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Learning to Express Motion Events in an L2: The Case of Chinese Directional Complements

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Abstract The present study adopted a cognitive linguistic framework—Talmy's (1985, 1991, 2000) typological classification of motion events—to investigate how L2 Chinese learners come to express motion events in a target-like manner. Fifty-five US university students and 20 native speakers of Chinese participated in the study. A controlled composition task and a picture-cued written task were administered to elicit learners' knowledge and degree of mastery of Chinese spatial morphemes, also known as directional complements (DCs). Analysis of learners' interlanguage data shows that the difficulties 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 path satellites and as independent verbs posed considerable difficulty for the learners whose L1, English, encodes path by means of satellites only. Based on the results, a developmental order of mastery of L2 Chinese DCs is proposed. The study illuminates areas of difficulty in adjusting to the L2 thinking-for-speaking patterns (Cadierno, 2004, 2008; Slobin, 1996a) that arise when differences in spatial categorization and in conventionalized ways of path encoding exist between the L1 and L2.

Keywords motion event; spatial categorization; Chinese directional complements; thinking-for-speaking hypothesis; satellite-framed languages; equipollently-framed languages; serial-verb languages

The study of the relationship between space and language has been of considerable interest to linguists and psychologists for years (e.g., Bloom et al., 1996; Bowerman, 1996; Choi & Bowerman, 1991; Hickmann & Robert, 2006; Lakoff, 1987; Talmy, 1985, 2000; Slobin, 1998, 2004; Wu, Morganti, & Chatterjee, 2008). These studies have shown that speakers of different languages appear to conceptualize space and motion events in a language-specific manner (Bowerman, 1996; Choi & Bowerman, 1991; Slobin, 1998, 2004; Talmy, 1985, 2000). According to Talmy (1985, 1991, 2000), languages can be divided into a binary classification of satellite-framed languages and verb-framed languages, depending on how the path is encoded for events involving movement. Talmy's typological framework is well known by now and has received empirical support in L1 acquisition. For example, research has shown that the ways children and adults express motion events are strongly affected by the typological properties of their first language (e.g., Berman & Slobin, 1994; Hickman, 2006). At the same time, Talmy's proposal has been modified to include a third typological category: equipollently-framed languages (Slobin, 2004, 2006). Recently, the question of how L2 learners with typologically different L1s and L2s come to express motion events has begun to receive research attention in L2 acquisition, and researchers have mostly concentrated on comparing L1 and L2 production that taps the binary traditional typology (e.g., Cadierno, 2004, 2008; Navarro & Nicoladis, 2005).

The present study expands this line of research by investigating how L1 English learners of Chinese learn to describe motion events in their L2. 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, and thus has been proposed to fall in the third

type— equipollently-framed languages (Slobin, 2004, 2006; see also Chen, 2007; Chen & Guo, 2009). Although Chinese uses post-verbal directional complements (hereafter DCs)[1] to encode a path, a strategy somewhat similar to English verb particles (e.g., *up, down, out*), Chinese DCs differ from English verb particles in at least three aspects: the variety of DC types that exist in Chinese, the various word order patterns associated with their use, and their typological conceptual-semantic features (Chao, 1968; Cheung et al., 1994; Henne et al., 1977; Liu et al., 1983). Given these subtle L1-L2 differences and similarities, the present study addressed several key questions: Facing the differences and similarities between the ways that Chinese and English speakers adopt to describe motion events, how do English learners of Chinese manage to gradually speak in a target-like manner? Do heritage language learners and foreign language learners exhibit different learning profiles? What are the potential sources of difficulties in learning?

Theoretical Motivation

Given the likelihood that many readers are unfamiliar with the facts of Chinese expression of motion events, this section is organized as follows. First, I present Talmy's typological framework and offer an overview of extant research on the acquisition of motion events in L1 and L2. After situating the present study in the field of L2 research, I then introduce the syntactic features of Chinese DCs and discuss the potential sources of difficulties that are associated with learning another way of thinking-for-speaking (Slobin, 1996a) in L2.

Expressing Motion Events: A Cognitive Linguistic Framework

Speakers of different languages appear to conceptualize motion events differently. As proposed by the cognitive linguist Leonard Talmy (1985, 1991, 2000), languages can be divided into either satellite-framed languages (S-languages) or verb-framed languages (V-languages). Languages such as English and Chinese are S-languages, which characteristically conflate motion and manner/cause in the main verb, and separate path by means of a satellite. English verb particles, Chinese directional complements, and German separable and inseparable verb prefixes each relate to the main verb as "a dependent to a head," according to Talmy (2000, p. 102), and are typical examples of path satellites.[2] By contrast, other languages, such as Spanish and other Romance languages as well as Japanese and Korean, are referred to as V-languages, which typically encode path in the main verb, and leave manner/cause outside of the main verb as an adverbial or a gerundive type of constituent. For example:

(1) Satellite-Framed Language (S-language)

a. English

An owl *flew* ***out***.
Figure Motion+Manner **Path**

b. Chinese

Maotouying *fei* ***chu-lai*** *le*
owl fly **out-hither** Perf.
Figure Motion+Manner **Path**

(2) Verb-Framed Language (V-language)

a. Spanish

Salió	*un*	*buho.*
Exited[3]	an	owl
Motion+**Path**	Figure	

As examples (1) and (2) illustrate, the S-languages, in this case English and Chinese, use a path satellite, *out* and *chu-lai* respectively, to encode path of the motion. By contrast, Spanish as a V-language conflates path and motion together in the main verb *sale* 'exit.' Thus, S-languages and V-languages convey path information in a different manner.

Talmy's seminal work has inspired L1 and L2 researchers to study the possible influences of this typological difference on L1 and L2 acquisition. Berman and Slobin (1994) conducted a cross-linguistic and developmental study to analyze oral narrative data 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. The results of the study[4] showed that speakers of S-languages used a greater variety of motion verbs and provided more manner information 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 speakers of V-languages. Specifically, speakers of S-languages tended to specify the details of the moving objects along the paths and to leave the static settings to be inferred, whereas speakers of V-languages tended to describe the static scene in which the movement took place, and to leave the paths of the moving

object to be inferred. These distinctive typological preferences used by speakers to express motion events could be observed as early as the age of 3.

Based on the typological analysis of the narrative data, Slobin (1996a) has proposed a "thinking-for-speaking hypothesis"—a particular kind of language-cognition interface phenomenon. This hypothesis suggests that cognition plays a dynamic role when a speaker is in the evanescent time frame of constructing utterances and fitting thoughts into available linguistic forms. When people construct a verbalized expression of their perception, the languages they speak train them to pay attention to different details of events and situations. 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 the individual speaks. The thinking-for-speaking hypothesis explains why speakers of S-languages were observed to have different thought patterns for speech from those of V-languages. In acquiring a native language, one learns to attend to dimensions of experience in a language-specific way. Observing the cross-linguistic differences in how motion events were described by speakers of different types, Slobin (1996a) has suggested that the thinking-for-speaking patterns developed in L1 acquisition might be resistant to restructuring in L2 acquisition, especially for adult L2 learners. Robinson and Ellis (2008) underscore the theoretical importance of Slobin's proposal and characterize the process of development of L2 competence as one of "rethinking-for-speaking."

Drawing from Berman and Slobin's (1994) seminal work, Cadierno (2004) conducted a study to examine the potential difficulties in adult L2 learners learning to change their ways of describing motion events, when the target L2 is typologically

different from the L1. She investigated how L1 Danish (S-language) learners come to express motion events in L2 Spanish (V-language). Sixteen Danish learners and 16 native speakers of Spanish participated in this study, and the same frog story was used to elicit data. The results of Cadierno's study showed that, compared to the data from the Spanish native speakers, the intermediate L2 Spanish learners exhibited a higher degree of complexity and elaboration of the paths of motion in their interlanguage data (e.g., redundant and anomalous path particles and unnecessary ground adjuncts). She characterizes this pattern of L1 to L2 transfer in L2 production as "satellization" of L2 Spanish motion constructions (see also Navarro & Nicoladis, 2005, for similar results). Other studies that included higher-level proficiency participants have shown that the influence of the learners' L1 thinking-for-speaking patterns on their L2 diminishes over time in that advanced-level learners seem to more ready to adjust to the L2 thinking-for-speaking patterns in their descriptions of motion events (Cadierno & Ruiz, 2006; Navarro & Nicoladis, 2005)

A Revised Typology to Accommodate the Serial-Verb Languages

Building on Talmy's binary typological classification, many interesting phenomena related to the language-cognition interface have been observed. However, researchers have noticed that Talmy's binary division cannot satisfactorily sort all languages. Specifically, Slobin (2004, 2006) proposed that in serial-verb languages, such as Thai[5] and Mandarin Chinese, which allow two or more juxtaposed verbs in a single clause[6], both manner and path of the motion receive equal weight in the serial verbs, and thus do not fit well into the

binary typology. He then posited a third category called "equipollently-framed languages" to accommodate the serial-verb languages. Following Slobin's work, Chen (2007) investigated Chinese children's L1 acquisition and adults' motion event descriptions in elicited narrations of the frog story. Chen and Guo (2009) examined the use of motion events in nine Chinese novels. The results of both studies showed that the structural and discourse characteristics of Chinese did not completely pattern with those of either S-languages or V-languages, but instead showed hybrid patterns that are characteristic of both types. Accordingly, Chen and Guo suggested that Chinese should be classified as an equipollently-framed language, as suggested by Slobin. This proposal for a third type reveals the difficulty in classifying serial-verb languages like Chinese, into a strict binary typology (Cadierno, 2008).[7]

In contrast to Talmy's analysis, Slobin (2006, p. 63) analyzed motion constructions, such as *fei-chu-lai* 'fly-out-hither,' as serial-verb constructions, in which *chu-lai* 'out-hither' are treated as full verbs that receive equal weight with the preceding verb *fei* 'fly.' However, note that such motion constructions are generally referred to as "Verb-DC structures" by Chinese linguists (e.g., Chao, 1968; Cheung et al., 1994; Liu et al., 1983; Lu, 2002). The small set of post-verbal DCs that now encode the path/direction in which a person or an object moves were originally motion verbs in Classical Chinese (Peyraube 2006). Having undergone a process of grammaticalization, these motion verbs lost their original meanings and gradually developed the syntactically restricted functionality of encoding path information as DCs (Li, 1993; Peyraube, 2006; Talmy, 2000). Although DCs typically occur right after the main verb, which can look like a serial-verb construction, a DC denotes merely the direction of the movement named by the main verb. That is, a

Verb-DC structure refers to a single movement instead of to a series of motions.

As Peyraube (2006) has suggested, it is reasonable to analyze Chinese DCs as a kind of satellite, like English verb particles, because they have already become function words rather than full verbs. However, complicating this picture is the fact that DCs can also occur as individual full verbs in contemporary Chinese (Chu, 2004; Gao, 2001; Talmy, 1991, 2000; Peyraube, 2006). The following examples of *hui* (回 'return') show the dual functions:

(3) a. *hui* as a full verb

Ta ***hui*** *Beijing* *le.*
he **return** Beijing Perf.

b. *hui* as a DC

Ta *pao* ***hui*** *xuexiao* *le* .
he run **back** school Perf.

In (3a), *hui* 'return' functions as a single main verb for the entire sentence, and encodes both motion and path information. By contrast, *hui* in (3b) is not a full verb but a DC, because it only indicates the direction of the movement *pao* 'run' as returning to the original place. In other words, instances like (3a) make Chinese a V-language, while instances like (3b) make Chinese an S-language.[8] The phenomenon that Chinese DCs not only encode path information but also function as full verbs is a natural result of diachronic language change, which consequently causes the controversy over the classification of the Chinese language. More importantly, with respect to second language acquisition, the dual

functions of DCs, as both complements and full verbs, may work to mask the syntactic regularity of DC patterns in a learner's developing grammar.

The motion verbs that also function as DCs in the Mandarin language are summarized in Table 1.

[Put Table 1 here]

Before discussing how learners need to attend, such that they can develop L2 thinking-for-speaking patterns for a serial-verb language like Chinese, I will first introduce the syntactic features of DC constructions in the next section.

Syntactic Complexity of Chinese DCs

The syntactic complexity of DCs is reflected in two dimensions of variation: that of number of constituents and associated word order and that of DC type. The two dimensions yield a six-type classification of DC patterns that can be used to describe a motion event. The linguistic facts are summarized in Table 2, following Chao (1968), Cheung et al. (1994), Liu et al. (1983), Lu (2002), Peyraube (2006), and Yao and Liu (1997).

[Put Table 2 here]

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 encoded, 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 2, 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., *zou hui* ***sushe*** *lai* 'lit. walk-back-**dormitory**-hither' or *chu* ***guo*** *qu* 'lit. exit-**country**-thither'). By contrast, the associated word order for an Object NP is more flexible than that for a Place NP (cf. Liu et al., 1983; Yao & Liu, 1997; Yip & Don, 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 2, or between the Verb and DC1 (i.e., *ban* ***yi-zhang-da-zhuozi*** *chu lai* 'lit. move-**a-large-table-**out-hither'). It can also occur after DC1 and DC2 (i.e., *ban chu lai* ***yi-zhang-da-zhuozi*** 'lit. move-out-hither-**a-large-table**'). The issue of grammatical word order becomes relevant for Types (3) through (6), since it depends on the type of 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 path denoting the figure's deictic path or movement from the perspective of the speaker: *lai* 'moving toward the speaker' or *qu* 'moving away from the speaker.' The second restriction is 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 the deictic path through the second DC for the utterance to be grammatical. For instance, to say "*he walked in*" in Chinese, one has to use the Type (2) complex DC pattern: V (*zou* 走 'walk') + DC1 (*jin* 進 'into') + DC2 (*lai* 來 'hither'). Omitting the deictic DC2 *lai* would generate a non-target-like form (i.e., **Ta zou jin le*. 'lit. He-walk-into-Perf.'). Hence, Type (2) complex DC constructions are a source of evidence for grammatical encoding of the second hither/thither DC. More generally, the encoding of deictic path is common in the expression of motion events by Chinese speakers. According to Chen (2007, p. 53), 55% of the motion event descriptions found in 59 Chinese frog stories encoded deictic paths. Observing the frequent use of deictic paths in Chinese frog stories, Slobin (2004) has suggested that deixis seems to be more closely tied to conceptions of path for Chinese speakers. In English, by contrast, the hither/thither perspective is either omitted or implied in the lexical verb forms, such as *bring*/*take*, *come*/*go*, or *return*/*leave*. Therefore, complex DCs, which encode two dimensions of a single motion event (e.g., *chu-lai* 出來 'out-hither,' *shang-qu* 上去 'up-thither') in separate lexical items, might be more challenging for L2 learners than are simple DCs.

Chinese language teachers are fully aware of the challenges that DC constructions present to L2 learners, and studies analyzing L1 and L2 use of DC constructions have been

conducted. Lu (1984) analyzed a corpus of written materials, containing 265,000 Chinese characters, to study distribution of DCs in the writing of native speakers. He found that the Type (2) complex DCs often co-occur with the disposal *ba*-construction[9], which highlights the subject's disposal of or impact upon the object, and had the highest occurrence rate, 52.5%, among the different DC patterns. The second most widely used DC form was the Type (1) simple DC construction, "Verb + *lai*/*qu* (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. Lu's corpus-based study also showed that the encoding of hither/thither path in describing a motion event is widely applied by Chinese native speakers.

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 the more restricted word order accepted for a Place NP in the learners' developing grammars. He interpreted this pattern of results as evidence of learners' overgeneralization of the variety of word orders accepted for Object NPs to Place NPs.

L1-L2 Differences in the Conceptualization of Spatial Semantics

Thus far, I have argued that the syntactic complexity of DCs shows potential challenges that are likely to arise from mastering the surface forms. But learning to express motion events in L2 Chinese also involves an implicit process of conceptual learning that is associated with learning another way of thinking-for-speaking, or "rethinking-for-speaking" in L2, as Robinson and Ellis (2008) call it.

Since 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. In L1 acquisition, Choi and Bowerman (1991) observed that English and Korean children used and understood spatial words according to the language-specific categories. The 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 cross-linguistic 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: *shang* (上) and *qi* (起). The Chinese morpheme *shang* conceptually highlights the region where the moving figure will be located after moving, while *qi* highlights the original region where the moving figure came from (Chu, 2004; Liu et al., 1983; Liu, 1988; Yao & Liu, 1997; see also Dai, 2005). Consider the following examples:

(4) *Qing* *zhan* ***shang*** *lai.*
please stand **up** hither
'lit.*Please stand up to here.'

(5) *Ta* *zhan* ***qi*** *lai* *le*
he stand up hither Perf.
'He stood up.'

In example (4), using *shang* to encode the path will suggest the agent moving 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 *qi* to encode the path will profile only the source region of the movement. As in example (5), 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 *shang* and *qi*, 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 thinking-for-speaking in order to promptly describe motion events like those in examples (4) and (5). Likewise, the encoding of hither and thither information (*lai* and *qu*) that appears as the DC2 in all complex DCs would require English-speaking learners to adjust themselves to an unfamiliar thinking-for-speaking pattern, in which the deictic path needs to be frequently attended to. In short, the recategorization and reallocation of attentional resources needed for acquiring Chinese DCs, such as *shang*, *qi*, *lai*, and *qu* are additional potential sources of challenges in developing L2 ways of rethinking-for-speaking.

Differences between Heritage and Foreign Language Learning

L2 learners' interlanguage development in acquiring DCs may differ according to their degree of L2 exposure and frequency of L2 use inside and outside the classroom. Studies have shown that heritage language learners[10] (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). 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 been identified as well. For example, Au and Romo (1997) observed that first-year university Korean HLLs outperformed FLLs on their grammaticality judgments of the use of subject and object case markers. Furthermore, and in accordance with cognitive linguistic and usage-based accounts of L2 acquisition

(Robinson & Ellis, 2008), HLLs might potentially use or learn the DC constructions better and faster than FLLs due to their prior and prolonged exposure to the input. In other words, a heritage versus foreign language learning background could mask differential opportunities in using and being exposed to the language, and this difference in turn may be potentially important when assessing competence in using DCs. Given that in the curricular context where the present study took place, learners of heritage or foreign language background are instructed in the same mixed classes, it was considered important for the study to inspect performances separately by HL or FL learning background.

The Present Study

Research Questions

The extant literature is suggestive of areas where potential challenges can be expected when learning to express motion events in L2 Chinese. However, these challenges remain unexamined from a cognitive linguistic, empirical perspective. Hence, the purpose of this study is to better understand the suppliance strategies of DCs by learners of different proficiency levels from different learning backgrounds, so as to better detail the rethinking-for-speaking difficulties that learners typically encounter. The following research questions were investigated:

1. Based on an analysis of interlanguage performance on two elicitation tasks among learners of different proficiency levels, what does L2 Chinese learners' learning process of DCs look like? Specifically, (a) how does the learners' ability to use DCs relate to their overall L2 Chinese proficiency? and (b) do HLLs and FLLs exhibit different learning profiles?

2. Are the six types of DCs equally difficult for the learners? What could be the factors that make the DCs difficult to acquire?
3. Facing the L1-L2 differences and similarities in typology and in the semantics of spatial categorization, how well do the learners manage to express motion events in an idiomatic, target-like manner?

Method

Participants and Research Context

Fifty-five L2 Chinese learners and 20 native speakers of Chinese participated in this study. As shown in Table 3, the L2 learners were sampled from two proficiency groups and also classified as being from a heritage or foreign language background, following the procedures described in this section.

[Put Table 3 here]

The L2 learner participants were all enrolled in Chinese language courses at a large public university in the United States. Proficiency was determined by means of institutional status (Thomas, 2006). Specifically, the intermediate learner group (n=30) was composed of second-year students, and the advanced learner group (n=25) was sampled from either third- or fourth-year Chinese language classes. The Chinese language classes offered for each level in this institution meet four hours per week. Therefore, it is assumed that, by the time students participated in this study, they had the proficiency level equivalent to approximately 210 hours of instruction (for the intermediate learners) and

330 hours (for the advanced learners).[11] The target DC constructions are systematically introduced in the first-year level and continuously occur in different places, such as reading texts, sample sentences for vocabulary, or grammar points, throughout the lessons. The grammar points are taught in a cyclical manner. When the L2 learners participated in this study, they had at least systematically learned the target DC constructions twice in two different lessons.

The L2 participants were further subdivided into HLLs and FLLs within each level, based on a background information questionnaire administered, shown in Appendix A. As discussed in the literature, an individual's identity, linguistic competence, and ethnicity can all serve as criteria for determining whether one is an HLL (Kondo-Brown & Brown, 2008; Valdés, 1995, 2000, 2001; Wiley, 2001). In the present study, each learner's prior contact with Chinese as reported in the questionnaire was used to differentiate HLLs from FLLs. The criteria[12] for classification of HLLs were: (1) a learner has both parents with Mandarin Chinese or another Chinese dialect as their native or dominant language, and the learner also reports exposure to the language at home; and (2) a learner, whether or not ethnically Chinese, reports living in a Chinese-speaking country longer than two years and having been continuously exposed to the language. Based on the information collected, a total of 25 learners were included in the HLL groups, with 23 fitting the first criterion and 2 fitting the second. As shown in Table 3, 14 of the HLLs were in the intermediate classes and 11 in the advanced classes.

To gather baseline data, 20 native-speaker participants (NSs) were invited to participate in the same language experiment as the L2 learners did. The Chinese speakers, aged between 23 and 35 years, were all international students in the same public university

in the United States. They were originally from either China or Taiwan. By the time they participated in this study, they had spent between one to three years in the States. This suggests that the NS baseline group can be considered L1-dominant and that any possible L2-to-L1 influence (Cook, 2003) in their Chinese expression of motion can be expected to be minimal. The baseline data were used to test the effectiveness of the research design for eliciting the target structures and were also used to serve as a basis for comparison with the data produced by the L2 learners.

Procedures and Methods of Data Elicitation

Three instruments were developed and administered in this study, as shown in Table 4.

[Put Table 4 here]

A background information questionnaire that measured each learner's prior contact with Chinese was distributed to the learners (see Appendix A). Two tasks were used to elicit learners' knowledge and degree of mastery of the DC constructions. All materials were pilot-tested prior to the actual gathering of data. As in most previous studies (e.g., Berman & Slobin, 1994; Cadierno, 2004), the motion scenes presented in the two tasks included both self-initiated motion and caused motion.

First, a controlled composition was designed using the wordless picture book, *Frog, where are you?* (Mayer, 1969; see Appendix B). This composition was used to elicit data containing information about learners' preferences and strategies in describing a series of motion events. The focus of the first task centered on: (a) how well the learners encoded

the deictic paths in DCs of Type (2) and (b) whether or not the dual functions of DCs and the typological characteristics of Chinese as a serial-verb language influenced the learners' use of DCs. Participants read a Chinese passage that had seven blanks left open for them to complete the sentences. Each blank had a subject NP and a designated verb given as hints. The subject NPs showed some kind of spatial movement depicted in the picture story. The participants were required to use the hints to describe what happened to the subject NPs in the pictures. Sample responses (translated into English) produced by the learners are: "the dog fell from the window," "the bees flew toward the dog and the boy," "the boy climbed onto the top of a rock," and so on. Since learners were never given explicit instructions about what target grammatical structures they were expected to use, DCs could potentially be avoided. As such, the first task was able to capture learners' natural inclination to use DCs. L2 Chinese participants on average spent about 7 to 12 minutes to complete the first task.

After participants completed the first task, the second picture-cued written task (see Appendix C) was used to further probe learners' ability to generate the six types of DCs and their ability to differentiate the two "up" DCs *shang* and *qi*. There were 16 test items that required the learners to write down 16 sentences, with eight items for Part I and eight for Part II. The first eight items in Part I had the same prompt question: "If you were A, what would you say to best describe B's movement?" Participants were instructed to look at two consecutive pictures, in which different kinds of motion events were illustrated. The first picture presented a static scene, and then the second picture showed B undergoing a spatial movement. A brief explanation about the pictures was provided. For instance, an item in Part I showed "person A" and "person B" talking to each other in the classroom;

later, A saw B “walking out of the classroom” (see Appendix C). Participants were required to use the designated verbs, and to include the cues (Place/Object NP), if provided, to describe B’s movements.

Part II of the picture-cued written task had the same format as Part I did. The difference was that the eight items were about making different kinds of requests that involved spatial movements. The choice of “requests” was motivated by the need to elicit natural use of the hither/thither descriptions. When native speakers of Chinese request someone to do something that involves spatial movement, the encoding of hither/thither perspective is pragmatically and contextually appropriate. For example, an item in Part II showed that “person A” ordered a pizza from “person B,” and asked to B to “bring up the pizza” (see Appendix C). The critical prompt, “bring up the pizza,” was shown in the pictures and implied in the explanation of the pictures. In this case, one is likely to describe not only the upward path but also the hither path, since the request involves the interlocutor to bring the pizza up and bring it toward the speaker. As noted earlier, English verb particles have similar syntactic and semantic functions as Chinese DCs do. In the picture-cued written task, to avoid the potential influence resulting from the English translations, the critical parts of the prompts, such as “B walked out of classroom,” were never written in English, but were illustrated in the pictures.

In order to elicit learners’ use of the six different types of DCs, the 16 test items in the second picture-cued written task comprised different verbs and cues that were presented in motion events with varied orientations. A total of nine different verbs were used, all of which frequently co-occur with DCs. Special effort was also made to ensure that the learners were familiar with these verbs and cues at their proficiency level. Among

the 16 test items, four items gave only designated verbs, five items gave both designated verbs and Place NPs as cues, and seven items included both designated verbs as well as Object NPs. Also, the instructions for both Part I and Part II clearly stated that participants were encouraged to include the word *lai* or *qu* (hither/thither), whenever they felt the contexts allowed them to do so. In general, L2 Chinese participants spent 12 to 20 minutes to finish the second task.

In Task 2, 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 Appendix C), the responses collected from the NSs included: (a) Type 2 complex DCs: *Qing ba pisa* ***song shang-lai*** 'lit. please-*ba*-pizza-**send up-hither**' (b) Type 5 complex DCs with Object NPs: *Qing* ***song pisa shang-lai*** 'lit. please-**send-pizza-up-hither**' (c) Type 6 complex DCs with Place NPs: *Qing ba pisa* ***song shang-wulou-lai*** 'lit. please-*ba*-pizza-**send-up-the-5th-floor-hither**.' When an 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 20 NSs, therefore, provided important baseline data which were used to compare the distribution of each type of DC patterns produced by the learners.

The NSs skipped the background information questionnaire and went through the same two tasks as the learner groups did. NSs spent about 10 to 15 minutes to complete both tasks.

Coding Reliability and Analyses

Two raters worked independently to code and score all responses. The coding results were then compared and any disagreements resolved by discussion. Learners' responses to the seven blanks from the first controlled composition task were dichotomously scored (zero or one) separately for each of three aspects of DC use: (1) whether or not DC was used (2) whether or not DC was appropriately chosen, based on the pattern of responses documented in the L1 baseline (3) whether or not word order of DC was correctly produced, where relevant. In addition, learners' production in this first task was qualitatively examined for influences of the L1 and L2 typological patterns. As for the second picture-cued written task, each of the 16 items was scored polytomously on a scale of zero to two. A score of two was assigned to responses that chose appropriate DCs and showed correct word order. A score of one was assigned to responses that only showed appropriate choice of DCs, but had non-target-like word order. Zero was given to responses that had non-target-like DCs or did not use DCs. When an inappropriate DC pattern was supplied (e.g., a complex DC pattern in which the DC2 was not a hither/thither path or anomalous DC patterns with more than two DCs supplied), there was no clue to further gauge the learner's grammatical knowledge of word order. Therefore, only when the response showed an appropriate choice of DC was its correctness in word order further assessed.

Results

Use of DCs and Overall Proficiency

Table 5 presents the performance on DC constructions in the first

controlled-composition task. Because the scores turned out not to be normally distributed, only descriptive results were inspected. The percentages indicate the frequency for each type of response by each group.

Out of the 140 responses produced by the 20 NSs, 99% contained DC constructions, confirming that the task design successfully elicited the target structures. The NSs consistently used DCs to describe the designated subjects' spatial movements depicted in the frog story. As expected, the DCs produced by the NS baseline group were practically error-free and showed target-like word orders in nearly all cases.

[Put Table 5 here]

Turning to the overall levels of use of DCs by the L2 learners, Table 5 shows that they all used DCs at least some of the time, although they generally used fewer DCs than did NSs. This suggests that the learners were aware that DCs were to be used when describing motion events and that, even at the intermediate level, DCs were already part of their L2 Chinese grammar. On the whole, learners' use of DCs demonstrated a positive association with their levels of proficiency. The intermediate FLL group had the lowest percentage of DC use, at only 63%, and the advanced HLL group had the highest, at 84%. Although the difference in performance between HLLs and FLLs was less pronounced at the advanced level, the HLL groups consistently supplied more DCs than the FLL groups, at both levels.

Further inspecting the choice of DCs in Table 5, we can see that all learner groups displayed some degree of inappropriate use of DCs, showing that a large portion of DCs

reflected non-target-like choice of DCs. Examination of the responses showing non-target-like choices of DCs revealed three major categories of interlanguage solutions: (a) ungrammatical combination of two DCs: e.g., *Mifeng fei **chu shang***. 蜜蜂飛出上。'lit. bee-fly-**out-up**,' *Xiaogou diao **xia chu***. 小狗掉下出。lit. 'dog-fall-**down-out;**' (b) inappropriate omission of the deictic path in Type (2) complex DCs: e.g., *Mifeng fei chu.* 蜜蜂飛出。'lit. bee-fly-out,' *Xiaogou diao xia*. 小狗掉下。'lit. dog-fall-down;' and (c) mismatch between the situation and the choice of DC: e.g., for a picture showing a beehive falling to the ground, *Fengwo diao shang* 蜂窩掉上。'lit. beehive-fall-up.' The advanced HLLs outperformed the other learner groups, with 74% (of their 77 responses) exhibiting appropriate uses of DCs. The intermediate FLLs, again, showed the lowest percentage for appropriate choice of DCs, at only 30%. L2 learners' degree of mastery in choosing context-appropriate DCs was generally higher for learners at higher levels of proficiency. The gap between HLLs and FLLs decreased as level of proficiency increased, although the HLL groups continued to outperform the FLL groups at both levels.

The same patterns were also observed in the percentages of target-like word order. As shown in the final column of Table 5, a small portion of the appropriately chosen DCs was used without correspondingly correct word orders.

Results of the second picture-cued written task are given in Table 6 and Figure 1. Given that the scores for this second task were normally distributed, a two-way ANOVA procedure was adopted to analyze the trustworthiness of the overall effects of proficiency level (intermediate vs. advanced) and participant background (HLLs vs. FLLs). The results yielded a significant main effect for proficiency level, $F(1, 51) = 8.801$, $p < .05$, partial $\eta^2 = .147$. That is, the L2 Chinese learner's ability to use DCs on this task was positively

correlated with their overall Chinese proficiency, as advanced learners performed significantly better than intermediate learners for both HLLs and FLLs.

[Put Table 6 here]

[Put Figure 1 here]

There was also a significant main effect for participant background, $F(1, 51) = 12.91$, $p < .05$, partial $\eta^2 = .202$. That is, HLLs performed significantly better than FLLs consistently across both levels. The interaction between proficiency levels and participants' background was not significant, $F(1, 51) = 0.775$, $p > .05$, partial $\eta^2 = .015$.

Nevertheless, in terms of how much the HLLs and FLLs improved as they moved up to a higher level, the data showed an average gain for HLLs of 3.8 points, whereas FLLs had an average increase of 7.01 points. This observation suggests that FLLs might be able to gradually catch up with HLLs through classroom instruction and longer investment of time in learning.

In sum, the descriptive results for Task 1 and 2 as well as the inferential results for Task 2 revealed the same picture. The L2 learners' ability to use DCs was positively related to their overall L2 Chinese proficiency. Additionally, the HLL groups' performance outperformed the FLL groups at both levels. Although the gap between HLLs and FLLs narrowed as the learners progressed to the advanced level, the HLL groups consistently showed more advanced skills in using DCs than did the FLL groups.

Learners' Performance on Six Types of DCs

The second research question in this study was whether or not the six types of DCs were equally difficult for the 55 L2 learners. The production of each of the six different types of DCs on the picture-cued written task (Task 2) by L2 learners was therefore measured. Since a grammatically correct DC structure requires not only appropriate choice of DCs, but also grammatical word order in the case of Types 3 through 6, learners' degree of mastery in both choice of DC and word order was inspected.

Table 7 reports the distribution of DCs by relative frequency in Task 2. The final column sums up the total number of appropriately used DCs from each type. Out of the 320 responses produced by the 20 NSs, 96% involved DC constructions, indicating that the task design successfully elicited the target DC structures.

[Put Table 7 here]

Comparing the distributions for appropriately chosen DCs for NSs and L2 learners, we find that learners' linguistic strategies in choosing DCs, given a designated motion event, did not always follow those of NSs. Nevertheless, learners across all groups demonstrated an ability to supply appropriate DCs at least some of the time for each type of DC pattern. In terms of the total number of appropriate choice of DCs, FLLs displayed 42% at the intermediate level versus 68% at the advanced level across the two proficiency levels, and the HLLs did so 67% to 74% of the time. FLLs showed a larger degree of positive difference across proficiency level than HLLs with regard to their ability to

appropriately supply DCs for designated motion events, but they were consistently outperformed by HLLs.

In agreement with Lu's (1984) corpus results, the Type (2) complex DCs often co-occurred with *ba*-constructions and were highest in frequency of use among the different DC patterns. These tendencies held true across all groups, including HLLs and FLLs. However, although the learners used Type (2) DCs most frequently, the rate of use for Type (1) simple DCs across all learner groups closely resembled that of NSs, whereas learners were much less likely to produce Type (2) complex DCs than were NSs.

DCs of Types (3) to (6) are patterns with an accompanying NP. As discussed, producing a correct DC with NP structure requires an additional aspect of grammatical performance, which is to accurately arrange the word orders according to the type of DC and the type of NP. The word order accuracy results are provided in Table 8. Since the levels of accuracy for choice of DCs were not equivalent for all participants in each group, in Table 8, the column "n" specifies the actual number of participants who supplied at least one appropriate DC in each type. The mean percentages of correct word order were then drawn on the basis of the total relevant DC cases obtained from this filtered sample of the participants' responses.

[Put Table 8 here]

Table 8 indicates that the NS baseline group had 100% accuracy for word order. The findings for word order showed the same general tendency for HLLs to outperform FLLs at both levels that was seen regarding appropriate choice of DC. In other respects, however,

the results for word order shown in Table 8 patterned differently from the findings reported thus far for the other analyses. First, the size of the difference in word order accuracy of DC Types (3) through (6) for learners at the two levels of proficiency was not as pronounced as for appropriate DC choice. Second, as shown in Table 8, although intermediate HLLs were much better in terms of word order than were their FLL counterparts, the HLLs did not differ greatly across the two levels and instead consistently exhibited similar levels of difficulty with fully acquiring variable word order among the different DC patterns. This suggests that the syntactic complexity of the variable word order poses some challenges to learners, regardless of learning background, and an L2 learner would need a longer period of study to internalize the rules fully, even beyond the current "advanced" level.

Moreover, the complex types of DCs involving a second hither/thither DC exhibited consistent lower levels of accuracy than their simple counterparts. Thus, the average accuracy for word order across all L2 groups for the relatively complex Types (5) and (6) constructions were 74% and 64%, compared to 93% and 86% for the two simple Types (3) and (4), showing that learners generally were more competent in word orders associated with simple DCs than in those associated with complex DCs. Also, learners performed more poorly for constructions involving Place NPs than was the case with Object NPs, for both simple and complex DCs. Word orders for constructions involving Place NPs are indeed syntactically more restricted than for those with Object NPs. Non-target-like solutions for DCs with Place NPs were generated due to overgeneralization of acceptable word orders for Object NPs; this finding is parallel with Yang's (2003) observations. The challenge posed for mastery of word orders for DC constructions can therefore be

attributed largely to the internal syntactic complexity of DC patterns themselves.

In sum, in terms of word order, the relative levels of accuracy among the four types of DCs with accompanying NPs were as follows: Type (3) simple DCs with Object NPs > Type (4) simple DCs with Place NPs > Type (5) complex DCs with Object NPs > Type (6) complex DCs with Place NPs.

Learners' Ability to Adjust to the L2-Specific Ways of Spatial Conceptualization

The third and last research question pertained to learners' ability to adjust to the L2-specific ways of spatial conceptualization, such as *shang*, *qi*, *lai* and *qu*. Two interesting qualitative patterns were found in the data in answer to this question.

First, the data showed that the specifications between the two DCs *shang* (spatially profiling the goal of the upward movement) and *qi* (spatially profiling the source of the upward movement) were easily overlooked by the learners. Learners' misuse of *shang* and *qi* was especially pronounced at the intermediate level. For example, an item in Task 2 required participants to describe a person standing up (see Appendix C). Out of the 30 responses from all of the intermediate learners, 15 responses showed misuse of *shang* for *qi* (target answer: *zhan qi-lai* 站起來 'stand- up-hither'; non-target-like forms: *zha shang-lai* 站上來 'stand-up-hither'or *zhan shang* 站上 'stand-up'), accounting for 75% of the non-target-like responses on this item. In Chinese, *shang* has a wider range of use than *qi*. The learners tended to choose *shang* to describe upward movements that should be specified by *qi*. Misuse of *shang* for *qi* was also observed in responses for two blanks in Task 1: one situation depicted a swarm of bees flying out from the beehive and then flying in an upward direction, and the other showed an owl flying out from a hole and then

upward. In these two scenes, there was no specific goal for the upward motions, so only *qi* was used in the NSs' responses. In the learners' responses, non-target-like forms using *shang* were found: *Meifeng fei chu* ***shang*** 'lit. bee- fly-out-**up**,' *Maotouying fei* ***shang*** 'lit. owl-fly-**up**-hither.' Additionally, one item in Task 2 that required obligatory use of *shang* for a request asking someone to bring *up* a pizza to the fifth floor (see Appendix C). In this case, a goal place (i.e., the fifth floor) was depicted, so the DC *shang* was the appropriate option. Two incidences of misuse of *qi* for *shang* from two advanced FLLs' responses were found: *Qing ba pisa song* ***qi*** *lai* 'lit. please-*ba*-pizza-send-**up**-hither' (the two advanced learners produced the same non-target-like form).

These interlanguage solutions indicate that the learners had considerable difficulty differentiating the spatial distinctions between *shang* and *qi*. When the English spatial concept of '*up*' is recategorized into two categories in the L2, the process of recategorization involved in learning the specifications between *shang* and *qi* would take relatively longer. Exactly how long it could take for an L2 learner to become fully adept in differentiating the two awaits further investigation.

Second, the encoding of hither/thither path was found to be another main source of non-target-like production in the controlled composition task. Of the inappropriate choice of DCs, 32% of the responses among intermediate FLLs and 20% among advanced FLLs involved inappropriate omission of *lai* or *qu* (e.g., *Mifeng fei chu.* 蜜蜂飛出。'lit. bee-fly-out'). This tendency reveals that some of the inappropriate DCs were generated because the L2 learners were not aware that supplying the hither/thither information is often required for native-like speech, especially when the DC utterance is plain without an Object or Place NP. It could also be the case that the learners had difficulty restructuring

their ways of thinking-for-speaking for the target language. In this regard, HLLs were more competent in encoding of hither/thither. Only 13% of the responses among intermediate HLLs were non-target-like due to inappropriate omission of *lai* or *qu*, and no advanced HLL responses exhibited such non-target-like forms. It appears that FLLs across all levels had more difficulty in incorporating the hither/thither perspective when describing motion events than did HLLs.

Discussion

This study investigated how English-speaking learners come to express motion events in L2 Chinese. The consistent pattern of results suggests that the learners' ability to use DCs was positively related to their overall L2 Chinese proficiency. The L1-L2 differences and similarities in typology and in semantics of spatial categorization appear to be the main sources of challenge for the learners. In addition, it was observed that the six types of DCs presented a different degree of difficulty for the L2 learners. Finally, the HLLs outperformed the FLLs in their familiarity with the syntactic regularities of DCs and in their use of the hither/thither paths.

The results of this cross-sectional study can be used to characterize learners' acquisition of DCs as progressing along a hypothesized developmental order of mastery of the six types of DCs. This posited accuracy order, outlined in Table 9, is generated from observed patterns of DCs as used in this study. There is, of course, a need for future longitudinal investigations to confirm this hypothesis.

[Put Table 9 here]

This accuracy order reflects an order of increasing cognitive linguistic complexity in producing the DC forms. Learners first develop competence in producing simple DCs, which represent structures most similar to the learners' L1 English patterns of path encoding. The next stage, complex DCs, builds up on stage one and further requires learners to supply the encoding of hither/thither path as the second DC. Since English does not conventionally encode the deictic path as Chinese does, adjusting to this new thinking-for-speaking pattern will take up more cognitive resources, which involves reallocation of attention to not only the simple direction and the movement, but also the contrast of moving-toward and moving-away interpretation of the action.

The third and fourth stages further involve an inserted Object NP or Place NP. Integrating the NP into a DC form implies an addition of a new reference in describing the motion events and thus factors in the syntactic complexity of the word order. For instance, denoting "*He ran out of the classroom*" would require additional attention to the source *classroom* than simply denoting "*He ran out.*" At the same time, the word orders associated with DCs vary according to the type of inserted NPs and the type of DC (i.e., simple or complex DCs), and such syntactic complexity would require the learners to quickly process the available grammatical positions for inserting the NP in constructing utterances. Since the available positions for inserting a Place NP are much more restricted than those for inserting an Object NP, more interlanguage solutions were found to be generated due to learners' overgeneralization of the variety of word orders accepted for Object NPs into Place NPs, and the average correctness rates in word orders with Place NPs were lower than those with Object NPs (see Table 8). Therefore, Type (3) simple DCs with Object NPs should fall in an earlier order than Type (4) simple DCs with Place NPs.

Finally, the fifth and sixth posited stages include all the challenges from the preceding two stages and increase the cognitive load by supplying the encoding of the DC2 (i.e., hither/thither path). Likewise, Type (5) complex DCs with Object NPs are less restricted in word order than Type (6) complex DCs with Place NPs, and should fall in an earlier stage than Type (6) DCs.

Overall, 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 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 appears to be mainly shaped by the internal syntactic complexity of the target forms and the cognitive load required in production.

The data in the present study also revealed two sources of difficulty in learning DCs that differentiate between HLL and FLL performances. First, it was observed that the HLLs were more at ease with the dual functions of DCs as path satellites and independent verbs than were the FLLs. They were more familiar with the syntactic regularity and restrictions that apply to DCs when they function as path satellites. By comparison, the FLL responses showed some uncertainty about the dual functions of DCs. This was particularly visible in the intermediate FLLs' responses to two blanks in the controlled composition task. These two blanks described two scenes: one showed a swarm of bees flying out from the beehive and then flying in an upward direction, and the second showed a boy falling *down* from the cliff and falling *into* a stream. A Chinese native speaker will segment these consecutive movements by using two separate DC patterns. However, it was found that some L2

learners were inclined to mix different DCs together, as if they were using a string of verbs to describe a series of events. Examples of such non-target-like mixture of DCs as satellites and DCs as verbs for these two blanks are:

(6) a. **Mifeng fei chu shang.* (Intermediate FLL)
bee flew out up

b. **Mifeng fei chu qi lai.* (Intermediate FLL)
bee flew out up hither

c. **Mifeng fei chu fengwo qi lai.* (Intermediate HLL)
bee flew out hive up hither

(7) a. **Xiao nanhai diao xia jin lai.* (Intermediate FLL)
little boy fell down into hither

b. **Xiao nanhai diao xia qu dao xiaoxi.* (Intermediate FLL)
little boy fell down thither to streamlet

c. **Xiao nanhai diao xia jin qu xiaoxi.* (Advanced FLL)
little boy fell down into thither streamlet

In a DC construction, there is only one or two consecutive DCs (i.e., simple vs. complex DCs) allowed, and the second DC in the complex DCs has to be either the hither or thither path. In (6a), the learner used two DCs, *chu* and *shang*, in a row to describe the bees' successive motions, showing that the obligatory use of either the hither or thither path in a complex DC construction was not heeded. The other examples in (6) and (7) each include more than two DCs to describe the motion events. Such instances detract from the syntactic regularity of DC constructions, suggesting that the FLLs were not familiar with

the restrictions that apply to DCs when they function as path satellites. They viewed the DCs as verbs that could be consecutively used with other verbs/DCs. In a serial-verb language like Chinese, it is common to see a series of verbs used in a row to describe sequential events. This typological feature seems to invite the learners to use more than two DCs to describe consecutive motions, as if they were using a string of serial verbs to describe other kinds of sequential events. Such confusion could possibly be attributed to the fact that DCs not only occur as satellites encoding path, but also occur as individual full verbs. In other words, in these learners' grammar representation, DCs do not seem to differ much from other verbs.

Another aspect of use of DCs in which the HLLs obviously outperformed the FLLs was the encoding of the hither/thither paths. In the controlled composition task, the FLLs had considerably more inappropriate omission of the deictic paths than did the HLLs. The incorporation of the deictic paths in Chinese DCs manifests a special thinking-for-speaking pattern that differs from the English-speaking learners' L1 patterns. That is, the L2 Chinese learners need to be aware of the importance of the hither/thither perspective in describing motion events in Chinese, and to train themselves to pay special attention to the deictic aspect of the event, at least in the evanescent time frame of constructing utterances. Perhaps the reason why the HLLs demonstrated a better command than the FLLs is that HLLs have more opportunities to use and hear the target language in natural and meaningful contexts. Different from the intricate distinction between *shang* and *qi*, the encoding of the deictic path more widely and frequently appears with various DCs that encode different directions in the input. HLLs may therefore have a better chance of developing the habitual encoding of the hither/thither path through exposure in context,

which generates better mappings between the hither/thither DC forms and the meanings/concepts. By contrast, FLLs' input is mainly from textbook examples that tend to be more disconnected from concrete motion events in real experiences. As a result, the HLLs were more advanced in incorporating the deictic paths than the FLLs at the same proficiency level.

Conclusion

The results of this study have shown that learners' performance in DCs was positively related to their overall Chinese proficiency, with advanced learners consistently outperforming intermediate learners. DC performance also distinguished participants by learning background. The FLLs appear to have shown a larger degree of difference between the levels than the HLLs, which suggests that substantial classroom learning in this area of grammar is possible for the FLLs during the transition from 210 hours (intermediate) to 330 hours (advanced) of instruction. Nevertheless, HLLs performed significantly better than FLLs at both levels. Compared to FLLs, HLLs consistently showed better skills in supplying context-appropriate DCs and in incorporating the hither/thither perspectives, showing that HLLs exhibited more target-like L2 ways of thinking-for-speaking. HLLs may have more experiences observing actual movements accompanied with meaningful L2 input. Through the embodied linguistic input, HLLs may develop better mappings between forms and meanings or concepts and were more sensitive to what aspects of a motion event they should attend to during linguistic encoding.

Based on the empirically observed patterns that L2 learners displayed in their ability to grammatically operate a DC construction, the following accuracy order was proposed:

(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 accuracy order implicitly sketches the hypothetical developmental pathways L2 Chinese learners may traverse over time and therefore calls for longitudinal investigation in future research.

The findings gleaned in the present study have implications for the learning to express motion events in L2 in instructional contexts. In a language classroom, students either learn spatial words via L1 translation, or in some cases have chances to see visuals (Chen & Oller, 2005) explaining the spatial meanings. For instructed learners in foreign language contexts, particularly, there are seldom opportunities to be exposed to the semantic content of an L2 spatial morpheme where direct mappings between forms and meanings in real language use would be encountered. To address this need, the use of pedagogic tasks promoting functional use of spatial expressions in context would be desirable, as they would provide L2 learners with embodied experience that may facilitate development of the L2 form-meaning mappings and the rethinking-for-speaking process. Increasingly SLA researchers are turning to the wealth of knowledge developed in cognitive linguistics and have begun to seek these insights to shape models of L2 acquisition or to facilitate classroom instruction (e.g., Niemeier, 2004; Tyler & Evans, 2004). More investigations in this line of research are needed so as to better understand how we can facilitate rethinking-for-speaking across diverse learning contexts and conditions.

Notes

1 Some researchers (e.g., Chen & Guo, 2009; Slobin, 2004, 2006) treat the post-verbal directional complements as path verbs having the status of independent verbs. However, as acknowledged by many others (e.g., Li, 1993; Shen, 2003; Talmy, 1991, 2000; Peyraube, 2006), this small set of path verbs have been grammaticalized into path satellites losing substantial verbal meanings and therefore should be treated as complements. Given that directional complements are widely used in many Chinese grammar books (e.g., Chao, 1968; Cheung et al., 1994; Henne et al., 1977; Liu et al., 1983) and Chinese language textbooks (e.g., He et al., 2007; Wang et al., 2005; Wu et al., 2005; Yao & Liu, 1997), in the present study I will assume that the path morpheme that indicates directionality is a directional complement.

2 Talmy (2000) denoted that a closed set of forms that function as satellites in a language can sometimes carry other grammatical function(s). For instance, some English verb particles such as *of*, *from*, and *toward* also function as prepositions; however, other particles such as *apart* and *forth* only serve as satellites. Likewise, Chinese satellites (i.e., verb complements) often overlap with main verbs (p.102).

3 English path verbs such as *exit*, *enter*, *ascend*, and *descend* are loanwords from Romance languages. Compared with path satellites, they are less colloquial (Talmy, 2000).

4 The results collected in Berman and Slobin's study (1994) have been further discussed in Slobin (1996a, 1996b, 1997, 1998, 2000, 2003, 2004).

5 Zlatev and Yangklang (2004) have suggested that Thai cannot be classified as an S-language or a V-language.

6 E.g., In Chinese, one can say, Wo xiang shangchuang shuijiao. 'lit. *I-want-go-to-bed-sleep,'* in which the three juxtaposed separate verbs, *xiang* 'want', *shangchuang* 'go to bed,' and *shuijiao* 'sleep' occur in one sentence without the use of overt morphological marking or coordinating conjunctions. Serial-verb constructions are very common in Chinese.

7 As one anonymous reviewer rightly noted, there is an important difference in the treatment of Chinese post-verbal DCs between Talmy's (1991, 2000) and Slobin's (2004, 2006) proposals. Talmy treats them as path satellites attached to the preceding main verb and therefore considers Chinese to be an S-language. Slobin (and also Chen, 2007) analyzes them as full verbs having the same status as the preceding main verb and therefore accommodates them into a third category, equipollently-framed

languages. The debate over the status of the path elements in Chinese boils down to the semantic and syntactic behavior found in their diachronic origins (Chu, 2004; Slobin, 2006; Peyraube, 2006). In the end, there is no general consensus reached thus far on the typological classification of Chinese (see discussion in Beavers et al., to appear; Chen, 2007; Chen & Guo, 2009; Shen, 2003). In the present study, I will consider them path satellites, following Talmy.

8 According to Chen (2007, p. 55, Table 2), among motion events denoting path components found in 59 elicited narratives of the frog story, 87.6 % encode the path via complements that appear after the main verbs, while only 12.4% encode the path via the main verb. Additionally, Chen and Guo (2009, p. 1760, Table 4) have observed that, among self-initiated motion events expressing path information found in nine Chinese novels, 75.46% of such events have their paths encoded by means of satellites, while 24.54% of them have the path encoded in a main verb. These data show that, in Chinese, S-framed encoding is more frequently adopted than V-framed encoding.

9 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**→*Ta* ***na yi-ben-shu jin lai*** *le*. 'lit. He-**take-a-book-into-hither-**Perf.'

(b) *Ba*-construction (**SOV**)→*Ta ba yi-ben-shu* ***na jin lai*** *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, *na-jin-lai* 'take-into-hither.'

10 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).

11 In this institution, Chinese language students must obtain a course grade of C or better in order to progress to a higher level. Students who fail to perform better than that will not be qualified for the next level of language study and would be required to take the

class again. In addition, students who studied Chinese elsewhere or have Chinese language experience prior to entering the program (e.g., heritage students) can take a placement test, if they desire to continue studying at a higher level. Students will be assigned to an appropriate level in accordance to the result of their placement test.

12 The criteria used to classify HLLs and FLLs into two subgroups focused on the potential effects of L2 use and prior exposure on learning DC constructions. Given that institutional status was employed as a measure of global L2 proficiency (see Thomas, 2006), HLLs and FLLs at the same program level were deemed having the same level of L2 proficiency.

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Appendix A
Background Information Questionnaire

***Note*.** 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.

Q1. What is your first or strongest language?

□ English □ Japanese □ Chinese (specify dialects) _____

□ Korean □ Other (specify)_____

Q2. Check if your parents, grandparents, or anyone else in your immediate/extended family is a native speaker of Chinese.

□ Mother □ Father □ Maternal grandparent(s) □ Paternal grandparent(s)

□ Other (specify)_____

Q3. Provide information for all Chinese language courses you have taken at the college level (including all UH campuses):

University Course

_____

_____

Q4. List the following information for any previous Chinese studies elsewhere (e.g., high school, intermediate/elementary school, private language institute, private tutor, etc).

School 1:_____ Number of years taken:_____

School 2:_____ Number of years taken:_____

Q5. Have you lived/stayed in China for a month or longer?

□ No □ Yes (For _____ [length of the stay]

Q6. How much do you use or hear Chinese? (Please mark all that apply).

( ) Absolutely none

( ) Exposed to Chinese at home

(Please explain:_____)

( ) Exposed to Chinese at work

(Please explain:_____)

( ) Exposed to Chinese elsewhere

(Please explain:_____)

Appendix B
Controlled Composition Task

Instruction: The following passage was written based on the picture story, *Frog, where are you?* (Mayer, 1969) Some parts of the story are missing and left blank. To complete the story, please **refer to the pictures** and **use the designated verbs to fill in the blanks**. The first blank has been filled in for you as an example.

Sample

小男孩和他的小狗(puppy)在房間養(raise)了一隻青蛙(frog)。有一天晚上，小男孩和小狗在睡覺的時候，青蛙 **_____ (爬)<p2>**。

…貓頭鷹看見有人，就 **_____(飛)<p12>**。…

Appendix C
Picture-Cued Written Task

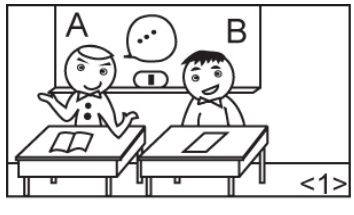
***Note*.** Pictures shown in this task were created by the artist © Shu-Ping Wu.

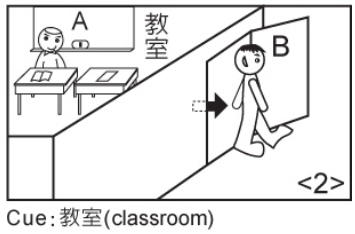
Part I

Instruction: 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. 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. Also, try to use the complement來 or 去 in your sentences, whenever the context allows you to do so.

Sample

1.





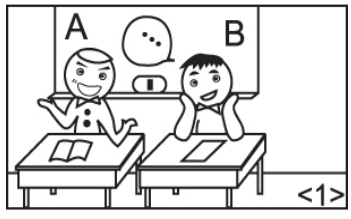
Cue：教室(classroom)

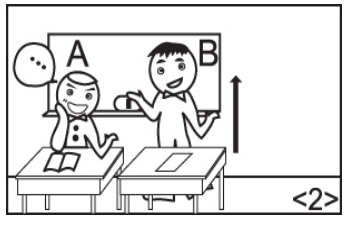
Picture <1>
A and B were talking to each other in the classroom.

Picture <2>
Later, A saw B…
Q: If you were A, what would you say to describe B's movement?

B_____(use 走)。

2.





Picture <1>
A and B were sitting together in the classroom. Later the teacher called B's name.

Picture <2>
So, A saw B…
Q: If you were A, what would you say to describe B's movement?

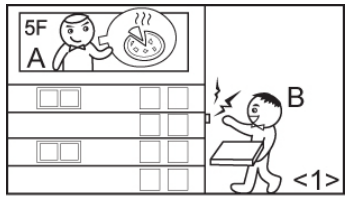
B_____(use 站)。

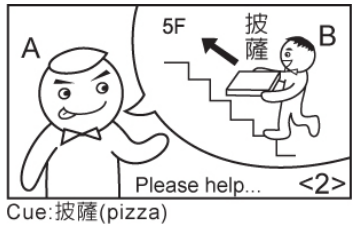
Part II

Instruction: 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. Also, try to use the complement 來 or 去 in your sentences, whenever the context allows you to do so.

Sample

1.





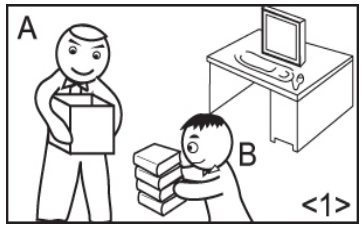
Cue:披薩(pizza)

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)。

2.



Cue：書(book)

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)。

Table 1 DCs in Chinese

來 ***lai***	'hither' (moving toward the speaker)
去 ***qu***	'thither' (moving away from the speaker)
上 ***shang***	'up'(moving upward) [a]
下 ***xia***	'down' (moving downward)
起 ***qi***	'up' (moving upward) [a]
進 ***jin***	'into' (moving from outside to inside)
出 ***chu***	'out' (moving from inside to outside)
回 ***hui***	'back' (returning to an original place)
過 ***guo***	'pass' (passing through a point)
到 ***dao***	'to' (arriving at a point)
開 ***kai***	'away' (departing from a point)

[a] The English path satellite "*up*" is subdivided into two categories in Chinese: *shang* (上) and *qi* (起).

Table 2 The six types of DC constructions

Type	Example
1. Simple DCs	*ta zou **dao** le* he walk **to** Perf. "He arrived."
2. Complex DCs	*ta zou **jin lai** le* he walk **into hither** Perf. "He walked in [hither]."
3. Simple DCs with Object NPs	*ta ban **chu** le **yi-zhang-da-zhuozi*** he move **out** Perf. **a-Cl.-large-table** "He moved out a large table."
4. Simple DCs with Place NPs	*ta zou **hui sushe** le* he walk **back dormitory** Perf. "He walked back to the dormitory."
5. Complex DCs with Object NPs	*ta ban **chu yi-zhang-da-zhuozi lai** le.* he move **out a-Cl.-large-table hither** Perf. "He moved out a large table [hither]."
6. Complex DCs with Place NPs	*ta zou **hui sushe lai** le* he walk **back dormitory hither** Perf. "He walked back [hither] to the dormitory."

Table 3 Participant sample

Level	Heritage Language	Foreign Language	All
Intermediate	14	16	30
Advanced	11	14	25
NS [a] baseline	n/a [b]	n/a	20

[a] NS=native speaker

[b] n/a=not applicable.

Table 4 Tasks and procedure

Step	Instrument	k [a]	Time for completion	Research focus
1.	Background information questionnaire	6	1 to 2 min.	- Identification of HLLs & FLLs
2.	Controlled composition task	7	7 to 12 min.	- Suppliance of DCs - Examination of L1 & L2 typological influences: (1) encoding of deictic path in Type 2 DCs (2) interplay between the dual functions of DCs and the features of Chinese as a serial-verb language
3.	Picture-cued written task (Parts I & II)	16 (8+8)	12 to 20 min.	- Comparison of choice of DC types among NSs and L2 learners - Accuracy of word order for Types 3 to 6 - Differentiation between *shang* and *qi*, the two DCs of upward path

[a] k = number of items in each task.

Table 5 Performance on DC constructions in controlled composition task

Groups	**N**	**total *k*** [a] **per group**	**% DCs used**	**% Appropriate choice of DCs**	**% Correct responses (appropriate choice of DCs + correct word order)**
NSs	20	140	99	99	99
Intermediate					
HLLs	14	98	83	60	54
FLLs	16	112	63	30	26
Advanced					
HLLs	11	77	84	74	73
FLLs	14	98	78	50	48

[a] $k = 7$ per participant

Table 6 Scores of DC constructions in picture-cued written task

Groups	**N**	**Minimum**	**Maximum**	**Mean**	**SD**
Intermediate					
HLLs	14	12	32	20.29	6.24
FLLs	16	0	24	12.13	7.31
Advanced					
HLLs	11	10	30	24.09	6.59
FLLs	14	5	26	19.14	6.49

Note. Total possible individual score was 32, based on 16 items scored polytomously as 2, 1, or 0.

Table 7 Distribution of appropriate choice of DCs in picture-cued written task

Group	N	total *k* [a] per group	(1) Simple DCs		(2) Complex DCs		(3) Simple DCs +Object NPs		(4) Simple DCs +Place NPs		(5) Complex DCs +Object NPs		(6) Complex DCs +Place NPs		Total	
			raw [b]	% [c]	*raw*	%	*raw*	%	*raw*	%	*raw*	%	*raw*	%	*raw*	%
NSs	20	320	9	3	145	45	24	8	58	18	25	8	46	14	307	96
Intermediate																
HLLs	14	224	4	2	58	26	13	6	27	12	20	9	29	13	151	67
FLLs	16	256	10	4	29	11	26	10	15	6	4	2	24	9	108	42
Advanced																
HLLs	11	176	10	6	56	32	4	2	28	16	13	7	20	11	131	74
FLLs	14	224	5	2	64	29	12	5	33	15	7	3	31	14	152	68
All Learners	55	880	29	3	207	24	55	6	103	12	44	5	104	12	542	62

[a] *k* =16 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.

Table 8 Mean percentages of correct word order in picture-cued written task

Group	**(3) Simple DCs +Object NPs**		**(4) Simple DCs +Place NPs**		**(5) Complex DCs +Object NPs**		**(6) Complex DCs +Place NPs**	
	n [a]	**%** [b]	**n**	**%**	**n**	**%**	**n**	**%**
NSs	13	100	16	100	13	100	12	100
Intermediate								
HLLs	12	100	8	100	8	91	9	67
FLLs	11	87	10	65	3	33	12	58
Advanced								
HLLs	4	75	9	96	6	83	7	74
FLLs	4	100	10	88	3	44	12	63
All Learners	31	93	37	86	20	74	40	64

[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.

Table 9. DC accuracy order, from high accuracy rate to low

Type	Example	Description
1. Simple DCs	*ta zou **dao** le* he walk **to** Perf.	DC1 supplied; similar to learners' L1 English
2. Complex DCs	*ta zou **jin lai** le* he walk **into hither** Perf.	DC2 (hither/thither paths) added
3. Simple DCs with Object NPs	*ta ban **chu** le **yi-zhang-da-zhuozi*** he move **out** Perf. **a-Cl.-large-table**	Object NPs added; more flexible word order
4. Simple DCs with Place NPs	*ta zou **hui** **sushe** le* he walk **back** **dormitory** Perf.	Place NPs added; restricted word order
5. Complex DCs with Object NPs	*ta ban **chu** **yi-zhang-da-zhuozi** **lai** le* he move **out** **a-Cl.-large-table** **hither** Perf.	DC2 (hither/thither paths) & Object NPs added; more flexible word order
6. Complex DCs with Place NPs	*ta zou **hui** **sushe** **lai** le* he walk **back** **dormitory** **hither** Perf.	DC(hither/thither paths) & Place NPs added; restricted word order

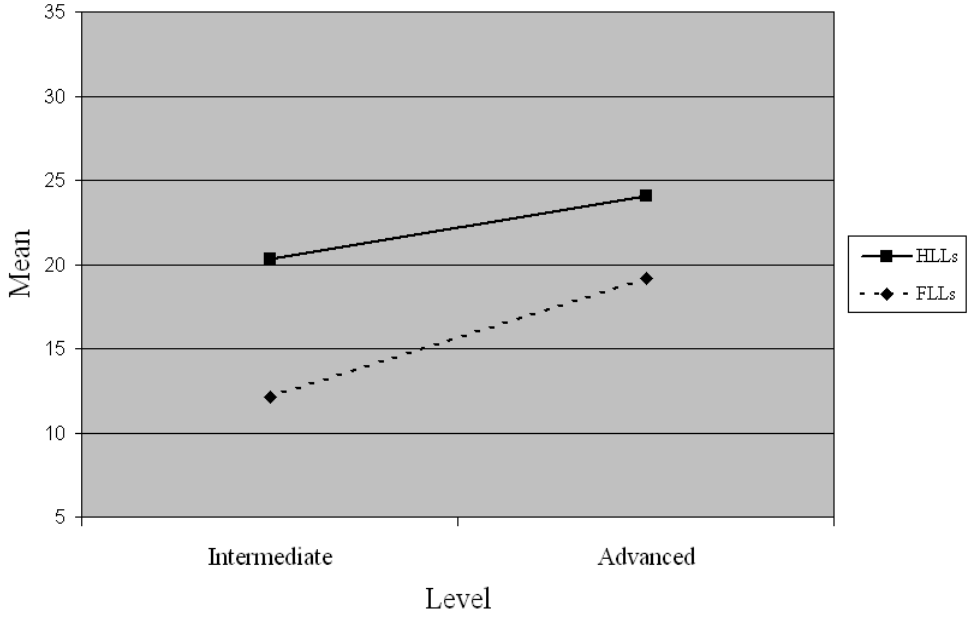


Figure 1 Effect of background by level