive motion segments, including the boy's jumping off/down from the table and his running out of the classroom and going down the stairs.

As can be seen in Table 26, low-proficiency learners encoded fewer path components and used fewer motion verbs to describe these three event segments than did their high-proficiency counterparts. The lower-proficiency learners' choice to encode less

information could be attributed to their relatively more limited ability to express motion events. By contrast, high-proficiency learners displayed patterns of motion descriptions in terms of path components and motion verbs that were similar to those of the NS groups.

Table 26 Descriptions of consecutive motions: mean values

Group	N	Number of path components	Number of motion verbs	Ratio
ENG NSs	40	2.0	1.8	0.9
CHN NSs	40	2.1	2.1	1.0
Low				
HLLs	14	1.2	1.3	1.1
FLLs	24	1.2	1.4	1.2
High				
HLLs	26	1.7	1.7	1.0
FLLs	16	2.1	2.1	1.0

Among the three event segments, the learners tended to skip the jumping down segment and retain the segment of running out of classroom, as did the NSs. This suggested that the L2 learners and the two NS groups alike viewed the main character's running out the classroom as conceptually the most salient event, potentially because this segment marked a change of focused space from inside to outside of the classroom.

On the other hand, while the English NSs had a ratio of motion verbs to path components that was lower than 1.0, due to the linguistic means of attaching stackable satellites to single motion verbs, the low-proficiency learners, including both HLLs and FLLs, actually supplied more motion verbs than path components. Qualitative inspection of this

phenomenon showed that higher mean numbers of motion verbs were generated because some learners used only manner verbs to describe such segments, leaving out the core path components, as illustrated in (23):

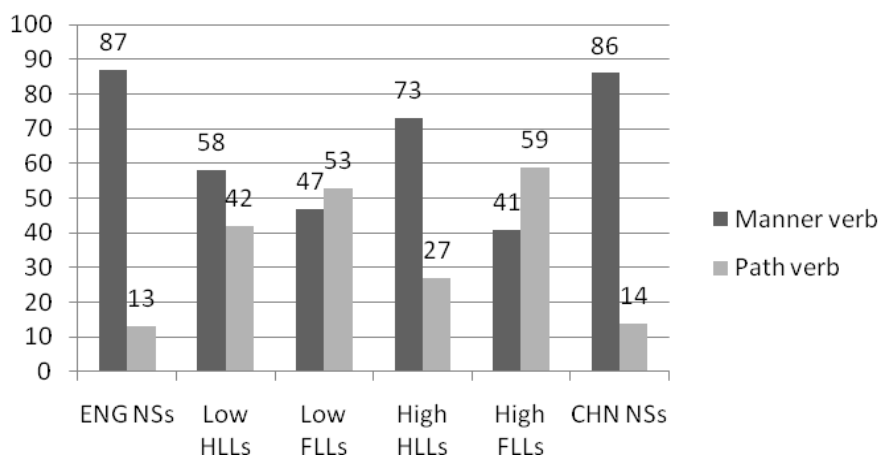
- (23) *他 跑 出去 教室， 還有 下， (low-proficiency FLL)
Tā pǎo chū-qù jiàoshì, hái yǒu xià,
he run out-thither classroom also descend
'He ran out of the classroom, also descended,

走， 再 跑 石階。
zǒu, zài pǎo shíjiē.
walk then **run** stairs
walked, and then ran (down) the stairs.'

These learners used multiple motion verbs to describe the consecutive motion segments, in this example, with two manner verbs *zǒu* 'walk' and *pǎo* 'run' used alone without path specifications, revealing they were making maximal use of their available L2 resources to describe the motion scene. Such linguistic strategy consequently gave rise to the higher number of motion verbs than path components. Overall, L2 learners' use of path components conformed to the requirements of L2 patterns. No non-target-like stackable DCs were found.

Finally, Figure 5 presents the proportions of manner verbs and path verbs that were employed by all groups of participants to describe the consecutive motions.

Figure 5 Proportions of manner verbs and path verbs
in descriptions of consecutive motions



The patterns of participants' use of motion verbs generally confirmed earlier observations that a V-framed strategy was frequently adopted by the L2 learners.¹⁷ As can be seen in Figure 5, except for the high-proficiency HLLs, the percentage use of path verbs for all L2 groups was higher than that used by the English and Chinese NSs. The learner participants were more likely to leave out the manner information, encoding only the path component in the main verb. The high-proficiency HLLs, again, demonstrated an S-framed pattern that was most similar to the pattern found for the Chinese NSs. They used manner verbs to describe the consecutive motions 73% of the time.

¹⁷ Comparison of the results obtained in this analysis with those obtained from the analysis conducted on all motion verbs (see Figure 4) indicated that the percentage use of manner verbs for the low-proficiency HLLs and FLLs was relatively higher in this analysis. Note that the percentage use of manner verbs for the low-proficiency learners could be skewed due to the aforementioned dangling manner verbs, which appeared alone without path specifications.

6.4 Discussion

The results of the oral narrative task indicated that high-proficiency learners, including both HLLs and FLLs, outperformed their low-proficiency counterparts in producing more motion clauses, using more versatile motion verbs, and employing motion constructions and path descriptions in ways that were more closely aligned with the Chinese NSs. However, except for high-proficiency HLLs, the L2 learners showed surprising preferences for encoding path in the main verb, demonstrating patterns of V-framed TFS that were neither L1-like nor L2-like.

Although Chinese and English are both categorized as S-framed languages that characteristically use satellites to encode the path information, the learners seemed to not construe DCs as similar to the English VPs, but recognized them more as full path verbs. The main verb slots were therefore more likely to be filled in with path verbs, which consequently resulted in the V-framed patterns that were distinct from those of the learners' L1 or the L2.

On the other hand, it was observed that L2 learners' preferences for using path verbs to describe motion events were likely to be related to ease of online processing. Because the DCs in the "Manner/Neutral V +DC1 + (DC2 *lái/qù*)" constructions and the path verbs in the "Path Verb only" and "Path Verb + DC *lái/qù*" constructions are basically the same set of path morphemes, in terms of L2 processing load, producing the "Manner/Neutral V +DC1 + (DC2 *lái/qù*)" constructions requires extra processing, as such strategies encode not only the

path component but also the manner information. In this respect, low-proficiency learners, who had relatively limited L2 processing capacity, were found to have the lowest percentage use of the “Manner/Neutral V +DC1 + (DC2 *lái/qù*)” constructions. Only high-proficiency HLLs showed L2-like TFS, choosing to encode motion events via the “Manner/Neutral V +DC1 + (DC2 *lái/qù*)” constructions most of the time. Additionally, high-proficiency HLLs, as compared to the other L2 groups, also demonstrated the most advanced skills in encoding deictic paths via complex DC patterns. Overall, faced with the intra-typological differences between the L1 and the L2, the high-proficiency HLLs’ performance in this oral narrative task indicated that their L2 TFS was the most target-like.

The results of the analysis presented in this chapter suggest a limited role for learners’ L1 TFS. In learning to describe motion events in the L2, learners’ construal of L2 path morphemes and their L2 processing capacity for handling patterns that are syntactically and semantically more complex seems to outweigh the influence of the learners’ L1 TFS. In the next chapter, I will focus on the learners’ performance in online processing for L2-specific encoding of the hither/thither paths, which target another aspect of the L2 development, namely, “listening for imaging.”

CHAPTER 7 LISTENING FOR IMAGING

7.1 Background

The results discussed in the preceding two chapters have examined learners' development of L2 productive skills when expressing motion events. Turning to their L2 receptive skills when listening to comprehend motion language, this chapter presents results of the online judgment task, which was designed to investigate how well the learners were able to process L2-specific deictic paths in a target-like manner. The results of the picture-cued written task and the oral narrative task have showed that the L2 learners were more or less able to produce the deictic DCs *lái* 'moving toward the speaker' and *qù* 'moving away from the speaker.' However, it remains unclear whether they can automatically picture the spatial relationships denoted by deictic DCs when comprehending motion sentences online. When Chinese NSs hear the motion expression 跑-進-來 *pǎo-jìn-lái* 'run-into-**hither**,' they can easily picture a moving figure running into a space, with the movement being directed toward the hearer. That is, Chinese NSs could for example quickly imagine that they are inside the classroom, because the deictic hither path *lái* has provided a spatial hint to which they are highly sensitive in their L1 TFS. By contrast, hearing the motion expression 跑-進-去 *pǎo-jìn-qù* 'run-into-**thither**' causes them to imagine that the moving figure is running into a classroom that is relatively far away from where they are. In this case, the hearer easily imagines that they are outside the classroom. The questions that

arise, then, are: how sensitive are L2 learners to deictic spatial cues, and can they quickly locate their position relative to a moving figure according to such deictic cues in their spatial imagery, as do Chinese NSs?

Slobin (2003) refers to this kind of language-imagery interface as “reading/listening for imaging,” a mode of TFS phenomena. Speakers of typologically different languages construct different mental representations for the same motion events (Oh, 2003, 2008; Slobin, 2003). Slobin (2003) demonstrated that English speakers were inclined to report mental imagery for the protagonist’s manner of movement, whereas Spanish speakers reported little or no imagery for manner, after reading identical passages depicting motion scenes. With respect to online processing of Chinese deictic DCs, Chinese NSs habitually produce mental imagery of deictic relations in their L1 TFS. However, such L2-specific patterns of spatial imagery present unfamiliar thinking patterns for L1 English learners of Chinese. Hence, using simulation-based experimental methods, the online judgment task was intended to explore: (a) the extent to which L2 learners ran mental simulations when comprehending motion sentences that contained the Chinese deictic DCs *lái* ‘moving toward the speaker’ or *qù* ‘moving away from the speaker’ and (b) how such simulation phenomena might relate to participants’ Chinese proficiency levels or language backgrounds. Based on comparisons between the Chinese NSs and the L2 learners, the results can provide a fine-grained analysis of learners’ performance in listening-for-imagery.

7.2 Method

Partially replicating Kaschak et al. (2005), the design of this online judgment task tapped the interference effect that arises when simultaneously processing linguistic stimuli and perceiving visual stimuli. Participants listened to Chinese motion sentences describing events that involved movement in a direction that could easily be interpreted as either toward or away from themselves (see examples 23a and 23b) while simultaneously watching a black-and-white motion percept (see Figure 6 for a static screenshot). The participants' task was to decide whether or not the sentence they heard made sense. They pressed a key labeled "Y" if the sentence made sense, or pressed a key labeled "N" if the sentence did not make sense. They were told that their responses would be timed and they should respond as quickly as possible while still maintaining accuracy.

(24) a. Toward-sentence

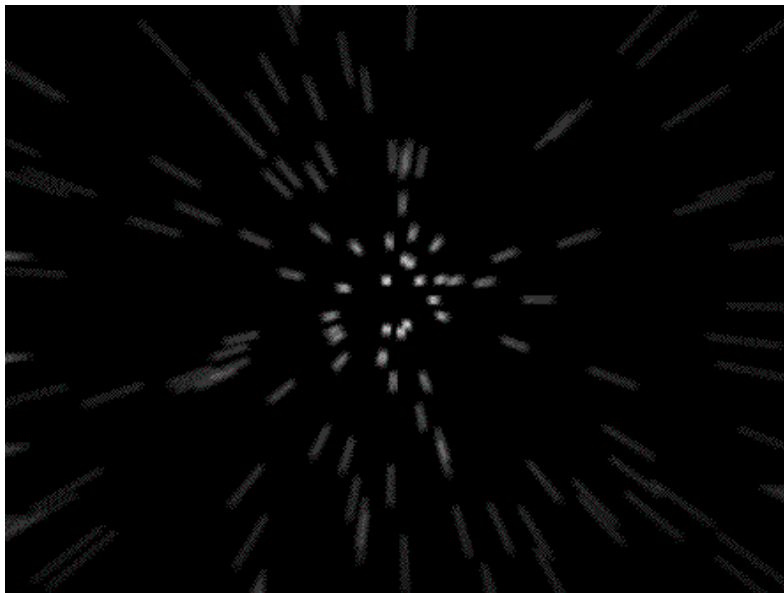
車子 開 過 來 了。
Chēzi kāi guò lái le.
car drive over hither Perf.
'The car is approaching.'

b. Away-sentence

車子 開 過 去 了。
Chēzi kāi guò qù le.
car drive over thither Perf.
'The car is moving away.'

Examples (24a) and (24b) are one of the 16 pairs of critical sentences used in this experiment. In each pair, the two sentences differed only in the use of the deictic DCs *lái* or *qù*, which resulted in a contrast in directionality for moving either toward or away. All of the critical sentences were controlled so as to be between 6 to 9 syllables in length and were composed of vocabulary that was judged appropriate for the L2 learners' proficiency levels. A complete list of the critical toward- and away-sentences is provided in Appendix G.

Figure 6 Visual Percept for toward- and away-displays



The motion percept was intended to convey a sense of objects moving either toward or away from the participants. The toward-percept was constructed by presenting an image of a sky filled with shooting stars moving from the center to the boundaries, and the away-percept was created by reversing the timeline of the presentation, which resulted in the image of stars moving from the boundaries to the center. Each percept was displayed using a resolution of 450 x 338 pixels at a rate of 15 frames per second.

A match condition was produced when the sentence described motion in the same direction as the motion depicted in the percept. In contrast, a mismatch condition was generated when the sentence described motion in a direction opposite to that depicted in the percept. The prediction was that participants would take longer to decide whether the sentence made sense in a match condition than in a mismatch condition. This interference effect is expected since the simultaneous presentations of the percept and the sentence involving the same directionality required the same neural structures to process multiple tasks simultaneously, leading to interference between the two tasks (see discussion in Bergen, 2007 and Kaschak et al., 2005). For the L2 learner participants, if they were sensitive to the deictic cues and were able to simulate the toward- and away-imagery, they would show the same patterns of reaction times as the Chinese NSs in their online L2 listening-for-imagery performance.

In order to disguise the critical sentences, 24 filler sentences, including 12 sensible sentences and 12 non-sensible sentences (see examples 25 and 26), were included in this experiment. The filler sentences were similar to the critical sentences in length and level of difficulty for vocabulary.

(25) Sensible filler sentence

這 套 公 寓 很 漂 亮 。
Zhè tào gōngyù hěn piàoliang.
this CL. apartment very beautiful
'This apartment is very beautiful.'

(26) Non-sensible filler sentence

電影 去 打球 了。
Diànyǐng qù dǎ-qiú le.
movie go play-ball Perf.
'The movie has left to play ball.'

The experiment was conducted in four blocks, with each block having 10 sentences, including 4 critical sentences (2 toward- and 2 away-sentences) and 6 fillers (3 sensible and 3 non-sensible sentences) that are presented via headphones, while simultaneously showing the toward- or away-visual percept. Participants were instructed to stare at the screen. A green fixation cross appeared before each block started, and a red fixation cross appeared after the block ended. A screen asking if the participant was ready for the next block appeared between the blocks. The participant then pressed any key to continue with the next block. During each block, the 10 sentences were presented with 4-second interval between sentence onsets for the Chinese NSs and with 7-second interval for the L2 learner participants. The learner participants were given more time given that L2 sentence processing can be expected to require more time than L1 processing. The length of the adjusted interval was determined through pilot tests conducted on both low- and high-proficiency L2 learners.

Four lists were generated, with lists 1 and 2 presenting the toward-percept and lists 3 and 4 presenting the away-percept. The 16 pairs of critical sentences and fillers were counterbalanced across lists. Participants were randomly assigned to one of the lists. A practice trial containing 5 sentences was given prior to the experimental blocks. The

participants had to respond correctly for all five practice sentences before they were allowed to proceed to the experimental blocks. Reaction times were measured and compared between the matching and non-matching conditions and among different groups, and accuracy for each sentence was also recorded. The 40 Chinese NSs spent about 5-7 minutes completing the experiment, and the 80 learner participants spent about 8 to 10 minutes.

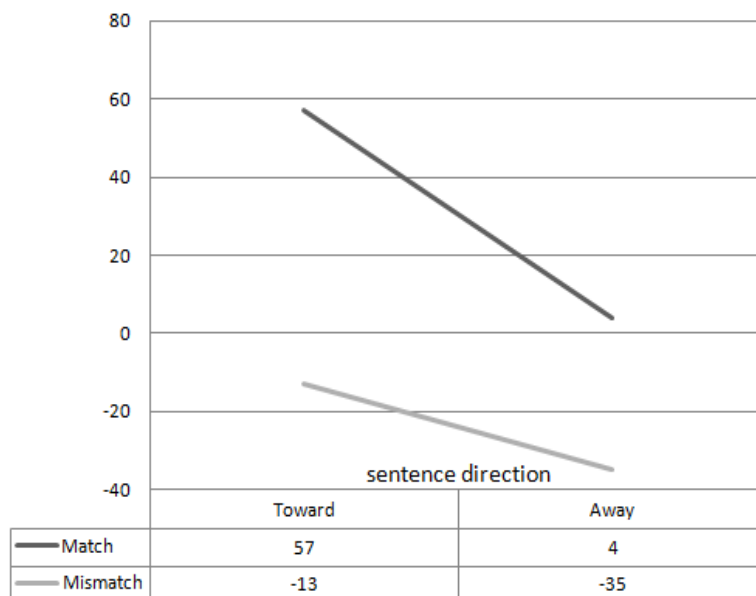
7.3 Analysis and Results

7.3.1 L1 Patterns of Simulation

The reaction times were calibrated. A calibrated value of 0 ms was generated when a response occurred at the end of the sentence. A calibrated negative reaction time was generated when a response was made before the sentence ended, and a calibrated positive reaction time was when a response was made after the sentence ended. The following procedures were adopted to eliminate outliers. First, participants were checked for having accuracy rate lower than 80% or having mean reaction times that were more than 2.5 standard deviations from all participants' mean reaction times. No participants were excluded due to these criteria. Next, incorrect responses were excluded. Responses that were more than 2.5 standard deviations from the mean for each participant were also removed. These two procedures led to the exclusion of less than 5% of the data. The average accuracy rate for all responses was 95.93%.

The remaining response times were submitted to a 2 (Sentence Direction: Toward vs. Away) x 2 (Compatibility: Match vs. Mismatch) repeated measures ANOVA¹⁸. Figure 7 presents the mean reaction times for each condition. The effect for sentence direction was not significant, $F(1, 39) = 3.771$, $p = .059$, partial $\eta^2 = .088$, suggesting the toward- and away-sentences were generally processed at the same speed. Responses were significantly faster when the direction implied by the visual percept did not match that of the sentence than when there was a match, $F(1, 39) = 6.160$, $p = .017$, partial $\eta^2 = .136$. There was no significant interaction between sentence direction and compatibility, $F(1, 39) = .392$, $p = .535$, partial $\eta^2 = .010$.

Figure 7 Mean reaction times for match and mismatch conditions and for up and down sentences: Chinese NSs



¹⁸ The two-way repeated measures ANOVA was used to determine whether the mean reaction times across the conditions (generated by the two factors: sentence direction and compatibility) differed significantly from one another (for more details, see Field, 2009).

These results are in agreement with Kaschak et al. (2005), supporting the predicted interference effects. When the Chinese NSs were asked to simultaneously process the visual percept and the motion sentence, they took longer to decide whether the sentence made sense when the visual percept and the sentence depicted motion of the same direction. This suggested that language comprehension requires the same general mechanisms that are used in perception of motion. The mental simulation activated by deictic cues is thus sensitive to the directional axis of toward-away. The Chinese NSs' automatic online construction of the mental simulations for the deictic cues shows that they are tuned to deictic DCs in their L1 listening-for-imagery.

7.3.2 L2 Patterns of Simulation

The L2 learners' responses were screened following the same outlier analysis procedures as was conducted on the L1 data. The results show that a portion of the L2 learners in each group had an accuracy rate that fell below the 80% accuracy threshold. Those learners' data were thus removed, because their responses suggested that there were other confounding factors that had influenced their performance on this experiment, which were beyond the focus of this study. Table 27 summarizes the results of the accuracy analysis.

Table 27 Outlier analysis: Accuracy rates for NS, HLL, and FLL participants

Group	N	Mean accuracy	Num. of participants above 80%
NSs	40	96%	40
Low			
HLLs	14	58%	2
FLLs	24	61%	4
High			
HLLs	26	80%	15
FLLs	16	81%	9

As can be seen in Table 27, only two HLLs and four FLLs from the low-proficiency groups had an accuracy rate above 80%, and the mean accuracy rates for the respective group fell below the 80% threshold. Even though the learner participants were given a longer interval of 7 seconds to determine whether the sentence was sensible, it appeared that the majority of the low-proficiency learners were unable to succeed in this task. This suggests either that the low-proficiency learners needed a longer time to process the meanings of the sentences or that the task required more advanced L2 listening skills than their current levels. On the other hand, the high-proficiency learners were more successful in this task. The mean accuracy rates for both HLLs and FLLs met the 80% threshold. But, still, a portion of the participants were excluded because they were below such threshold, which resulted in data from 15 HLLs and 9 FLLs from the high-proficiency groups.

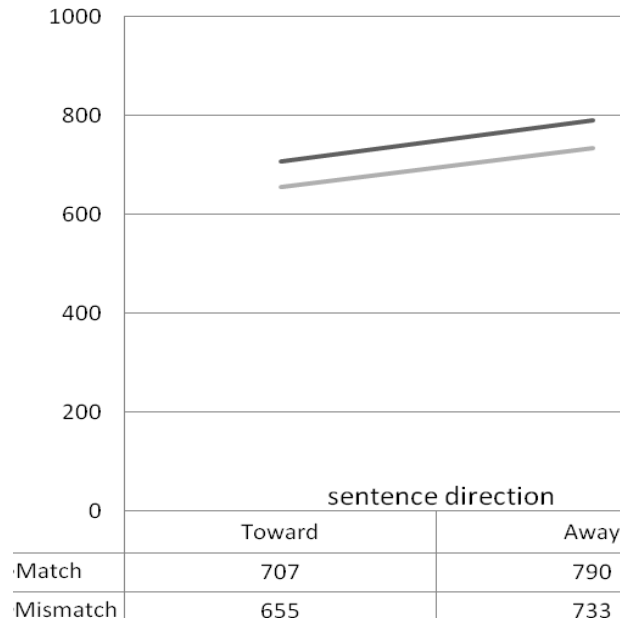
Because the numbers of the participants from the low-proficiency groups were not sufficient for an inferential analysis, the remaining participants from the two proficiency

levels were then merged into just two groups, namely, HLLs and FLLs. The new HLL group comprised 17 participants and the new FLL had 13. Among these participants, no one was excluded due to having a mean reaction time that was more than 2.5 standard deviations from the group mean. After removals of inaccurate responses and responses that were above 2.5 standard deviations from the participant's mean, the 9.55% of the data was removed for the HLL group, and the mean accuracy rate for the remaining data was 92.25%. The FLL group lost 9.1% of the data and had an adjusted mean accuracy of 91.35%.

The remaining responses for HLLs and FLLs were respectively submitted to a 2 (Sentence Direction: Toward vs. Away) x 2 (Compatibility: Match vs. Mismatch) repeated measures ANOVA to examine whether the interference effects could be found as observed in the NSs' data.

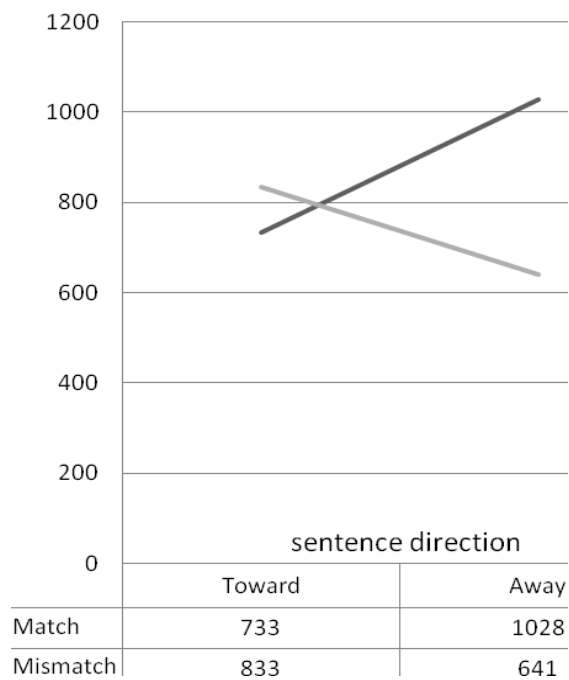
The results for HLLs are presented in Figure 8. The effect for sentence direction was not significant, $F(1, 16) = 1.899$, $p = .187$, partial $\eta^2 = .106$, nor was the effect for compatibility, $F(1, 16) = .316$, $p = .582$, partial $\eta^2 = .019$. There was no significant interaction between sentence direction and compatibility, $F(1, 16) = .002$, $p = .969$, partial $\eta^2 = .000$.

Figure 8 Mean reaction times for match and mismatch conditions and for up and down sentences: HLLs



Turning to the results for FLLs, Figure 9 presents the mean reactions for each condition. The effect for sentence direction was not significant, $F(1, 12) = .570$, $p = .465$, partial $\eta^2 = .045$, nor was the effect for compatibility, $F(1, 12) = 3.386$, $p = .091$, partial $\eta^2 = .220$. There was no significant interaction between sentence direction and compatibility, $F(1, 12) = 2.265$, $p = .158$, partial $\eta^2 = .159$.

Figure 9 Mean reaction times for match and mismatch conditions and for up and down sentences: FLLs



7.4 Discussion

Overall, as one may expect, comparisons of the mean reaction times showed that the L2 learners spent more time to make a response than did the Chinese NSs. However, neither the HLLs nor the FLLs showed patterns of interference effects as observed in the Chinese NSs' data, suggesting that, while these L2 learners were capable of judging whether the Chinese sentences were sensible or not, processing the deictic DCs *lái* or *qù* by listening did not trigger spatial imagery directed toward or away which could interfere with the simultaneous processing of the visual presentations. Given that the majority of the participants were from the high-proficiency groups, the L2 learners' online processes of listening-for-imagery seemed to indicate that they had not yet totally internalized the

L2-specific deictic paths in their L2 TFS, even with advanced proficiency. Nevertheless, caution must be made when interpreting the results. The lack of statistical significance for the compatibility factor could be attributed to the small number of participants who contributed data to the final analysis. Moreover, it was observed that, although the L2 learners were instructed to look at the computer screen while listening to the sentences, some of them occasionally avoided looking at the screen in order to better concentrate on listening to the Chinese sentences. Hence, whether the L2 learners were capable of simulating the deictic DCs online awaits further research.

The results of this online judgment task provide some suggestions for the future design of simulation-based experiments with L2 participants. First, simulation-based methodology uses reaction times to determine whether learners are engaging in online mental simulations of the content of the sentence, but low- or intermediate-proficiency learners may not be suitable for such designs, because their limited L2 processing abilities and varied L2 listening skills are very likely to complicate the results. Additionally, designs that are meant to elicit interference effects may present more of a challenge for L2 learners than designs that are meant to generate compatibility effects. This is because the processing of L2 linguistic stimuli and performance of another perceptual or motor task at the same time, as required in an interference design, consumes more attentional resources than what is required in a compatibility design, in which the two tasks do not overlap temporally. Thus, an

interference-based design may require participants with more advanced L2 processing skills.

As observed in this study, some L2 participants tended to shift their focus from one of the required tasks. It is therefore also important to videotape experiment sessions to keep track of participants' actual performance.

CHAPTER 8 GENERAL DISCUSSION AND CONCLUSION

This dissertation adopted a multi-task approach to comprehensively examine the use and acquisition of L2 Chinese motion expressions by English-speaking learners. Each of the three tasks discussed here have tapped into different modes of L2 TFS performance, including thinking-for-writing, thinking-for-speaking, and listening-for-imagery. The results of these experiments have shown that L2 speakers' development in learning to describe motion events in Chinese is influenced by factors including their L2 proficiency level, the degree of syntactic and semantic complexity of the L2 subsystems, construal of L2 motion constructions, and language background. These factors go beyond a simple dichotomy of L1 or L2 thinking and suggest a limited role for learners' L1 TFS.

First, learners' proficiency levels are closely linked to how well they can use motion expressions. The results of this study indicate that their ability to express motion events was positively correlated with their L2 proficiency levels. As they moved along to a higher proficiency level, they developed a larger motion verb lexicon and were more capable of using DCs to describe a variety of motion events. They also developed better L2 processing capacity to tackle complex structures, and their conceptualization of motion events was more aligned with Chinese NSs in many ways. Furthermore, more traces of L1 were found in the low-proficiency learners' L2 production, showing that low-proficiency learners were more likely to resort to L1 knowledge during L2 processing. For instance, they tended to treat the

Chinese preposition *zài* as equivalent to the English spatial prepositions *in/on/at* and thus overused *zài* to mark ground NPs, producing non-target-like forms that resembled L1 structures. Such linguistic phenomena were never found with the high-proficiency learners.

The results of this study also indicate that degree of both syntactic and semantic complexity of L2 subsystems can play an important role in learners' use and acquisition of motion expressions. For example, degree of syntactic complexity can influence ease of processing, as structures including complex DC patterns and the variable word order associated with their use posed considerable challenges for the learners. Complex DCs, compared to the simple DCs, require learners to allocate their attentional resources not only to orientation of the movement but also to deictic spatial relations. The dual nature path encoding in Chinese further increases processing load. The results of the oral narrative task also show that low-proficiency learners seldom used complex DCs to encode deictic paths, as compared to Chinese NSs at 61%, high-proficiency HLLs at 39% and FLLs at 30%. Instead, deictic expressions were mostly conveyed by means of the simple path verbs 來 *lái* 'come' and 去 *qù* 'go' by low-proficiency learners. Moreover, more non-target-like word orders were found with the complex DC patterns than with the simple DCs in the picture-cued written task across all L2 groups. These observations clearly show that the learners' use of motion expressions was largely driven by their L2 processing capacity. As noted by Van Patten (1996, 2004), L2 learners' processing capacity is limited and exhausts itself quickly.

Only certain features will receive attention at any given time. Complex subsystems require higher L2 processing capacity and are more likely to be acquired at a later stage of L2 learning.

In addition to the syntactic complexity of the L2, semantic complexity also influences L2 learning of motion expressions; those that encompass complex notions or spatial relations are more difficult to fully internalize. For example, more non-target-like solutions were found in the subtle distinctions between the two upward DCs, 上 *shàng* and 起 *qǐ*, and the DC 過 *guò*, which can be used to describe the spatial relations defined by the English satellites *across*, *past*, and *over*. Additionally, proper use of the deictic DCs, which involves several dimensions of processing pertaining to perception, proximity, and ongoing interaction in the context of utterance, was a challenge for the learners. The learners' use of deictic encodings, even for high-proficiency ones, was considerably lower than that of the Chinese NSs, and misuse of *lái* for *qù* or *qù* for *lái* was still observed in their use from time to time. The results of the online judgment task also indicated that high-proficiency learners' online thinking-for-imagery patterns remained non-target-like. In short, inherent L2 syntactic and semantic complexity may slow down the L2 development and shape the pathways and outcomes of L2 TFS performance.

Additionally, learners' construal of L2 motion structures outweighs the typological influences from L1 or L2. Given that English and Chinese are both categorized as S-framed

languages, if typological factors were paramount, one would be more likely to expect that L1 S-framed thinking may be easily transferred to their L2 production, in which the path components would be encoded via path satellites, namely, the DCs. However, the learners actually preferred V-framed encoding, showing that the set of path morphemes were not construed as satellites but as path verbs in the interlanguage system. These findings echo those of Wu (2011), in which it was found that learners tended to accumulate strings of DCs to describe consecutive movements as if they were constructing serial-verb constructions. Faced with the dual syntactic roles for Chinese path morphemes, learners seem not to interpret DCs as similar to English VPs, but instead construed them as path verbs. These phenomena suggest that learners' construal of Chinese path morphemes exercises a powerful effect on their L2 performance, resulting in abundant use of path verbs and frequent omission of manner components that are neither L1-like nor L2-like.

Last but not least, comparisons of the performance between the HLLs and FLLs reveal that heritage versus foreign language learning background, as operationalized in the study, plays an important albeit subtle role. In this study, the 26 high-proficiency learners were the only learner group that expressed motion events via S-framed encodings. They outperformed high-proficiency FLLs in their abilities to use the complex DCs such as 過 *guò* or deictic DCs. With similar global L2 proficiency, the reasons why the high-proficiency HLLs showed the most target-like L2 TFS in their use of motion expressions than their FLL

counterparts can be perhaps attributed to the greater access to participation in communicative practices which their background may have afforded them. Inspection of their background showed that high-proficiency HLLs reported frequently hearing Mandarin Chinese and/or another Chinese dialect or using it with their family, relatives, or friends outside the classroom. They also had an average of 2.43 years of time staying in a Chinese-speaking country. Note that different from their high-proficiency FLL counterparts whose periods of travel took place during or after their college years, these high-proficiency HLLs' travel experiences took place mostly at a young age, before puberty, and some of them even periodically traveled to visit their relatives. These two L2 exposure indices together suggested that they had more opportunities than the other learner groups to use motion language to interact and communicate with members of the L2 community in real-life situations.

Thus, internalization of motion language relies on embodied experiences, where concrete actions or movements are coupled with linguistic input to illustrate how the L2 organizes the spatial relations and directs its speakers to attend to dimensions of events or actions that are relevant and readily encodable in the L2 (Wu, 2011). That is, L2 acquisition of motion expressions at least partially involves the restructuring of L1 predispositions for spatial organization or event construal. Hence, pedagogical activities that provide abundant input, presented along with physical motions or requiring learners to actively use the motion

language in meaningful tasks, would be most effective in assisting them to adjust to such conceptual changes.

This large-scale study therefore suggests a new direction for future L2 TFS research. Recently, more and more L2 studies have explored the role of L1 TFS on L2 learning. Although the existing literature on L2 acquisition of motion expressions generally points to the potential influence of L1 TFS patterns on L2, the extent to which how L1 TFS plays a role in L2 performance seems to vary considerably across different studies. Research findings can be influenced by factors such as subjects' proficiency levels, modality of research operations, aspects of motion language studied, and the degree of typological differences and similarities between the target L1 and L2. The present study, which drew from 80 L2 Chinese learners' use of motion expressions at different proficiency levels and across different modalities, therefore, provides a more complete picture of the issues in question. Learning to express motion events in an L2 is affected by crosslinguistic differences in language-mediated concepts. This line of research manifests the importance of conceptual change and restructuring of L1-L2 differences in the habitual ways by which motion events are conceptualized. This layer of learning had been less explored in previous L2 studies. Nonetheless, the influence of L1 TFS, like other kinds of L1 transfer phenomena, are about tendencies and probabilities. As illuminated in this study, multiple factors, such as learners' proficiency level or their construal of the L2, can come into play to determine whether or

how L1 TFS affects the L2 learning outcomes. Likewise, how well learners are able to adjust to L2 TFS is also shaped by such variables. Therefore, stagnant learning progress for certain types of motion event expressions does not necessarily point to “results of L1 conceptual transfer,” “no signs of conceptual change,” or “no evidence of shift to the L2 TFS.” Such situations could instead be attributed to the inherent L2 complexity of the subsystem, which would therefore require a longer time to fully internalize it and could pose an equal challenge for learners with a typologically similar or different L1. It is important that variables besides L1 or L2 TFS be taken into consideration when interpreting such results. As Jarvis and Pavlenkon (2008) put it, conceptual changes in the course of L2 acquisition are dynamic and ongoing processes. More L2 research, reflecting a variety of L1-L2 typological differences, or examining different conceptual domains, is needed in order to better understand how learners come to categorize objects or events along the lines offered by the new language(s).

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APPENDIX A: MANDARIN ELICITED IMITATION TASK

Note. Items in this task were originally developed by Ortega et al. (2002). The Mandarin items were translated by Ying Zhou and author of this dissertation (2009) with minimal revisions for each item, when necessary to adjust the length of syllables or to more naturally reflect features of the Mandarin language in translation. Numbers in parentheses represent the total number of syllables included in each item.

1. 我得去剪頭髮了。(7)
I have to get a haircut. (7)
2. 紅色的書在桌子上。(8)
The red book is on the table. (8)
3. 這個城市街道很寬。(8)
The streets in this city are wide. (8)
4. 他每天早上都要洗澡。(9)
He takes a shower every morning. (9)
5. 我聽說明天可能會下雨。(10)
It is possible that it will rain tomorrow. (12)
6. 你剛才說你今天在做什麼？(11)
What did you say you were doing today? (10)
7. 我不覺得他開車開得很好。(11)
I doubt that he knows how to drive that well. (10)
8. 晚飯以後，我好好地睡了一覺。(12)
After dinner I had a long, peaceful nap. (11)
9. 我喜歡看有快樂結局的電影。(12)
I enjoy movies which have a happy ending. (12)
10. 這些房子好是好，就是太貴了。(12)
The houses are very nice but too expensive. (12)
11. 昨天死了小貓的小男孩很傷心。(13)
The little boy whose kitten died yesterday is sad. (13)

12. 那家飯館的中國菜應該很不錯。(13)
That restaurant is supposed to have very good food. (13)
13. 你真的很喜歡聽流行音樂，對不對？(14)
You really enjoy listening to country music, don't you? (14)
14. 她剛把公寓所有的房間都漆完了。(14)
She just finished painting the inside of her apartment. (14)
15. 在紅綠燈那過馬路，然後一直往前走。(15)
Cross the street at the light and then just continue straight ahead. (15)
16. 我希望別墅能便宜一些，我才買得起。(15)
I wish the price of town houses would become affordable. (15)
17. 我現在交往的那個人非常有幽默感。(15)
The person I'm dating has a wonderful sense of humor. (15)
18. 我想要一個我的寵物可以住的大房子。(16)
I want a nice, big house in which my animals can live. (14)
19. 我希望今年的天氣會比去年暖和一點。(16)
I hope it will get warmer sooner this year than it did last year. (16)
20. 我的一個好朋友老幫他的鄰居看孩子。(16)
A good friend of mine always takes care of my neighbor's three children. (16)
21. 他得先把房間打掃乾淨才可以出去玩。(16)
Before he can go outside, he has to finish cleaning his room. (16)
22. 我最快樂的回憶就是那次跟你去看戲。(16)
The most fun I've ever had was when we went to the opera. (16)
23. 那個被警察抓到的小偷長得又高又瘦。(16)
The terrible thief whom the police caught was very tall and thin. (17)

24. 根據統計，每年吸烟的人數越來越多了。(16)
The number of people who smoke cigars is increasing every year. (17/18)
25. 這次考試根本沒有你跟我說的那麼難。(16)
The exam wasn't nearly as difficult as you told me it would be. (18)
26. 她點菜的時候只點有肉的，從來不點青菜。(17)
She only orders meat dishes and never eats vegetables. (15/16)
27. 你昨天餵的那隻黑貓就是被狗追的那隻。(17)
The black cat that you fed yesterday was the one chased by the dog. (16)
28. 可以麻煩您把桌子上的那本書遞給我嗎？(17)
Would you be so kind as to hand me the book which is on the table? (17)
29. 我不知道十點半的火車是不是已經開走了。(18)
I don't know if the 11:30 train has left the station yet. (18)
30. 爲什麼還是有很多人早上什麼東西都不吃呢？(19)
There are a lot of people who don't eat anything at all in the morning. (19)

APPENDIX B: BACKGROUND INFORMATION QUESTIONNAIRE

Participant Number _____

Note. Some of the questions in this background information questionnaire were extracted and revised from a language background questionnaire designed by Kondo-Brown for departmental use. Revision and use of the questionnaire for the present study was with permission of the original author.

Gender: Male Female

Age: _____

Q1. What was your first or strongest language before your age of 5?

English Mandarin Chinese Chinese dialect (specify) _____ Other (specify) _____

Q2. What is your strongest language now?

English Mandarin Chinese Chinese dialect (specify) _____ Other (specify) _____

Q3. Check if your parents, grandparents, or anyone else in your immediate/extended family is a native speaker of Mandarin Chinese or a Chinese dialect.

Mother Father Maternal grandparent(s) Paternal grandparent(s) Other (specify) _____

Q4. At what age did you start to hear or use Mandarin Chinese? _____

Q5. Mandarin learning inside classroom

1. How long (in years) in total have you studied Mandarin at school? _____

2. List the following information for any previous Mandarin studies (e.g., college, high school, intermediate/elementary school, Chinese language school, private language institute, private tutor, etc).

Please also include the current study program.

School 1: _____ (school name) in _____ (country name)
Start year: _____ End year: _____ Hours of Mandarin class per week _____

School 2: _____ (school name) in _____ (country name)
Start year: _____ End year: _____ Hours of Mandarin class per week _____

School 3: _____ (school name) in _____ (country name)
Start year: _____ End year: _____ Hours of Mandarin class per week _____

Q6. Have you visited/lived in a Chinese-speaking country? No Yes (if YES, see below)

(At what age: _____; For _____ [length of the stay]; Location: _____)
(At what age: _____; For _____ [length of the stay]; Location: _____)

Q7. How much do you hear or use Chinese outside classroom?

1: never 2: occasionally 3: sometimes 4: frequently 5: almost always

- parents/grandparents speaking Chinese to you	N/A	1	2	3	4	5
- relatives/friends speaking Chinese to you	N/A	1	2	3	4	5
- self study Chinese	N/A	1	2	3	4	5
- others (specify): _____	N/A	1	2	3	4	5

APPENDIX C: PICTURE-CUED WRITTEN TASK

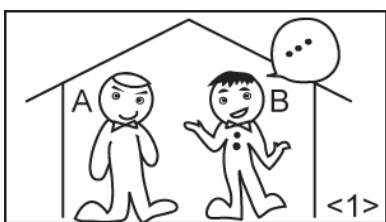
Note. Pictures shown in this task were created by the artist © Shu-Ping Wu.

Part I

Instructions: You will see 8 sets of sequential pictures describing different kinds of **physical movement**. Each set of pictures comes with a brief explanation. When you are responding to the questions, **pretend you were A** in each situation. Your job is to describe B's movement **from A's perspective** and complete the sentences in **Chinese characters or Pinyin**. You will start with **B** as the subject and **use the designated verb**.

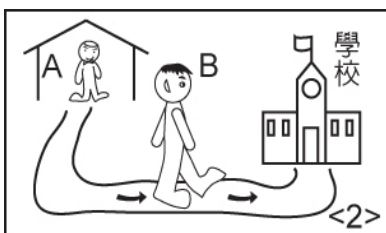
If there are **location** or **object nouns** specified in the pictures (shown in Chinese), remember to include the nouns in your sentences.

Sample



Picture <1>

A and B were talking to each other at home.



Picture <2>

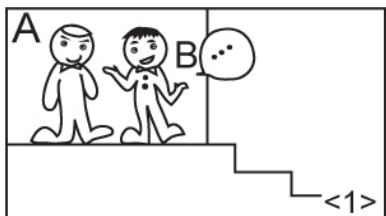
Later, A saw B...

Q: If you were A, what could you say to best describe B's movement?

B 到學校去了 (use 到)。

Cue: 學校(school)

1.



Picture <1>

A and B were talking to each other at the hallway.



Picture <2>

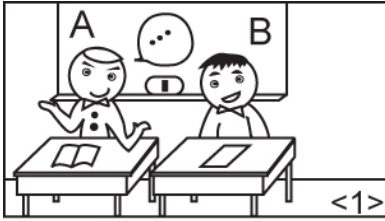
Later, A saw B...

Q: If you were A, what could you say to best describe B's movement?

B _____ (use 走)。

Cue: 樓梯(stairs)

2.



Picture <1>

A and B were talking to each other in the classroom.

Picture <2>

Later, A saw B...

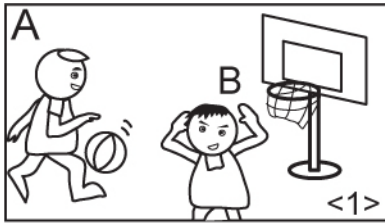
Q: If you were A, what would you say to describe B's movement?

B _____ (use 走)。



Cue: 教室(classroom)

3.



Picture <1>

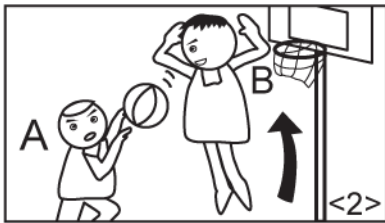
A and B were playing basketball.

Picture <2>

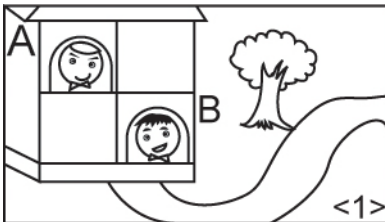
Later, A saw B...

Q: If you were A, what would you say to describe B's movement?

B _____ (use 跳)。



4.



Picture <1>

A and B lived in the same dormitory.

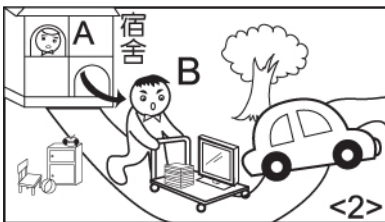
But B does not like living in the dorm. This afternoon A saw B was packing.

Picture <2>

Then, A saw B...

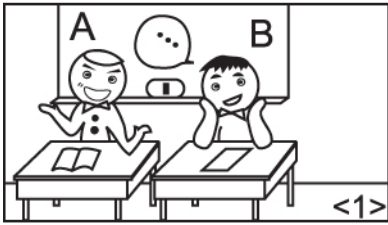
Q: If you were A, what would you say to describe B's movement?

B _____ (use 搬)。



Cue: 宿舍(dormitory)

5.



Picture <1>

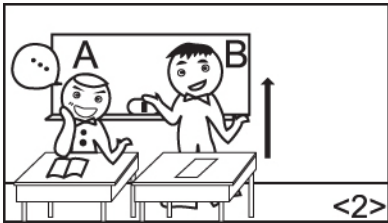
A and B were sitting together in the classroom.
Later the teacher called B's name.

Picture <2>

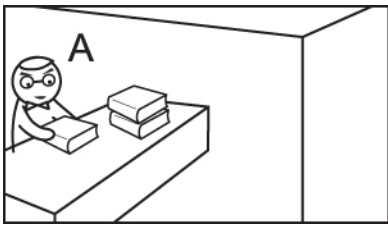
Then, A saw B...

Q: If you were A, what would you say to describe B's movement?

B _____ (use 站)。



6.



Picture <1>

A was studying in the library.

Picture <2>

Later, A saw B...

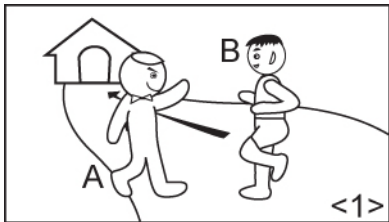
Q: If you were A, what would you say to describe B's movement?

B _____ (use 跑)。



Cue: 圖書館(library)

7.



Picture <1>

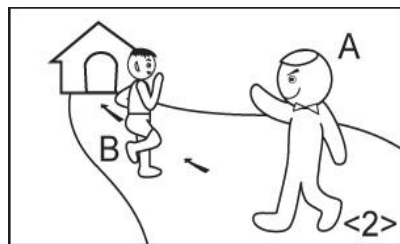
A noticed his neighbor B passing by. B was finishing jogging and his house was nearby.

Picture <2>

Later, A saw B...

Q: If you were A, what would you say to describe B's movement?

B _____ (use 跑)。



8.



Picture <1>

A was waiting at home for B to bring a letter.

Picture <2>

Later, A saw B...

Q: If you were A, what would you say to describe B's movement?



Cue: 信(letter)

B _____ (use 送)。

Part II

Instructions: You will see 8 sets of sequential pictures describing different kinds of **requests**. Each set of pictures comes with a brief explanation. When you are responding to the questions, **pretend you were A** in each situation. Your job is to describe B's movement **from A's perspective** and complete the sentences in Chinese. You will start with 請 (please...) and **use the designated verb**.

If there are location or object nouns specified in the pictures (shown in Chinese), remember to include the nouns in your sentences.

Sample



Picture <1>

A noticed that the trash can in the office was full. A hoped B could help with this.



Picture <2>

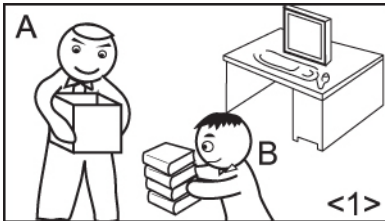
So, A called B and asked B to...

Q: If you were A, what could you say to ask for B's help?

請 把垃圾拿出去 (use 拿)。

Cue: 垃圾(trash)

1.



Picture <1>

A and B were packing some old books in the office.



Picture <2>

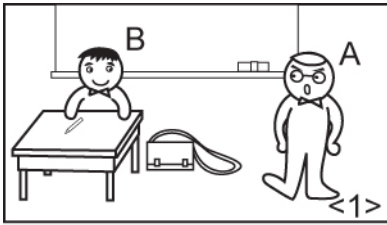
Then, A told B ...

Q: If you were A, what would you say to ask for B's help?

請 _____ (use 放)。

Cue: 書(book)

2.



Picture <1>

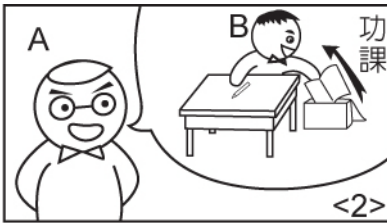
A was a teacher and B was A's student. A was about to review the homework in class.

Picture <2>

So, A told B...

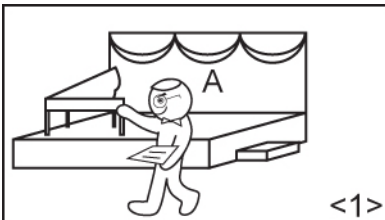
Q: If you were A, what would you say to ask for B's help?

請_____ (use 拿)。



Cue: 功課(homework)

3.



Picture <1>

A was setting up the stage for a music concert. A noticed the piano chair was missing.

Picture <2>

So, A told B...

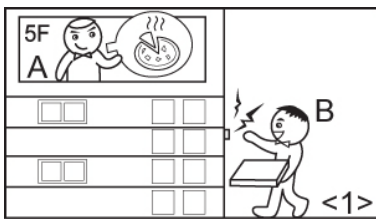
Q: If you were A, what would you say to ask for B's help?

請_____ (use 搬)。



Cue: 椅子(chair)

4.



Picture <1>

A lived in an apartment and had just ordered a pizza. When B was at the building door, A was too lazy to get the pizza..

Picture <2>

So, A told B...

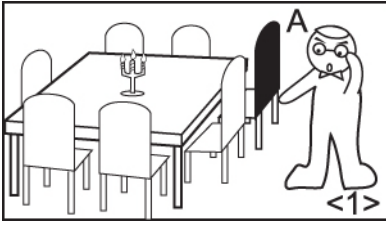
Q: If you were A, what would you say to ask for B's help?

請_____ (use 送)。



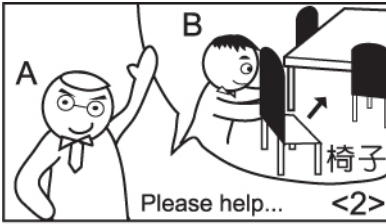
Cue: 披薩(pizza)

5.



Picture <1>

A chair was moved to another room because there were not enough seats for a meeting. When the meeting was finished, A felt the chair should be returned to its original place.



Picture <2>

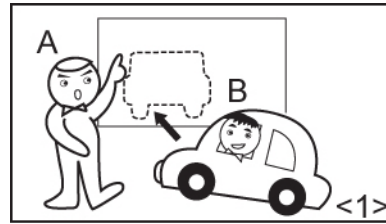
So, A asked B...

Q: If you were A, what would you say to ask for B's help?

請_____ (use 搬)。

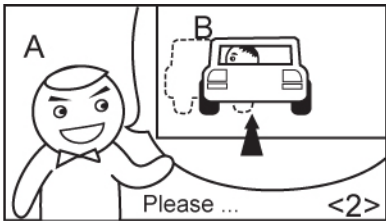
Cue: 椅子(chair)

6.



Picture <1>

A was standing by the garage and directing B to park his car. B's car should be parked in the garage.



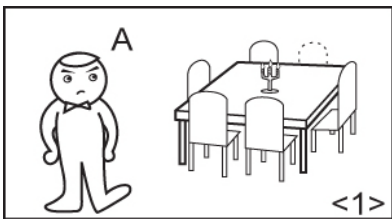
Picture <2>

So, A told B...

Q: If you were A, what would you say to ask for B's help?

請_____ (use 開)。

7.



Picture <1>

A was arranging furniture for a party. A noticed they needed one more chair.



Picture <2>

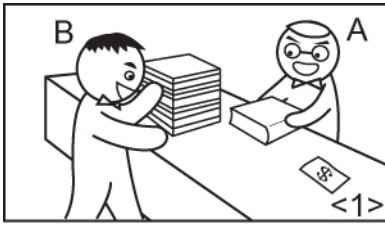
So, A told B...

Q: If you were A, what would you say to ask for B's help?

請_____ (use 搬)。

Cue: 椅子(chair)

8.



Picture <1>

A was a teacher and A just ordered ten books from B. The books were too heavy to carry. A hoped B could deliver the books to the classroom.

Picture <2>

So, A asked B...

Q: If you were A, what would you say to ask for B's help?



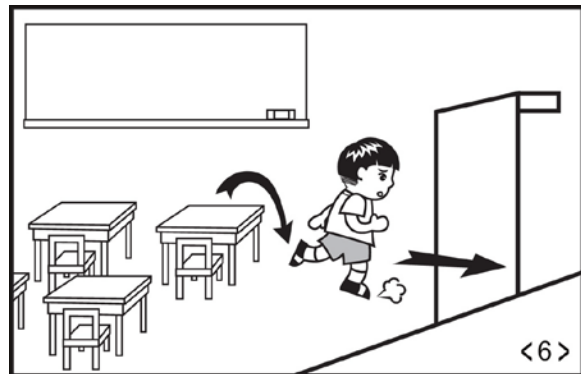
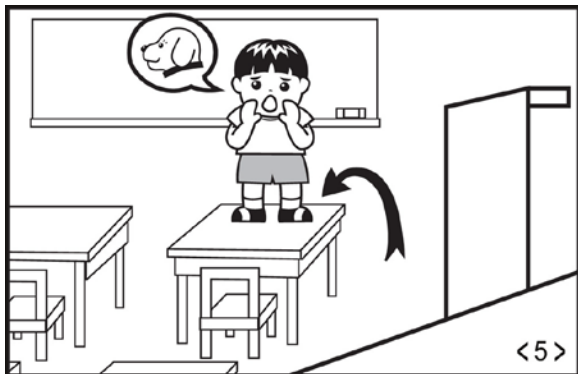
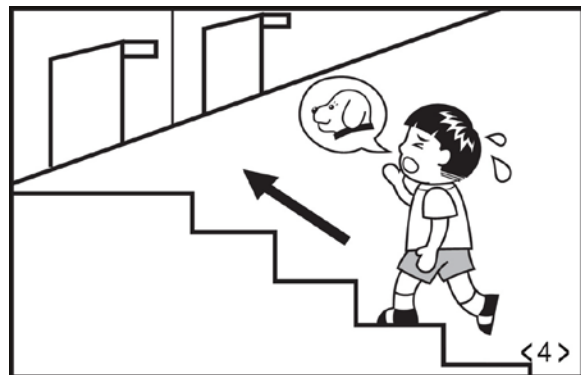
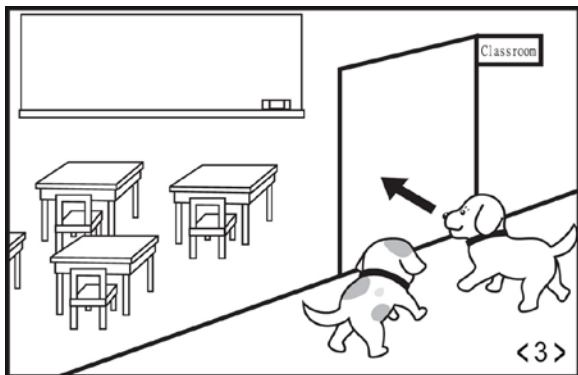
Cue: 教室(classroom)

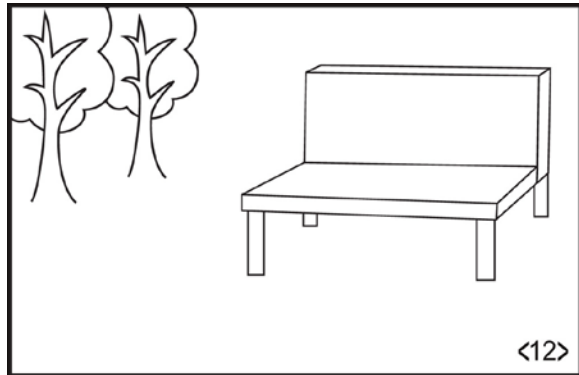
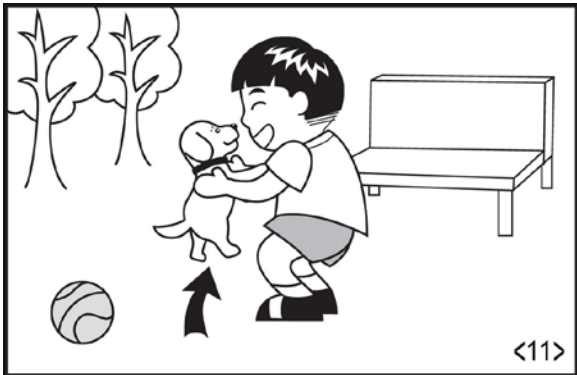
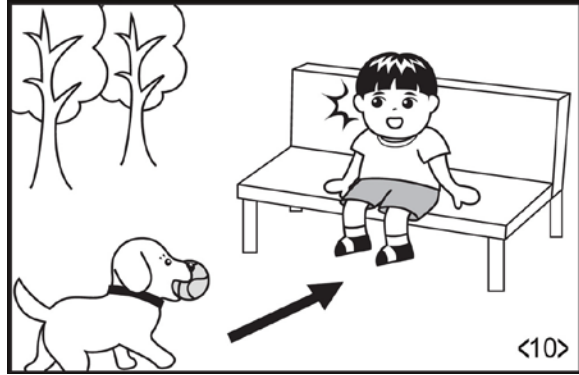
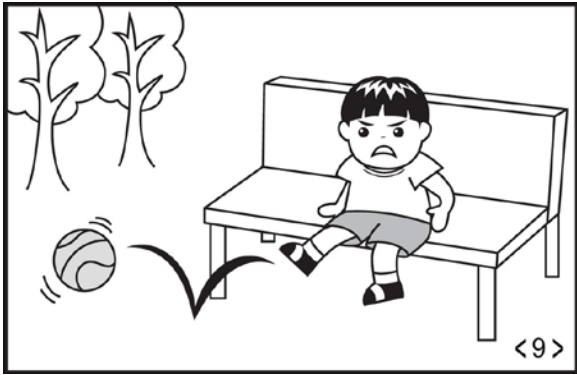
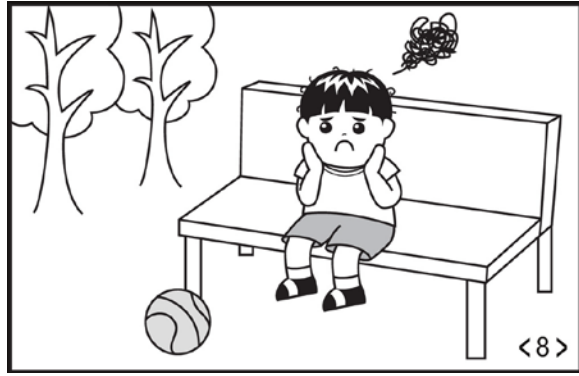
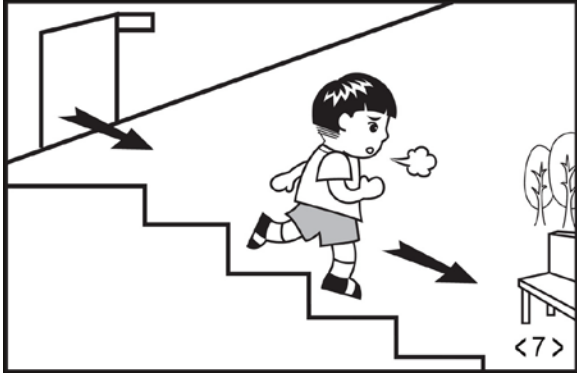
請_____ (use 送)。

APPENDIX D: ORAL NARRATIVE TASK

Note. Pictures shown in this task were created by the artist © Pei-Hua Wu.

Instructions: You will see 12 sequential pictures in this task. Your job is to tell a story in Chinese to describe what you see in as much detail as you can.





APPENDIX E: TRANSCRIPTION AND CODING CONVENTIONS

Note. Most of the transcription and coding conventions listed in this Appendix were adapted from Berman and Slobin (1994, pp.657-664). The examples provided to illustrate each convention, however, are from the data collected in this study. For other aspects of coding decisions that were not covered in Berman and Slobin (1994), the relevant references are cited individually.

1. Transcription conventions

(1) Task comments that are not part of the storyline were excluded.

E.g. 1.1 And that's all.

1.2 我說完了。 'I finished talking.'

1.3 “Ball,”怎麼說？ 'How to say “ball”?' (example extracted from L2 texts)

(2) Clauses or parts of clauses that contain a substantial portion of unintelligible speech were excluded.

(3) Reformulations and false starts were both included.

(4) For L2 learners' texts, when a non-predicate word or phrase was inaccurately uttered (e.g., incorrect tones or use of the learner's L1), but the intended meaning was clear and could be fully recovered, such portion was retained and the repaired portion was included (coding convention proposed by the author).

(5) For L2 learners' texts, when a clause contained more than one word or phrase that was unintelligible or showed use of the learner's L1, such clauses were excluded (coding convention proposed by the author).

2. Coding conventions

a. Definition of clause

- A clause was defined as a unit containing a unified predicate (viz. finite and non-finite verbs, predicate adjectives) that expresses a single situation (activity, event, or state).

- One-clause examples:

(1) Infinitives and participles that function as complements were included with the matrix verb.

E.g. 1.1 He wanted to get to know her.

1.2 His dog starts going after another one.

1.3 這小孩就開始去找狗。 'The kid started to look for the dog.'

(2) Narrator's comments were included with the matrix verb.

E.g. 2.1 I mean the dog and the boy go home.

- Two clauses examples:

(1) Subordinate complements and their main clauses, having the same subject or different subjects, were treated as two separate clauses.

E.g. 1.1 He was so angry / that he kicked the ball. (The slash sign divides the clauses.)

1.2 He thinks / she is cute.

1.3 The boy does not want / the dog to go away.

1.4 The little boy kicks the basketball / that's on the ground.

1.5 小白看到 / 路上有一隻小花狗。 'Little Bai saw / there was a spotted dog on the road.'

1.6 他很想看看 / 小狗妹妹是什麼樣子。 'He really wants to see what the girl dog looks like.'

1.7 小孩帶的 / 小狗一直跟著那隻小狗。 'The dog / the boy brought / has been following that other dog.'

(2) Grammatical reductions such as ellipsis and gapping, in which the verb semantics were fully recoverable from the text, were treated as separate clause.

E.g. 2.1 *Jim spotted a ball next to him.*

- Other language-specific cases (coding convention proposed by the author):

(1) English: Cases of dangling participles were treated as a separate clause.

E.g. 1.1 He searched over and over / calling out for his dog Chester.

(2) Chinese: Serial-verb constructions in which each verb denoted a unified predicate were treated as separate clauses.

E.g. 2.1 小明帶著他的小狗小白 / 出去 / 散步。 'lit. Xiao Ming took his dog Little White / went out / took a walk.'

b. Definition of motion clause

- Motion clauses are clauses that show movement of an entity changing its location from one point in space to another (based on Talmy's (2000) definition of a motion event).

- Non-motion clause examples (proposed by the author):

(1) Question clauses, negative clauses, and clauses that show the character's speculation do not reflect actual spatial movement and were therefore not treated as motion clauses.

E.g. 1.1 Where did you go?

1.2 The dog didn't come.

1.3 He is wondering / why the dog has to go away.

1.4 他在想 / 小狗去哪了。 'He is wondering / where the dog has gone to.'

(2) Cases of fictive motion (Talmy, 2000) do not reflect an entity's actual movement and were therefore not treated as motion clauses.

E.g. 2.1 那個足跡到那個教室。 'The footprints went into that classroom.'

c. Classification of types of motion verbs

- Motion verbs used in the motion clauses were classified into three types of verbs, including manner verbs, path verbs, and neutral verbs, following Özçaliskan and Slobin (2003) and Chen and Guo (2009).
- Following Chen and Guo (2009), phrasal verbs were excluded from the analysis of use of motion verbs, because phrasal verbs have distinct syntactic and semantic properties. Some phrasal verbs conflate both the manner and path and thus cannot be classified into the three types. The phrasal verbs also tend to appear alone and cannot be freely combined with the DCs.
E.g. Chinese: 亂竄 ‘scurry,’ 跑掉 ‘slink; run away’
English: take a seat, take off, take a walk

d. Classification of Chinese motion constructions (proposed by the author)

- Motion constructions in the Chinese texts were classified into four categories, according to their syntactic structures. The four categories included: Manner/Neutral verb + DC1 + (DC2 *lái/qù*), Manner verb only, Path verb only, and Path verb + DC *lái/qù*.
- Motion constructions associated with the use of preposition *zài* were excluded from the analysis of use of motion constructions, because the preposition *zài* belongs to a syntactic category that is distinct from that of focused satellites (i.e., DCs) in this study (see examples 8 in section 3.3.3 concerning usage of the preposition *zài*).

APPENDIX F: LIST OF MOTION VERBS

1. Motion Verbs produced by English NSs (40 types)

a. Manner Verb (20 types)

bring, catch, chase, climb, drop, fall, follow, hit, hop, jump, kick, pick, race, roam, roll, run, rush, stroll, walk, wander

b. Path verb (14 types)

approach, come, cross, enter, exit, fetch, go, head, land, leave, pass, reach, retrieve, return

c. Neutral Verb (6 types)

carry, get, move, sit, stand, take

Note. Although the verb *move* expresses notion of translational motion, it does not denote manner or path information. Following classification made by Özçaliskan and Slobin (2003), *move* was categorized as a neutral verb.

2. Motion Verbs produced by English NSs (33 types)

a. Manner Verb (15 types)

追 *zhuī* ‘chase; catch,’ 跟 *gēn* ‘follow,’ 跑 *pǎo* ‘run,’ 走 *zǒu* ‘walk,’ 衝 *chōng* ‘dash,’ 闖 *chuǎng* ‘brave in,’ 爬 *pá* ‘climb,’ 踢 *tī* ‘kick,’ 跳 *tiào* ‘jump,’ 滾 *gǔn* ‘roll,’ 飛 *fēi* ‘fly,’ 推 *tuī* ‘push,’ 落 *là* ‘fall,’ 穿 *chuān* ‘pass through,’ 撿 *jiǎn* ‘pick’

b. Path verb (9 types)

來 *lái* ‘come,’ 去 *qù* ‘go,’ 上 *shàng* ‘ascend,’ 下 *xià* ‘decend,’ 進 *jìn* ‘enter,’ 出 *chū* ‘exit,’ 回 *huí* ‘return,’ 過 *guò* ‘pass/cross’ 到 *dào* ‘arrive’

c. Neutral Verb (9 types)

抱 *bào* ‘hold in arms,’ 叼 *diāo* ‘hold by teeth,’ 送 *sòng* ‘deliver; send’ 帶 *dài* ‘take; bring; carry,’ 咬 *yǎo* ‘bite,’ 站 *zhàn* ‘stand,’ 坐 *zuò* ‘sit,’ 找 *zhǎo* ‘look for,’ 啣 *xián* ‘hold in the mouth’

APPENDIX G: LIST OF CRITICAL SENTENCES

1. 車子很快地衝過來。
車子很快地衝過去。
2. 足球飛過來了。
足球飛過去了。
3. 大黃狗跑過來了。
大黃狗跑過去了。
4. 火車開過來了。
火車開過去了。
5. 老虎衝過來了。
老虎衝過去了。
6. 籃球被丟過來了。
籃球被丟過去了。
7. 他把球踢回來了。
他把球踢回去了。
8. 車子過來了。
車子過去了。
9. 警察很快地追過來。
警察很快地追過去。
10. 球被打回來了。
球被打回去了。
11. 她把車開過來了。
她把車開過去了。
12. 運動員抱著球跑過來。
運動員抱著球跑過去。
13. 她用力把球踢過來。
她用力把球踢過去。
14. 他生氣地衝進來。
他生氣地衝進去。
15. 飛機飛過來了。
飛機飛過去了。
16. 老鷹快速地飛過來。
老鷹快速地飛過去。