國立交通大學

外國語文學系外國文學與語言學碩士班

碩士論文

中文移動動詞之首選詞序探討

The Preferred Motion Sequences
in Mandarin Chinese

研究生：倪孝勇

指導教授：劉美君教授

中 華 民 國 一 百 零 二 年 七 月

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<div align="center">摘要</div>

　　本研究以 Liu et al.(2012)所提出之中文移動事件概念基模(Proto-Motion Event Schema in Mandarin)為本，探討中文移動動詞中的同素逆序詞組，探討詞序互換的構詞機制與其所代表的語意功能分工。如下例所示，「退回」與「回退」是兩個可相互交換詞序的動詞詞組，其語意表現也有所不同。例子(1a)表現典型的空間移動事件；然而例子(1b)則表現出非空間的抽象性移動關係。

(1)　a. 垃圾車只好<u>退回</u>。
　　　b. 時間如流水，永遠都不會<u>回退</u>。

　　中文移動動詞的詞序組合一直以來都是漢語語言學中的重要議題，基於中文句式允許數個動詞排列的特性，Chen and Guo (2009)提出中文移動動詞的八種可能的組合關係，另一方面 Lin (2011)則提出了中文移動事件階層結構(Motion Morpheme Hierachy)並藉以指出中文移動動詞詞組內部的順序性。本研究以中研院現代漢語平衡語料庫(Sinica Corpus)為本，搭配中文移動事件概念基模(Liu et al. 2012)，界定中文移動動詞詞組中所涵蓋的語意內涵，並藉由不同的詞彙化模式(lexicalization patterns)指出互換詞組的兩種序列順序結構，並藉由語料庫的觀察，發現移動動詞兩種順序體現在指涉空間移動與非空間性移動的搭配關係，論證中文詞序的詞彙組合事實上展現出兩種移動事件語意使用的分工關係。

　　本研究著眼於中文移動動詞序列結構中的詞序互換結構，本研究的完成能幫助補足中文移動動詞詞序的研究，從語法的基礎上看出中文動詞詞組的語意表現，並且從詞組所指涉的不同移動事件語意，找出詞序的構詞結構與移動事件語意分工的關聯性。

關鍵字：中文動詞詞序、動詞詞序互換、同素逆序詞、中文動詞構詞機制

The Preferred Motion Sequences in Mandarin Chinese

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Abstract

The paper adopts the Proto-Motion Event Schema in Mandarin by Liu et al. (2012) to investigate the semantic-to-morphological distinction between the alternating pair of Mandarin motion sequences such as *tuì-huí* 退回 'recede-return' vs. *huí-tuì* 回退 'return-recede', as both are found in the corpus:

(1) a. 垃圾車只好**退回**。

　　　lèsèchē　　　*zhǐhǎo*　　　*tuì-huí*
　　　trash.truck　　reluctant　　　recede-return
　　　'A trash truck has no choice but to recede.'

　　b. 時間如流水，永遠都不會**回退**。

　　　shíjiān　*rú*　*liúshuǐ*　　　*yǒngyuǎn*　*dōu búhuì*　　　*huí-tuì*
　　　time　　as　flowing.water　forever　　all　never　　return-recede
　　　'Time doesn't flow back as water never does.'

As illustrated above, *tuì-huí* 退回 in (1a) denotes a spatial movement while *huí-tuì* 回退 in (1b) is used for temporal predication. The spatial vs. non-spatial distinction is further confirmed by a corpus-based investigation that shows that morphological sequencing of motion verbs is correlated with semantic properties that are essential in defining motion events. Earlier studies on motion sequences suggested that motion is multifaceted and sequential in nation. Chen and Guo (2009) have exhausted eight possible combinations of Mandarin motion verbs. Lin (2011) applied scale structure to account for motion sequences and proposed a fixed order for motion morphemes based on the Motion Morpheme Hierarchy. Liu et al. (2012a) further specifies the core semantic components in defining and describing a motion event and proposed a Proto-Motion Event Schema to explain the morphological, semantic and syntactic behavior of motion verbs. The Schema displays a default sequence linearizing the crucial components of motion:

(2)
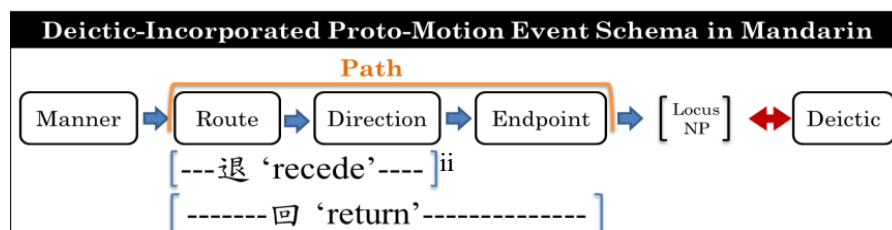
The left-to-right sequence specified in the Schema provides a sequential order for combining motion verbs, each of which lexically encodes a certain range of the components. In *tuì-huí* 退回, the morphological sequence follows the default order of the Schema, as V_1 *tuì* 退 encoding Route and Direction is followed by a wider-ranged V_2 *huí* 回 encoding Route, Direction, and Endpoint. The semantic portion of V2 outranges that of V1 toward the right. As for the reverse sequence *huí-tuì* 回退, the semantic range of V1 *huí* 回 would override that of V2 in a recessive way, clearly not abiding the default order.

A close look into corpus data confirmed the semantic-to-morphological correlation underlying the alternative sequential mechanism of Mandarin motion sequences. We claim that motion sequences following the default order, such as *tuì-huí* 退回, tend to predicate a spatial motion while the reversed order, such as *huí-tuì* 回退, tend to be used predominantly for non-spatial events.

The present paper aims to account for the compositional constraints of motion sequences with observed semantic-to-morphological correlations. We attempt to postulate a morphological version of lexical diffusion that modifies the morphological sequence in order to differentiate semantic and discourse functions.

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敲打著鍵盤的此時此刻，我想到從當初滿腹疑問、踟躕不定探索論文的自己，一步步走到論文得以付梓的這一天，至今想起，其中的酸甜苦辣都是彌足珍貴的寶藏。在這條滿是荊棘的道路，我很慶幸遇到了美君老師，老師總是帶著最嚴謹的研究態度，不厭其煩的教導我們做研究的方法、提點我們思路上的盲點、並幫助我們突破研究上碰到的困難。在 304 擔任研究助理的期間，老師不但在學術研究上盡心指導我們，同時透過行政工作讓我們體會待人接物的方法，能夠成熟穩重的處理繁瑣的人、事、物。老師教導我們如同自己的孩子，亦步亦趨地呵護著我們成長，謝謝你！美君老師。

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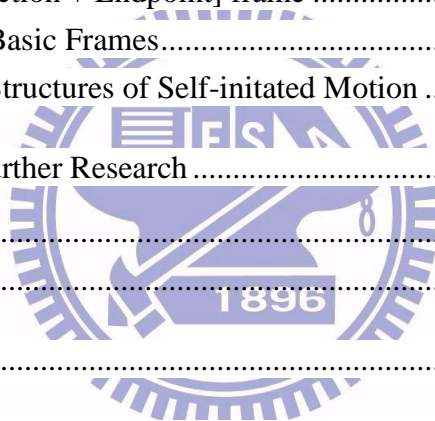
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Chapter 1

Introduction

1.1 Background

Motion is one of the fundamental and basic cognitive concepts which constitute daily events of human life. The concept of motion is realized to a variety of spatial activities and even metaphorically extended to non-spatial relations. Some previous studies on motion events include conceptual structure (Langacker 1987), event structure (Jackendoff 1993), typological classification (Talmy 1985, Slobin 2004), lexicalization patterns (Talmy 2000), and scalar structure (Rappaport Hovav and Levin 2010). Chen and Guo (2009) have approached Mandarin motion combinations while Lin (2011) proposed Motion Morpheme Hierarchy for classifying and linearizing Mandarin motion morphemes. Liu et al. (2012a)[1] has proposed the Deictic-Incorporated Proto-Motion Event Schema to integrate and linearize the essential semantic components in Mandarin motion. Motivated by the previous literature, this study attempts to investigate the sequential alternation in Mandarin motion sequences by adopting the PMS by Liu et al. (2012a).

1.2 Issue: Alternated Mandarin Motion Sequences.

Mandarin motion verbs may fall into a variety of combinations in sequence to depict the motion progression of human mind. Liu et al. (2012a) suggests that a multi-morpheme combination of motion verbs 球滾落進到洞裡 *qiú gǔn-luò-jìn-dào* 'The ball rolled and fell

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[1] Liu et al. (2012a) refers to

Liu, Meichun, Chia-yin Hu, Shu-ping Chou, Hsin-shan, Tsai. 2012a. The Proto-Motion Event Schema in Mandarin Chinese. Paper presented at The 24th North American Conference on Chinese Linguistics, June 8-10, 2012, the University of San Francisco, San Francisco.

down into the hole' are linearized in a fixed order. Verbs of motion are actually organized in an underlying sequence as exemplified by the contrast between *fēi-luò* 飛落 'fly to fall' and **luò-fēi* *落飛 #'fall to fly.' To approach the sequential constraints in Mandarin multi-morhpemene constructions, Lin (2011) also ruled out some unpermissive motion sequences such as **huí-tuì* 回退 #'return to recede' by Motion Morpheme Hierarchy.

However, a closer look into corpus data suggests a different story. Many impermissive motion sequences ruled out by Lin (2011) are found in the corpus as shown in (1b).

(1)   a. 垃圾車只好**退回**。

   lèsèchē   *zhǐhǎo*   *tuì-huí*

   trash.truck   reluctant   recede-return

   'A trash truck has no choice but to recede.'

   (Google 2013/01/20)

   b. 時間如流水，永遠都不會**回退**。

   shíjiān   *rú*   *liúshuǐ*   *yǒngyuǎn*   *dōu*   *búhuì*   *huí-tuì*

   time   as   flowing.water   forever   all   never   return-recede

   'Time doesn't flow back as water never does.'

   (Google 2012/05/12)

In fact, many motion combinations are quite flexible in its sequential organization. Mandarin motion verb *tuì* 退 'recede' may precede *huí* 回 'return' in a motion sequence *tuì-huí* 退回 'recede to return' or alternatively follow *huí* 回 'return' in a reversed sequence *huí-tuì* 回退 'return to recede.' As observed by the above cases of *tuì-huí* 退回 'recede to return' and *huí-tuì* 回退 'return to recede', the sequential mechanism of some motion verbs are flexible in its alternative way of combining each other. Such cases of alternated motion sequences are predominantly observed in corpus data as exemplified below:

(2) a. 吉祥樹又緩緩**降回**地面。

　　 jíxiángshù　　　yòu　　huǎnhuǎn　jiàng-huí　dìmiàn

　　 The.Fortune.Tree　again　slowly　land-return　ground

　　 'The Fortune Tree fell back to the ground slowly.'

　　 (Google 2012/12/27)

b. 九月製造業景氣**回降**。

　　 jiǔyuè　　　zhìzàoyè　　　　　jǐngqì　　huíjiàng

　　 September　manufacturing.business　prosperity　return-fall

　　 'The prosperity of manufacturing business fell back to the previous level.'

　　 (Google 2012/12/27)

(3) a. 有毒氣體卻正每天**落回**地面，

　　 yǒudú　qìtǐ　què　zhèng　měitiān　luò-huí　　dìmiàn

　　 poisonous　air　Adv　Pros　every.day　fall-return　ground

　　 'The poisonous air falls to the ground every day.'

　　 (Google 2012/11/06)

b. 市場糧價**回落**，

　　 shìchǎng　liàng　jià　huí-luò

　　 market　　provisions　price　return-fall

　　 'The price of provisions has declined.'

　　 (Google 2012/11/06)

(4) a. 泰國洪水稍**退下**。

　　 tàiguó　　hóngshuǐ　shāo　tuì-xià

　　 Thailand　flood　slightly　recede-go.down

　　 'The floodwaters across Thailand has slightly receded'

3

(Google 2013/01/06)

b. 智力**下退**。

    zhìlì   xià-tuì

    IQ   go.down-recede

    'The IQ has declined.'

    (Google 2012/11/06)

(5) a. 幸運，演出結束大雨**降下**，

    xìngyùn   yǎnchū   jiéshù   dà   yǔ   jiàng-xià

    luckily   performance   finish   large   rain   descend-go.down

    'Luckily it started raining heavily as the performance came to an end.'

    (Google 2013/01/06)

b. 咖啡出口大幅度**下降**。

    kāfēi   chūkǒu   dàfúdù   xià-jiàng

    coffee   export   dramatically   go.down-descend

    'The level of coffee exports has dramatically declined.'

    (Google 2013/01/06)

(6) a. 月亮**升上**了天空

    yuèliàng sheng-shàng   le   tiānkōng

    moon   ascend-go.up   ASP   sky

    'The moon has risen to the sky.'

    (Google 2013/01/06)

b. 全球股價**上升**。

    quánqiú gǔjià   shàng-shēng

    global   share.value   go.up-ascend

'The global values are rising.'

(Google 2013/01/13)

Moreover, a preliminary investigation into the collocational association of these alternated motion sequences suggests a different story. As noted in the examples of 6(a). Motion sequences such as *shengshàng* 升上 'rise to go up' may predicate spatial events in (6a), which is observable as physical movements. The reversed sequence *shàngsheng* 上升 'go up to rise' tend to predicate non-spatial motion events in (6b), which denotes a metaphorically extended non-physical movement. Participant roles such as *yuèliàng* 月亮 'moon' in 6(a) and *gǔjià* 股價 'share values' in (6b) are identified as evidence of the semantic distinction in predicating spatial and non-spatial usages

To be specific, there seem to be a form-meaning correspondence in the alternated ways of motion combinations as realized in spatial and non-spatial movement. In the recent studies concerning sequential issues of Mandarin motion verbs (e.g., Chen and Guo 2009; Lin 2011; Liu et al. 2012a), none of them can provide a fine-grained analysis of the sequential mechanism of alternated sequence. Therefore, it calls for a corpus-based investigation on the alternated motion sequences in a systematic way. The present paper aims to explore the following questions.

i.   *What is the distributional pattern of the alternated sequences of Mandarin motion events?*

ii.   *Which are the collo-constructional variations and semantic distinction between alternated motion sequences?*

iii. *How can the preferred sequences in various combinations of serial motion events be accounted for?*

To account for the above concern, the study will investigate the sequential mechanism of alternated motion sequences by examining the distributional patterns and the collocational variations in describing serial motion events.

1.3 Scope and Goal

The scope of the present paper is limited to the target pairs of bimorphemic alternated Mandarin motion sequences. They are composed of those commonly appearing Mandarin motion verbs discussed in the Deictic-Incorporated Proto-Motion Event Schema proposed by Liu et al. (2012a). First of all, a close look into all these motion verbs in the Schema helps make a list of all bimorphemic sequential combinations such as *fēi-guò* 飛過 'fly across' and *jiàng-luò* 降落 'descend to fall'. Second, we narrow down all the possible combinations into a limited set of motion sequences permitted for sequential change. We aim at these motion combinations that are allowed for sequential alternation such as *jiàng-luò* 降落 'descend to fall' and its reversed sequence *luò-jiàng* 落降 'fall to descend.' Both sequences of linearizing these motion verbs are permissive motion combinations as observed from corpus data. We come up with a list of ten pairs of motion sequences in two groups according to their alternatind mechanism as listed in Table 1.

	Group (a)			Group (b)		
1.	*tuì-huí*	退回	'recede to return'	*huí-tuì*	回退	'return to recede'
2.	*luò-xià*	落下	'fall to go down'	*xià-luò*	下落	'go down to fall'
3.	*tuì-xià*	退下	'recede to go down'	*xià-tuì*	下退	'go down to recede'
4.	*jiàng-xià*	降下	'descend to go down'	*xià-jiàng*	下降	'go down to descend'
5.	*jiàng-huí*	降回	'descend to return'	*huí-jiàng*	回降	'return to descend'
6.	*luò-huí*	落回	'fall to return'	*huí-luò*	回落	'return to fall'
7.	*sheng-huí*	升回	'ascend to return'	*huí-sheng*	回升	'return to ascend'
8.	*sheng-shàng*	升上	'ascend to go up'	*shàng-sheng*	上升	'go up to ascend'
9.	*jiàng-luò*	降落	'descend to fall'	*luò-jiàng*	落降	'fall to descend'
10.	*tuì-luò*	退落	'recede to fall'	*luò-tuì*	落退	'fall to recede'

Table 1: Ten Pairs of Alternated Motion Sequences

The purpose of the study is to explore the semantic-to-morphological matching of these alternated motion sequences from Group (a) and Group (b). We aim at the distributional frequency, collocational patterns, and semantic distinction manifested in various Mandarin motion sequences with a corpus-based investigation. Ultimately, we will depict the spatial vs. non-spatial distinction confirmed by a corpus-based investigation that shows that morphological sequencing of motion verbs is correlated with semantic properties that are essential in defining motion events. We attempt to postulate a morphological version of lexical diffusion that modifies the morphological sequence in order to differentiate semantic and discourse functions.

1.4 Organization of the Thesis

The study is sequenced as followed. The first chapter presents the background knowledge relevant to the issue. The second chapter illustrates the previous literature. The third chapter is mainly about the corpora and methodology we apply in this study. The forth chapter present corpus observation on collo-constructional patterns. The fifth chapter will account for the syntactic-to-semantic correlation in pairs of alternated motion sequences and also postulates the semantic-to-morphological mapping relations in alternated motion sequences. Last but not least, Chapter 6 concludes the thesis with related issues as implications for further research.

Chapter 2

Literature Review

For several years a vast volume of studies have shown their concern on motion from different perspectives with a wide variety of approaches. Morphological sequencing in verbs of motion is one of the most discussed issues in Chinese linguistics over the decades. This chapter introduces a summary of cross-linguistic investigation of motion and researches on Mandarin motion verbs. Section 2.1 introduces the cognitive-based approach to lexicalization pattern of motion by Talmy (2000) and the typological classification of motion events. Section 2.2 reviews diverse studies on temporal sequence in Mandarin. Section 2.3 shows previous concerns on the multi-combinations of Mandarin motion verbs. Section 2.4 introduces several studies on sequential constraints underlying the serial motion constructions. Section 2.5 is an exhibition of the Frame-based approach to motion by Fillmore and Atkins (1992). Finally section 2.6 is a short summary of this chapter.

2.1 Motion: The Lexicalization Pattern and Language Typology

Talmy (2000) has proposed his cognitive semantics framework to account for motion events. According to Talmy (2000), four internal components Figure, Move, Path, and Ground are identified. 'The **Figure** is a moving or conceptually movable object whose path or site is at issue. The **Ground** is a reference frame, or a reference object stationary within a reference frame, with respect to which the Figure'The **Path** is the path followed by the Figure object with respect to the Ground object. The component of **Move** refers to the presence per se of motion or locatedness in the event.' Besides the four internal components of motion as mentioned above, a motion event can also be associated with two external co-event components: **Manner of the Motion** and **Cause of the Motion**.

Talmy's notion of motion events can be illustrated as follows:

(7)   a. The pencil <u>rolled</u> off the table.

   [Move+Manner]

   b. The pencil <u>blew</u> off the table.

   [Move+Cause]   (Talmy 2000, vol. II: 26, 4)

As illustrated by example (7), the motion events are exhibited by the verb *rolled* and *blew*, with *rolled* expressing the Manner of motion in (7a) and *blew* denoting the Cause of the motion in (7b). External co-event components Manner and Cause can be conflated with Move into verbs of motion to specify the unique way of movement and the force that makes the motion happens. In short, Talmy's system of motion can be illustrated in the following figure.
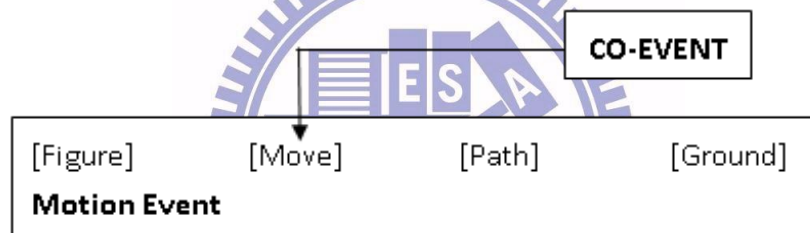
Figure 1: The Concept of Motion by Tamly (2000)

By looking into how those semantic components are lexicalized in motion events, Talmy proposed a two-way typology to accommodate the world languages into two subcategories: satellite-framed and verb-framed languages. According to Talmy (2000), a satellite-framed language, such as English, encodes the Path component into the satellite instead of the main verbs as illustrated in (8a). On the other hand, a verb-framed language, such as Spanish, usually has Path component conflated with Move component into the main verb as shown in (8b).

(8)   a. English:

   <u>The rock</u> <u>slid</u>   <u>down</u>   <u>the hill</u>.   (Talmy 2000:28)

   [Figure] [Move+Manner]   [Path]   [Ground]

b. Spanish:

<u>La botella</u> <u>entró</u>   en <u>la cueva</u> (flotando). (Talmy 1985:69)

[Figure] **[Move+Path]** **[Ground]** **[Manner]**

According to Talmy's classification, Mandarin is treated as a satellite-frame language since he argued that Path and Manner are inflated into the main verbs in Mandarin. However, some other researchers suggest that Mandarin behaves quite differently from how it appears in Talmy's typological system. Mandarin Chinese is argued to have an action-result compound in which V1 conflates Motion and Co-event while V2 conflates Motion and Path (Tai 2003). Tai found that Chinese presents a problem for Talmy's typological classification of motion verbs since it appears to be treated as a satellite-framed as well as verb-framed language. Tai argued that V2 in Chinese action-result compound is the center of predication and therefore better treated as a main verb. Tai has argued that verbs in Chinese verb compounds have equal verbal properties. For example, both 飛 *fēi* 'fly' and 過 *guò* 'pass' in the verb compound 飛過 *fēi-guò* 'to fly across' should be equally regarded as main verbs in the motion event. Concerning the typological classification of Mandarin, Slobin (2004) has investigated the lexicalization patterns in Mandarin and proposed the third type of classification to place Mandarin motion events into a newly established system. He has indicated that Mandarin belongs to the equipollently-framed languages where both Manner and Path components are equally encoded in verbs of motion in Mandarin serial motion constructions.

2.2 Temporal Sequence in Mandarin as an Iconic Motivation

In addition, there are studies adopting cognitive approach to Mandarin. The conceptual mechanism of temporal sequence in Mandarin is recognized by Tai (1985) to tackle the issues regarding Chinese word order as an iconic motivation to Chinese grammar. According to Tai

(1985), the principle of temporal sequence suggests that the relative word order between two syntactic units is determined by the temporal order of the states which they represent in the conceptual world. Tai (1985) believes that the principle also holds true in accounting for Mandarin serial verb construction. He pointed out that two verb phrases expressing consecutive actions will be ordered according to their temporal order in the conceptual world as illustrated by the grammatical contrast between example (9a) and (9b).

(9)   a. Zhāngsān *shàng-lóu shuì-jiào*

          VP$_1$ VP$_2$

   John went upstairs to sleep.

   b. *Zhāngsān *shuì-jiào shàng-lóu*

          VP$_1$ VP$_2$ Tai (1985)

By proposing the principle of temporal sequence, Tai aims to postulate how the Chinese morphemes are conjoined in a sequence that aligns with the temporal order of these events in the conceptual world. Tai believes Chinese, with fuzzy boundary defining grammatical categories, have employed the principle of temporal sequence as an essential strategy to linearize syntactic units to some conceptual principles. On the other hand, Tai's proposal of PTS in Chinese is also an iconic motivation that explains structure of language directly reflects the temporal structure of reality. Along the vein, Tai (1985) concludes that Chinese appears to demonstrate this iconicity with a rather direct mapping between semantic structures and surface structures.

2.3 Multi-combinations of Mandarin Motion Verbs

Concerning the how the Mandarin morphemes are conjoined, Chen and Guo (2009) proposed that the serial verb construction normally lexicalize three of verbal components in

the order of Manner + Path + Deictic. Chen and Guo (2009) propose a few of morphological combinations where three semantic components are identified according to their semantic properties.

(10) a. Manner: the way in which a figure carries out a motion

b. Path: the trajectory over which a figure moves, typically with respect to

another reference object (i.e., the ground)

c. Deictic: path relative to the speaker

They attempt to utilize three of the semantic components—Manner, Path and Deictic—to exhaust all the permissive combinations of motion verbs. The eight possible constructions are illustrated in Table 2:

Manner	他向樓下走 (M) 'He walked downstairs.'
Path	他到(P)了家 'He arrived home.'
Deictic	他來(D)了 'He came.'
Manner+Path	他跑(M)下(P) 三樓 'He ran down to the 3rd floor.'
Manner+Deictic	他往北跑(M)去(D) 'He ran to the north.'
Path+Deictic	他出(P)去(D)了 'He went out.'
Path+Path	他回(P)到(P)家 'He returned home.'
Manner+Path+Deictic	他走(M)過(P)來(D) 'He walked over here.'

Table 2: Eight Possible Constructions of Chinese Motion Verbs

Among the eight combinations by Chen and Guo (2009), Path + Path is a commonly found one, such as *huí-dào* 回到 'return-arrive'. However, their proposal is inadequate in accounting for the contrast between *huí-dào* 回到 'return-arrive' and the reverse order **dào-huí* *到回 'arrive-return', since both are considered Path+Path combinations.

2.4 Sequential Ordering in Mandarin Motion Combinations

Lin (2011) adopted the scale structure proposed in Rappaport Hovav and Levin (2010) in distinguishing scalar morphemes from non-scalar morphemes with her proposal of the Motion Morpheme Hierarchy. Lin (2011) suggested that the motion morphemes have a four-way

classification from the three features defining a scale:

(11) Existence of a scale: whether the motion takes place on a scale or specified some

scalar changes.

    a. Nonscalar motion morphemes: *pǎo* 跑 'run', *fēi* 飛 'fly', *zǒu* 走 'walk'

    b. Scalar motion morphemes: *tuì* 退 'recede', *shēng* 升 'ascend', *huí* 回 'return',

       jìn 進 'enter'

(12) Boundedness: whether a scale has an endpoint.

    a. Open scale morphemes: *tuì* 退 'recede', *shēng* 升 'ascend'

    b. Closed scale morphemes: *huí* 回 'return', *jìn* 進 'enter'

(13) Punctuality: whether the closed scalar motion in instantaneous with only two

points or durative with multiple points.

    a. Multi-point closed scale morphemes: *huí* 回 'return'

    b. Two-point closed scale morphemes: *jìn* 進 'enter'

Figure 2 indicates the four-way classification of Chinese motion morphemes.
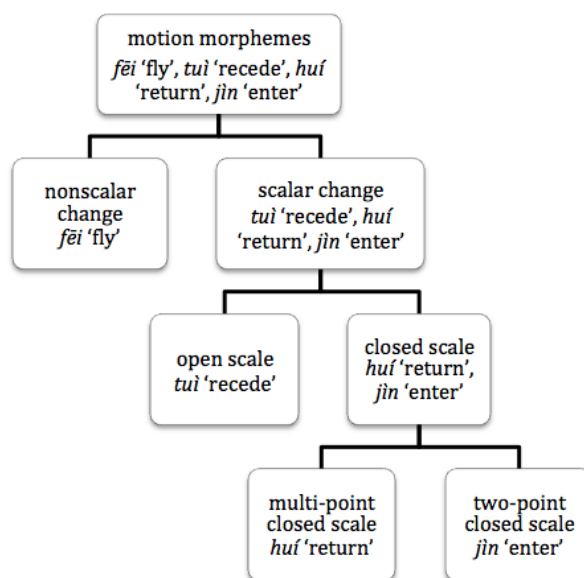
Figure 2: Four-way Classification of Chinese Motion Morphemes

       The hierarchy by Lin (2011) not only distinguishes scalar from non-scalar morphemes

but also predicts the linear order of morphemes in serial motion constructions as indicated in

Figure 3.

Nonscalar change:	Open scale:	Closed scale:
fēi 'fly'	*tuì* 'recede'	**(a) Multi-point closed scale:**
piāo 'float, drift'	*shàng* 'ascend',	*huí* 'return', *lái* 'come'
pǎo 'run'	*xià* 'descend'	*qù* 'go', *guò* 'cross'
zǒu 'walk'	*shēng* 'ascend',	**(b) Two-point closed scale:**
chōng 'rush'	*jiàng* 'descend'	*jìn* 'enter', *chū* 'exit',
etc.	*luò* 'fall',	*guò* 'cross', *dào* 'arrive'
	etc.	
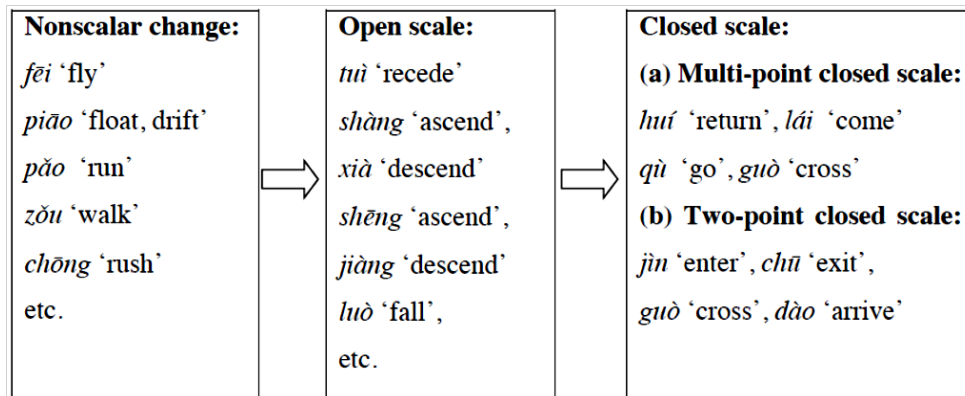
Figure 3: The Motion Morpheme Hierarchy

Lin (2011) claims that semantically compatible motion morphemes in a serial motion construction will be composed in a left-to-right order based on the types in which they belong to the Motion Morpheme hierarchy. For instance, example 8 (page 100) from Lin's proposal illustrates how motion morphemes are ordered according to the hierarchy.

(14) 一枚雪花從空中飄落到地面

　　yì　méi　xuěhuā　cóng kōng-zhōng　piāo-luò-dào　dìmiàn

　　one　CLF snowflake　from sky-inside　drift-fall-arrive　ground

　　'A snowflake drifts and falls on the ground from the sky.'

Nonscalar change *piāo* 'drift'	⇒	Open scale *luò* 'fall'	⇒	(two-point) closed scale *dào* 'arrive'
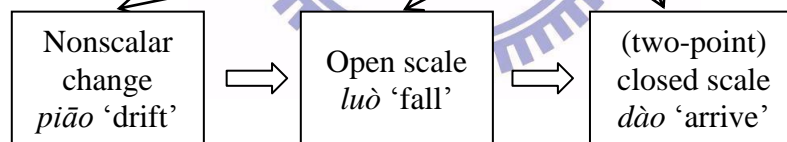
Along the vein, the example below suggests that a closed scale motion morpheme *huí* 'return' is predicted to follow an open scale motion morpheme *tuì* 'recede', but not vice versa.

(15) a.軍隊退回陝西

　　　jūnduì　tuì-huí　Shǎnxī

　　　army　recede-return　Shanxi

　　　'The army receded back to Shaanxi. ' (PKU Corpus)

　　b.*回退陝西

　　　huí-tuì Shǎnxī

　　　return-recede Shanxi　　　　　　　　　(Lin 2011)

14

As suggested from the above examples, the sequence *huí-tuì* *回退 'return-recede' is therefore ruled out since *huí* 回 'return' is a closed scale morpheme while *tuì* 退 'recede' is an open scale morpheme. According to Lin (2011), such a combination in which an open scale morpheme follows a closed scale morpheme is not possible due to the violation of the linear order predicted by the hierarchy.

However, a closer look into corpus data suggests a different story. According to Liu et al. (2012b[2]), sequences that seem not consistent with Lin's Motion Morpheme Hierarchy, such as *huí-tuì* 回退 'return-recede' (vs. *tuì-huí* 退回 'recede-return'), are found quite a lot in Mandarin as exemplified below:

(16) a. 時間如流水，永遠都不會回退。

    shíjiān rú liúshuǐ yǒngyuǎn dōu búhuì huí-tuì

    time as flowing.water forever all never return-recede

    'Time doesn't flow back as water never does.'

    (Google 2012/05/12)

    b. 近視手術後如何防止視力回退？

    jìnshì shǒushù hòu rúhé fángzhǐ shìlì huí-tuì

    myopia.surgery after how avoid vision return-recede

    'How can one avoid vision regression after a myopia surgery?'

    (Google 2012/07/18)

The above examples show that the less permissive combination of *huí-tuì* 回退 'return-recede' by Lin (2011) is found acceptable and permissive in Mandarin. To account for these examples, Liu et al. (2012b) adopted the Diectic-Incorporated Proto-Motion Event Schema to approach the sequential ordering by postulating the iconic sequences reflected by

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[2] Liu et al. (2012b) refers to

Liu, Meichun, Yuwen Chen, Hsiaoyung Ni, Weichin Chang. 2012b. A Study of Semantic-to-Morphological Sequencing of Mandarin Motion Verbs. Paper presented at The 20th Annual Meeting of the International Association of Chinese Linguistics (IACL-20), August 29 - September 2, 2012, the Hong Kong Polytechnic University, Hong Kong.

Mandarin motion verbs. Liu et al. (2012b) hence proposed the following sequential principles to accommodate the above concerns:

I. Boundary Setting Principle

In a given serial verb construction $[V_1…V_n]$, V_1 and V_n take up the leftmost and rightmost delimiter to determine the semantic range in a given serial verb construction with designated semantic components.

With the above principle, Liu et al. (2012b) has indicated how the semantic components in motion verbs mapped into motion sequences to determine their sequential ordering. Take the combination *shàng-sheng* 上升 'go up to rise' for example, V1 *shàng* 上 'go up' will serve as a leftmost delimiter to set up the leftmost boundary starting at the Route component while V2 *sheng* 升 'ascend' is the rightmost delimiter to determine the rightmost boundary ending at the Direction component. Thus, the total semantic range of this combination *shàng-sheng* 上升 'go up to rise' will be composed of the Route and Direction components.

Second, these semantic components encoded in a serial motion construction may follow an iconic representative order to depict motion progression in human minds. Such order may start from Manner to Endpoint from left to right in the Schema. In view of the Schema, verbs encoding some particular components in serial motion constructions should agree in the sequential order which aligns with that of these components plotted in the Schema. For example, motion verb *fēi* 飛 'fly' is said to lexicalize the component Manner and therefore precedes another Path-encoding verb *luò* 落 'fall' in a sequence of *fēi-luò* 飛落 'fly down.' However, another combination **luò-fēi* *落飛 #'fly down'[3] seems less permissive because the Manner-encoding verb *fēi* 飛 'fly' would turn out to be followed by *luò* 落 'fall', which lexicalize Route, Direction, and Endpoint. To respect the iconic sequence depicted in the Schema, such sequence as **luò-fēi* *落飛 #'fly down' is therefore ruled out for disobeying the following principle.

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[3] The free translations marked by "#" suggest the intended meanings of the unacceptable examples.

II. Non-regressional Principle

The sequential ordering of motion verbs need to respect the left-to-right sequence displayed with the key semantic components in the Deictic-Incorporated Proto-Motion Event Schema in a non-regressional fashion.

Besides, Liu et al. (2012b) also indicated the contrast between *jiàng-xià* 降下 'descnd to go down' and *sheng-xià *升下 #'ascend to go down' which results from the semantic compability of these motion verbs encoded. By the Boundary Setting Principle, we know that the sequence of motion verbs will determine the total lexicalized components in a serial motion construction. When this principle is applied to the unacceptable sequence *sheng-xià *升下 #'ascend to go down', it will end up lexicalizing Route, Direction, and Endpoint. However, it is these semantic components encoded in this sequence that play a role to result in its unacceptability. Motion verb *sheng* 升 'ascend' specifies an upward direction while the adjacent one *xià* 下 'go down' suggests a downward movement. Since there is a semantic conflict describing the Direction this motion event choose, such semantic incompatibility of the Direction components result in the impossible composition of *sheng* 升 'ascend' and *xià* 下 'go down.' To capture the above constraint, another guiding principle is therefore proposed to account for the restriction concerning semantic incompability.

III. Semantic Compatibility Principle

Given any two motion verbs V1 and V2 with overlapped semantic components lexicalized in their serial motion construction, such combination may only be permissive when these semantic components are semantically compatible with one another.

In addition, some other impossible sequences are also found in Mandarin such as *pǎo-fēi *跑飛 #'run by flying' and *tiào-pá *跳爬 #'jump by crawling'. As Liu et al. (2012b) suggested, serial motion constructions encoding more than one Manner or Endpoint component may be restricted in their morphological combination. As we may observe that the Manner component describe the particular ways of motion, every motion event will choose one and only one kind of manners to express its unique way of movement. Both *pǎo* 跑 'run'

and *fēi* 飛 'fly' are lexicalizing the Manner component and restricted to co-occur in a serial motion construction to avoid double marking of Manner in motion. Thus the following principle is proposed to accommodate the above concerns.

IV. No Double Manner Principle

A serial motion construction with more than one Manner component is restricted to avoid a redundant double marking of Manner in motion.

Along the vein, some other constraints may also apply to serial motion constructions encoding Endpoint such as **rù-dào/zhì* *入到/至 #'enter to arrive' and **rù-jìn* *入進 #'go in to enter.' Liu et al. (2012b) observed that both of them consist of Endpoint-encoding motion verbs, *rù* 入 'enter' and dào/zhì 到/至 'arrive.' According to Liu et al. (2012b), the Endpoint component projects a locative noun phrase as the destination of a motion event. Given that every motion event will be specified by one and only one destination, the composition of *rù* 入 'enter' and *dào/zhì* 到/至 'arrive' altogether may bring about the redundant marking of Locative NP in motion. Liu et al. (2012b), therefore, came to propose the following principle.

V. Single Endpoint Principle

Motion verbs lexicalizing Endpoint component are restricted to form a combination with one another to avoid double projection of Locative NP in motion events

With the Single Endpoint Principle, Endpoint-encoding verbs are restricted to compose a serial motion construction with one another to avoid the double projection of the Locus NP. Therefore we may rule out such impossible combinations as **rù-dào/zhì* *入到/至 #'enter to arrive' and **rù-jìn* *入進 #'go in to enter.'

2.5 Frame-based Approach to Motion

Professor Charles Fillmore at UC Berkeley has established an English verb lexical database called FrameNet (http://framenet.icsi.berkeley.edu/). It aims to provide a frame-based analysis of English verbs as well as their frame relations among them. According to FrameNet, the motion frame states that 'some entity (Theme) starts out in one place (Source) and ends up in some other place (Goal), having covered some space between the two (Path). Alternatively, the Area or Directionin which the Theme moves or the Distance of the movement may be mentioned.' (Fillmore and Atkins 1992). The core frame elements of motion frame can be illustrated as blew:

(17) Jo   MOVE   past Dad   into the hall.

   [Figure]   **[Path]**   **[GOAL]**

(18) The policeman MOVED away from the door.

                      [Source]
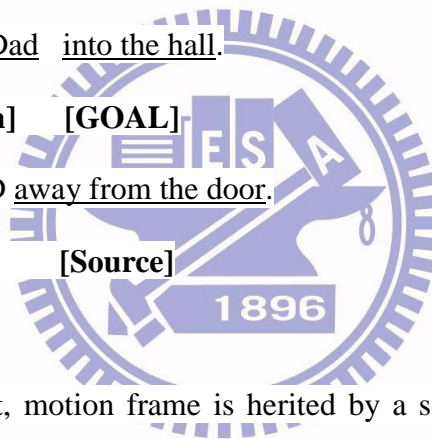
According to FrameNet, motion frame is herited by a set of motion-related motion as show in Figure 4 and summarized in table 3.
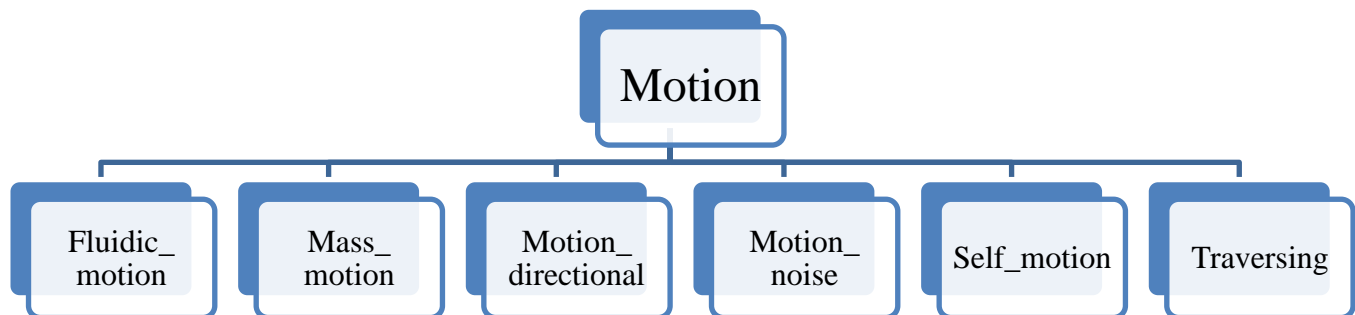
Figure 4: Subframes under Motion Frames in FrameNet

Frame	Definition	Lemmas
Fluidic _motion	In this frame a Fluid moves from a Source to a Goal along a Path or within an Area.	*bubble, cascade, course,* etc
Mass_motion	A Mass_theme, generally made up of many individuals, moves from a Source to a Goal with some Path.	*crowd, flock, flood,* etc.
Motion_ directional	In this frame a Theme moves in acertain Direction which is often determined by gravity or other natural, physical forces. The Theme is not necessarily a self-mover	*angle, descend, dip,* etc.
Motion_noise	This frame pertains to noise verbs used to characterize motion. Motion_noise verbs take largely the same Source, Path and Goal expressions as other types of Motion verbs.	*bang, buzz, chug,* etc.
Self_motion	The Self_mover, a living being, moves under its own direction along a Path. Many of the lexical units in this frame can also describe the motion of vehicles (e.g., as external arguments). We treat these as belonging in this frame. Self_motion most prototypically involves individuals moving under their own power by means of their bodies. Many words also specify the manner of motion (swim, walk). This frame contains mostly words that fit this prototypical scenario, but the frame itself does not specify whether a separate vehicle is impossible, necessary, or unspecified. Lexical units that involve separate vehicles are associated with FEs that are not appropriate for the more general case of motion, so they are placed in the Operate_vehicle or Ride_vehicle frames (e.g., *He drove across the country, She flew to Europe*).	*advance, amble, back, barge, bop, bound, burrow, bustle, canter caper, clamber, climb, clomp, coast,* etc.
Traversing	A Theme changes location with respect to a salient location, which can be expressed by Source, Path, Goal, Area, Direction, Path_shape, or Distance.	*ascend, crisscross, circle,* etc.

Table 3: The Frame Summary of Motion Frame in FrameNet

2.6 Summary

While Talmy (2000) has exhausted the notion of MOTION by illustrating the conceptual salient components across world languages, Chen and Guo (2009) and Lin (2011) have looked into the unique serial motion constructions in Mandarin and attempted to postulate the relative linear order of Mandarin motion morphemes. Fillmore and Atkin (1992) adopting Frame Semantics have also investigated the lexical meanings of English verb classes in FrameNet. Though the above studies have looked into verbs of motion in Mandarin and their sequential relation in serial motion constructions, few of them have paid attention to the unique behavior of prevailing sequential alternation in serial motion constructions with a corpus-based investigation. The present studies aim to explore the alternated motion sequences in Mandarin with a close look into the distributional patterns and collocational associations to account for the compositional mechanism underlying the sequential alternation.
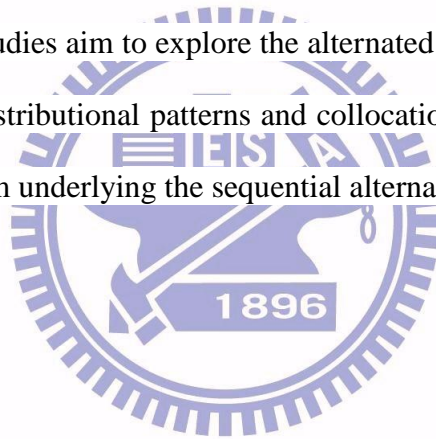
Chapter 3

Database, Theoretical Frameworks and Methodology

3.1 Database

The Data collected and analyzed in the present study is mainly based on the corpus data from Academia Sinica Balanced Corpus of Modern Mandarin Chinese (SinicaCorpus) (http://dbo.sinica.edu.tw/SinicaCorpus/index.html). Another database we consult is the Chinese Word Sketch (http://wordsketch.ling.sinica.edu.tw/). It provides abundant data in contribution to exhibit the distributional frequency and collocational patterns of each Mandarin sequence. Besides, the daily-updated search engine "Google Search" (http://www.google.com.tw/), is the third database used as supplementary resources to verify detailed collocational associations. In addition to the three corpora as the main databases, some other resources are also considered such as the FrameNet (http://framenet.icsi.berkeley.edu/) and the Mandarin Verbnet (http://140.113.222.78/verbnet/website/).

3.2 Theoretical Frameworks

The Deictic-Incorporated Proto-Motion Event Schema (Liu et al. 2012a) is adopted as a basis of establishing a well-motivated account for sequential alternation. By utilizing the iconic sequencing of motion demonstrated by the Schema, we aim to provide a systematic analysis of a form-to-function correlation as realized in different orders of motion combinations in these eleven pairs of alternated motion sequences.

3.2.1 The Deictic-Incorporated Proto-Motion Event Schema

The study adopts the Deictic-Incorporated Proto-Motion Event Schema (PMS) by Liu et al. (2012a) as a cognitive basis in identifying the semantic components in a given motion event in Mandarin. According to Liu et al. (2012a), several semantic salient components in Mandarin motion events are identified and plotted into an iconic representation that observes the natural progression of motion events. This schema is adopted as a framework and basis to capture the sequential relationship of motion verbs in Mandarin serial motion constructions.
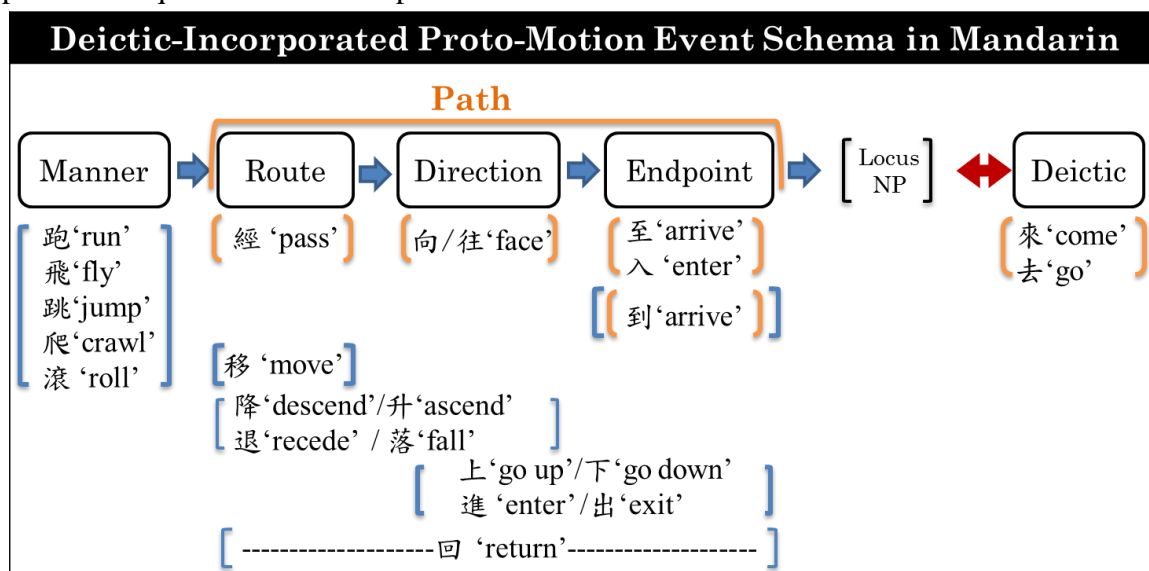
Figure 5: The Deictic-Incorporated Proto-Motion Event Schema in Mandarin
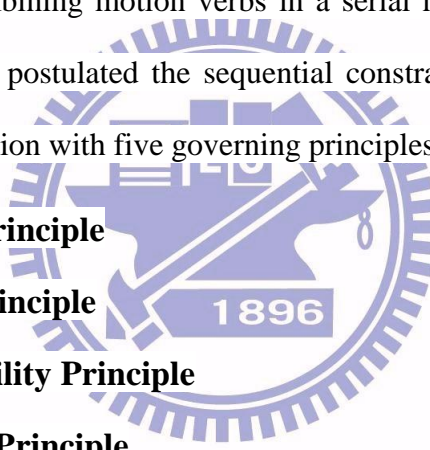
From Figure 5, those essential semantic components, Manner, Route, Direction, Endpoint, and Deictic are identified in the Deictic-Incorporated Proto-Motion Event Schema in Mandarin. With this schema, Mandarin motion verbs may be categorized based on the sub-categories or portions by the different lexicalization pattern chosen by each of the Mandarin motion verbs.

According to Liu et al. (2012a), the schema also reveals an iconic representation of motion progression of Mandarin motion events, a multi-morpheme verb combination needs to observe the left-to-right linear sequence: from Manner to Route to Direction to Endpoint.

Verbs may lexicalize one or more of the semantic components in the sequence. For example, in *qiú gǔn-luò-jìn-dào dònglǐ* 球滾落進到洞裡 'The ball rolled and fell down into the hole', the leftmost verb V1 *gǔn* 滾 'roll' is said to encode Manner; V2 *luò* 落 'fall' encodes both Route and Direction; V3 *jìn* 進 'enter' lexicalized Direction and Endpoint, and V4 in the rightmost position specifies an Endpoint.

According to Liu et al. (2012a), the Deictic-Incorporated Proto-Motion Event Schema identified these crucial semantic components of a motion event and linearized these components in agreement with the iconic sequencing of motion progression. Moreover, verbs of motion encoding different components in the Schema may follow the linear order of encoded components in combining motion verbs in a serial motion construction. Along the vien, Liu et al. (2012b) has postulated the sequential constraints that regualte the ordering relations among verbs of motion with five governing principles as follows:

I. Boundary Setting Principle

II. Non-regressional Principle

III. Semantic Compatibility Principle

IV. No Double Manner Principle

V. Single Endpoint Principle

To account for the concerns of this study, we will mainly consider the first principle to exhibit how these essential semantic components in verbs of motion are incorporated into various motion sequences. According to the Boundaring Setting Principle by Liu et al. (2012b), 'in a given serial verb construction [V1…Vn], V1 and Vn take up the leftmost and rightmost delimiter to determine the semantic range in a given serial verb construction with designated semantic components.' For examples, *huí-tuì* 回退 'return to recede' have V1 *huí* 回 'return' setting up the leftmost boundary at Route and V2 *tuì* 退 'recede' delimiting the rightmost boundary at Direction as illustrated below:
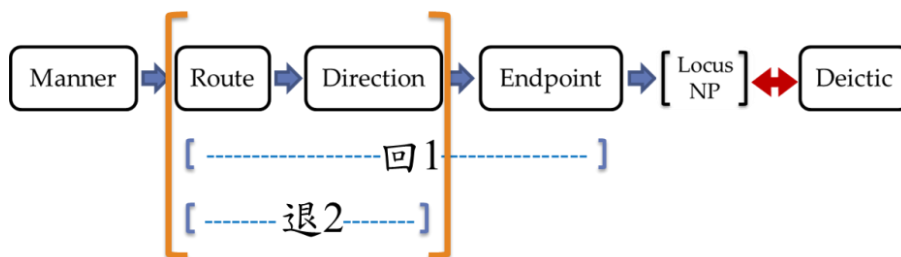
Figure 6: Semantic Range of Motion Sequence 回退

The semantic range indicated by the orange brackets specifies the semantic range of motion sequence *huí-tuì* 回退 'return to recede' from Route to Direction. With this principle, we may be able to postulate the semantic integration of essential components in the alternated motion sequences.

3.2.2 Frame Semantics

The study adopts Frame Semantics as the theoretical framework to capture the verb-external and verb-external interrelation of motion sequences. Developed by Fillmore and Atkins (1992), one of the most profoundly credited assumptions is that '…a word's meaning can be under stood only with reference to a structured background of experience, beliefs, or practices, constituting a kind of conceptual prerequisite for understanding the meanings.' Following their assumption, '…word or word senses are not related to each other directly, but only by way of their links to common background frames and indication of manner in which their meanings highlight particular elements of such frames' (Fillmore and Atkins 1992: 76-77). The cognitive framework to word senses by Fillmore and Atkins (1992) suggests that a word evokes or activates semantic frame in which the word meaning is defined altogether with several core frame elements. A semantic frame owns a set of core frame elements. Lexical meanings are indicated by different frames where specific frame elements are profied. Furthermore, the highlighted frame elements may constribute to unique syntactic behaviors.

By investigating the syntactic-to-semantic interrelation, the lexical meanings of verbs can be recognized.

3.2.3 Mandarin VerbNet

Following the assumption that meanings of verbs can only be defined in semantic frame bu profiled lexical elements (Fillmore and Atkins 1992, Goldberg 2005), Mandarin motion sequences are analyzed and categorized by a frame-based hierarchical taxonomy, by Liu and Chiang (2008) with a multi-layered structured classification of semantic frames: Archiframe > Primary frame > Basic frame > Microframe. Frames in the higher level denote a broader scope of certain semantic domain with background informain. Frames in the lower level inherit from upper frames and provide frame-specific description.

According to Liu and Chiang (2008), **the Archiframe (AF)** constructs a maximal scope of certain semantic domain in which relevant background information for one unique event is included. The archiframe provides an overarching conceptual schema with a set of default participant roles (aslo known as frame elements). **Primary frames (PFs)** are more specific frames in which a given portion from the Archiframe is profiled. Each primary frame is distinctive with unique profiled elements (core frame elements). **Basic frames (BFs)** are defined by a highlighted participant roles or particular relation within primary frames. By observed syntactic patterns that foreground or backgrouned certain participants can each basic frame be clearly distinguished. **Microframes (MFs)** are lowest level in the multi-layered structure that is defined by verb-internal lexical features. Under the frame-based hierarchical taxonomy, each frame is identified with a definition, a set of frame elements, defining patterns, conceptual schema, and representative lemmas.

3.3 Methodology

      To provide a systematic account for these alternated motion sequences and their unique behaviors of semantic predication to spatial and non-spatial events. The following steps are constructed.

Step 1: Consider verbs of motion in the Schema and make a list of all possible bi-morphemic motion combinations

      First of all, we set up a scope by overlooking all these motion verbs and try to exhaust the possible bi-morphemic combinations from these verbs of motion.

Step 2: Narrow down all the motion sequences into a set of alternated motion sequences

      We take a look into all the possible bi-morphemic combinations and test if these motion combinations are allowed for sequential alternation. For example, motion verb *fēi* 飛 'fly' can only precede *luò* 落 'fall' in a non-regressional fashion while *jiàng* 降 'fall' may either precede or follow *luò* 落 'fall' displaying the alternating flexibility of combining each other. Along the vein, we set up eleven pairs of alternated motion sequences by teasing out these non-alternated motion combinations.

Step 3: Collecting the corpus data

Sinica Corpus, Chinese Word Sketch Engine, and Google Search are consulted to collect corpus data of the alternated motion sequences

Step 4: Data Observation and Investigation

Every pair of alternated motion sequences are mainly under inspection of their 1) distributional frequency, 2) collocational patterns, and 3) semantic distinctions, and 4) morphological mapping with event types of alternated motion sequences.

Step 5: Analyzing these alternated alternated motion sequences

The corpus-based observations are utilized to account for the alternated motion sequences on their 1) the distributional frequency, 2) the syntactic-to-semantic correlation and 3) the alternating sequential mechanism. Lastly we will incorporate the motion sequences into the frame-based taxonomy.

Chapter 4

Findings

In chapter 4, how verbs of motion interact with each other in an alternated compositional mechanism has provided various combinations of motion sequences. A closer look into corpus data suggests that verbs of motion are permitted for sequential alternation. For example, given any two motion verbs *jiàng* 降 'land' and *luò* 落 'fall', they can be linearized in a sequence as *jiàng-luò* 降落 'land-fall' or the reversed sequence *luò-jiàng* 落降 'fall-land.' In respond to the alternated nation of motion seuqneces, we will describe the correlation of syntactic realizations and semantic components encoded via a close inspection on their 1) distributional frequency, 2) collo-constructional patterns, 3) semantic distinction, and 4) sequential correlation with semantic features. Section 4.1 will provide a corpus-survey comparison on their distributional frequency of every pair of alternated motion sequences. Section 4.2 presents collocational associations of motion sequences with their participant roles. Section 4.3 presents spatial and various non-spatial usages of motion sequences. Section 4.4 exhibits the semantic distinction realized in alternated motion sequences in their event types of spatial and mon-spatial motion events

4.1 Distributional Frequency of Alternated Motion Sequences

As shown in the previous chapters, Mandarin motion sequences can be composed in the alternated order. First of all, we start from Chinese Word Sketch Engine to see some alternated pairs of motion sequences as shown below:

(19) a. *jiàng-luò* 降落 'fall to descend'   vs.   *luò-jiàng* 落降 'fall to descend'

     b. *jiàng-xià* 降下 'fall to go down'   vs.   *xià-jiàng* 下降 'go down to descend'

     c. *shēng-shàng* 升上 'asecnd to go up'   vs.   *shàng-shēng* 上升 'go up to ascend'

In addition to Chinese Word Sketch Engine as a rather closed and built-in corpus, we also consider the daily-updated corpus Google Search. It turns out that a large number of alternated motion sequences are observed as indicated below:

(20) a. *luò-xià* 落下 'fall to go down'   vs.   *xià-luò* 下落 'go down to fall'

 b. *tuì-luò* 退落 'recede to fall'   vs.   *luò-tuì* 落下 'fall to go down'

 c. *tuì-xià* 退下 'recede to go down'   vs.   *xià-tuì* 下退 'go down to recede'

 d. *tuì-huí* 退回 'recede to return'   *vs.*   *huí-tuì* 回退 'return to recede'

 e. *jiàng-huí* 降回 'descend to return'   vs.   *huí-jiàng* 回降 'return to descend'

 f. *shēng-huí* 升回 'ascend to return'   vs.   *huí-shēng* 回升 'return to ascend'

 g. *luò-huí* 落回 'fall to return'   vs.   *huí-luò* 回落 'return to fall'

Given that the alternated motion sequences are observed, we may wonder how those motion sequences are distributed in the corpus. Are both sequences equally found? Or is there predominant sequence over another in constructing verbs of motion into motion sequences? An investigation into the corpus has revealed the distributional frequency as shown below.

	Group (a)		Group (b)	
1	a.降落	99.36% (1400/1409)	b.落降	0.63% (9/1409)
2	a.落下	95.9% (281/293)	b.下落[4]	4.09% (12/293)
3	a.退落	89.55% (60/67)	b.落退	10.44% (7/67)
4	a.退下	96.55% (308/319)	b.下退	3.44% (11/319)
5	a.退回	98.07% (407/415)	b.回退	1.92% (8/415)
6	a.降下	3.35% (3320/98999)	b.下降	96.64% (95679/98999)
7	a.升上	1.16% (920/78955)	b.上升	98.83% (78035/78955)
8	a.升回	1.22% (35/2855)	b.回升	98.77% (2820/2855)
9	a.降回	10.52% (40/380)	b.回降	89.47% (340/380)
10	a.落回	1.06% (51/4787)	b.回落	98.93% (4736/4787)

Table 4: Distributional Frequency of Alternated Motion Sequences

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[4] Only the verbal use of motion sequence 下落 is included. The nominal use is 下落 is excluded.

Table 4 suggests that a distributional skewing to a predominant sequence is observed from both ways of linearizing verbs of motion. In some pairs of alternated motion sequences, for example, motion sequence *jiàng-luò* 降落 'descend to fall' from Group (a) wins over their reversed counterparts *luò-jiàng* 落降 'fall to descend' from in their distributional frequency. On the other hands, another predominant pattern is observed from some alternated pairs. For example, motion sequences from Group (b) as *huí-luò* 回落 'return to fall' show higher distributional frequency than their counterparts from Group (a) as *luò-huí* 落回 'fall to return.'

In short, since motion sequences can be alternatively ordered in either way as in Group (a) and Group (b), two of predominant patterns in linearizing verbs of motion have been preferred by a certain group of motion sequences. In the following sections we will account for how verbs of motion decided on the predominant sequences in constructing motion sequences to reveal the semantic distinctions in reporting a motion event.
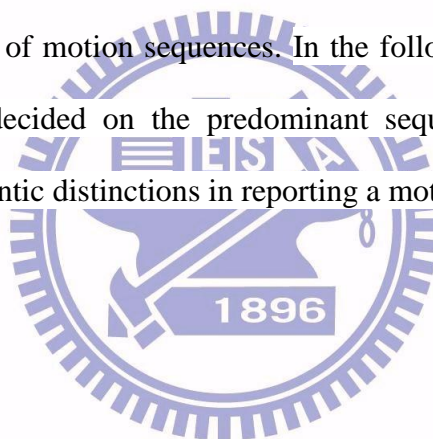
4.2 Collocational Patterns

As noted by Talmy (2000), the concept of MOTION consists of internal elements Figure, Ground, Move, and Path and external co-event components. The concept of Co-event can be understood as Manner or Cause conflated with Move into verbs of motion as illustrated by Figure 1:
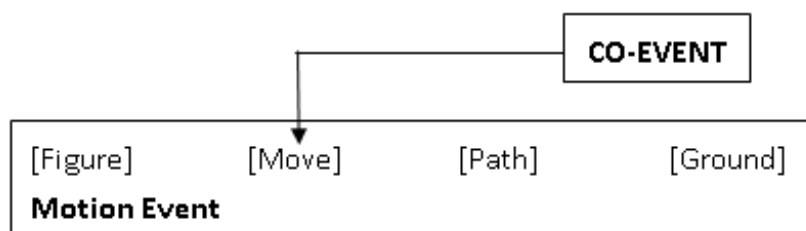
Figure 1: The Concept of Motion by Talmy (2000)

Reviewing Talmy's cognitive schema of motion, Liu et al. (2012a) have decomposed the general concept of PATH into three subcategories: Route, Direction, and Endpoint. Route component describes the motion contour while Direction component complements the directional information of the movement. Endpoint component serves to anchor a final destination of the motion, also known as Locative NP as indicated in the Deictic-Incorporated Proto-Motion Event Schema.

Adopting the PMS that integrates the verb-internal and verb-external approaches to motion, we hereby probe into these alternated motion sequences by describing the semantic components encoded and co-occurring role participants. For example, Route and Direction components are lexicalized verb-internally in motion verbs, 降 *jiàng* 'descend' and 落 *luò* 'fall.' On the other hand, a verb-external investigation examines the various collocation of alternated motion sequences with essential external role participants.

We aim to reveal the interrelation between the syntactic behaviors and semantic properties of alternated motion sequences via a close inspection on collocational patterns. The following sections will present the corpus observation on their collocation with some verb-external participant roles as well as the unique aspectual markers in Mandarin Chinese. By the thorough investigation, we aim to present the collo-constructional variations between pairs of alternated motion Mandarin sequences.

4.2.1 Collocational Patterns

As suggested by Liu et al. (2012a), a motion event can be defined that a conceptually moving entity (Figure) moves by adopting a particular way of movement (Manner) on a stationary site (Ground) or a certain course of motional path, passing an intermediate

landmark (Route NP) toward a spatial orientation (Directional NP) to arrive at a final destination (Locative NP) in relation to an optional marking of speaker-oriented center (Deictic).

In this section, we will investigate how these essential elements are surfaced in the collocational patterns with alternated motion sequences. We will present motion sequences from both groups and their re-ocurring syntactic patterns with 1) various NP complements or adjuncts, 2) various VPs, and 3) deictic verbal complements.

1) Collocation with NP complements

Motion sequences may take a NP complement to specify the moving entity as depicted in the following pattern.

1. Figure < ＊

(21) [泰國洪水/Figure]稍**退下**。

　　tàiguó　　hóngshuǐ shāo　　tuì-xià

　　Thailand　　flood　　slightly　　fall-go.down

　　'The floodwaters across Thailand has slightly receded'

　　(Google 2012/11/06)

(22) [個人電腦銷售量/Figure]節節**下退**。

　　gerén　diànnǎo xiāoshòuliàng　　jiéjié　　　xià-tuì

　　personal　computer sales　　　　little.by.little　go.down-recede

　　'The sales of PCs have declined gradually.'

　　(Google 2012/11/06)

As we know motion sequences may take a NP complement to specify the moving entity, some motion sequences from Group (a) are prone to take another NP complement such as *dìmiàn* 地面 'ground' specifying the final destination of motion contour as shown in the

following pattern.

2. **Figure < ＊ < Locative NP**

(23) [吉祥樹/Figure]又緩緩**降回**[地面/Locative NP]。

jíxiángshù   yòu   huǎnhuǎn   jiàng-huí   dìmiàn

The.Fortune.Tree   again   slowly   land-return   ground

'The Fortune Tree fell back to the ground slowly.'

(Google 2012/12/27)

(24) [十五的月亮/Figure]**升上**了[天空/Locative NP]。

shíwǔ   de   yuèliàng   sheng-shàng   le   tiānkōng

fifteen   de   moon   ascend-go.up   ASP   sky

'The moon has risen up to the sky.'

(Google 2013/06/07)

As shown by above examples, we may kwow motion sequences *jiàng-huí* 降回 'descend to return' and *shēng-shàng* 生上 'ascend to go up' from Group (a) may partially take a Locative NP complement to illustrate where the Figure ends at the motional path. Besides the postverbal position, Locative NP can be fronted to the initial position with motion sequences from Group (a) as shown below:

3. **Locative NP < ＊ < Figure**

(25) [黃山風景區/Locative NP]**降下**了[入冬以來第一場大雪/Figure]。

huángshān   fēngjǐng qū   jiàng-xià   le   rù   dōng

Mountain Huang   scenery spot descend-go.down ASP enter winter

yǐlái   dìyī   chǎng   dà   xuě

since   first   time   heavy   snow

'Here comes the very first snow of this winter in Huang Mountain.'

(Google 2012/12/07)

(26) [山壁/Locative NP]落下大量[土石/Figure]，

     shān   *bì*   *luò-xià*   *dà*   *liàng*   *tǔshí*

     mountain   cliff   fall-go.down   great   amount   rock

     'Lots of rocks and mud slide down the hill.'

     (Google 2012/12/07)

As we kwow motion sequences from Group (a) may involve a Locative NP, motion sequences from Group (b), on the other hand, are observed to collocate with some scale NPs indicating the extent of motion as in the following patterns.

4.   Figure < ＊ < Extent of Motion

(27) a. [十五的月亮/Figure]升上了[天空/Locative NP]。

     shíwǔ de   *yuèliàng*   *sheng-shàng*   *le*   *tiānkōng*

     fifteen de   moon   ascend-go.up   ASP sky

     'The moon has risen up to the sky.'

     (Google 2013/06/07)

   b. [死亡率/Figure]上升了不只[十倍/Extent of Motion]。

     sǐwáng   *lǜ*   *shàng-shēng*   *le*   *bùzhǐ*   *shí*   *bèi*

     death rate   go.up-ascend   ASP more   Num   time

     The mortality rate has risen by more than time times

     (Google 2013/06/07)

(28) a. 有毒氣體卻正每天落回[地面/Locative NP]，

     yǒudú   *qìtǐ*   *què zhèng*   *měitiān*   *luò-huí*   *dìmiàn*

     poisonous   air   Adv Pros   every.day   fall-return   ground

     'The poisonous air falls to the ground every day.'

     (Google 2012/11/06)

b. [墨原油出口價格/Figure]每桶**回落**了[２美元/Extent of Motion]。

mò   yuányóu chūkǒu jiàgéměi tong   huí-luò   le   2

Mexican oil   export priceeach bucket recede-fall ASP Num

měiyuán

US.dollar

'The price of exported oil from Mexico has dropped by two dollars.

(Google 2013/01/07)

2) Collocation with Endpoint Marking verb

Endpoint marking verb *dào* 到 'arrive' according to Liu et al. (2013) requires an obligatory marking of Locative NPs without any intervening elements. It may freely collocate with various motion sequences.

5. **Figure <＊< {到} < Locative NP**

(29) [小球/Figure]**落回**到[地面/Locative NP]，

xiǎo   qiú   luò-huí   dào   dìmiàn

small   ball   fall-return arrive   ground

'The ball fell to the ground.'

(Google 2013/06/14)

(30) [週末最高氣溫/Figure]**回落**到[30℃以下/Locative NP]

zhōumò zuì gāo qìwēn   huí-luò   dào 30℃   yǐxià

weekend most high temperature return-fall arrive 30.degrees below

'The highest temperature of this weekend will be lowered than 30 degrees.'

(Google 2013/06/15)

3) Collocation with Deictic of Motion

Deictic of Motion serves to specify how the motion event moves in relation to the speaker as 'toward' *lái* 來 'come' or 'away from' *qù* 去 'go.' It is usually surfaced in postverbal position or precedes Locative NPs. Motion sequences from Group (a) are highly associated with Deictic of Motion while their reversed counterparts from Group (b) are not.

6. Figure <＊< Deictic

(31) a. [氣球/Figure]升上[去/Deictic]！

      qìqiú   *sheng-shàng*   *qù*

      balloon   ascend-go.up   go

      'The balloon soars up.'

      (Google 2013/06/07)

    b. ?[氣球/Figure]上升[去/Deictic]！

(32) a. [腰上的淤青/Figure]退下[去/Deictic]一點，

    yāoshàng   *de*   *yūqīng*   *tuì-xià*   *qù*   *yìdiǎn*

    waist   de   bruise   recede-go.down   go   little

    'The bruise around my waist has reduced a little bit.'

    (Google 2012/06/09)

    b. ?腰上的淤青下退[去/Deictic]一點，

7. Figure <＊< Deictic < Locative NP

(33) a. 如果[你們/Figure]不願保健康險就請退回[去/Deictic][聖彼得堡/Locative NP]

    rúguǒ nǐmén   *bú*   *yuàn*   *bǎo*   *jiànkāngxiǎn*   *jiù*   *qǐn*   *tuì-huí*   *qù*

    if   you   Neg   willing   buy   health.insurance   jiu   please   recede-return   go

    shengpīdebǎo

    Saint-Petersburg

'Please return to Saint-Petersburg if you're not willing to pay the heath insurance.'

(Google 2013/06/01)

b.?如果[你們/Figure]不願保健康險就請**回退**[去/Deictic][聖彼得堡/Locative NP]

4) Collocation with Manner-of-motion verbs

Manner-of-motion verbs such as *fēi* 飛 'fly', *pǎo* 跑 'run', and *zǒu* 走 'walk' denote the particular way of movement. We have observed that motion sequences from Group (a) tend to collocate with them while motion sequences from Group (b) are restricted to co-ocurr with them.

8. Figure < Manner < ＊ < Deictic

(34) a. [小百靈鳥/Figure]開心極了，連忙[飛/Manner]**落下**[去/Deictic]，

xiǎo	*báilingniǎo*	*kāixīn*	*jíle*	*liánmáng*	*fēi*	*luò-xià*	*qù*
Little	skylark	happy	extreme	hurry	fly	fall-go.down	qu

'The little skylarks can't wait to fly down joyfully.'

(Google 2013/06/12)

b. ?[小百靈鳥/Figure]開心極了，連忙[飛/Manner]**下落**[去/Deictic]，

(35) a. [細雨/Figure]又開始[飄/Manner]**降下**[來/Deictic]。

xìyǔ	*yòu*	*kāishǐ*	*piāo*	*jiàngxià*	*lái*
drizzle	again	begin	drift	fall-do.down	lai

'It starts drizzling once again.'

(Google 2013/06/16)

b. ?[細雨/Figure]又開始[飄/Manner]**下降**[來/Deictic]。

9. Figure < Manner VP < ＊ < {到} < Locative NP

(36) a. [兩枚/Figure][飛/Manner VP]**降落**到[其外圍/Locative NP]。

| | *liăng* | *méi* | *fēi* | *jiàng-luò* | | *dào* | *qí* | *wài* | *wéi* |
| | Num | CL | fly | descend-fall | | arrive | its | outer | area |

'Two of them flew down to reach its outskirt.'

(Google 2013/06/01)

b. ?[兩枚/Figure][飛/Manner **VP**]落降到[其外圍/Locative NP]。

(37) a. [古鵬/figure][飛/Manner]退回到[床上/Locative NP]，

gŭpéng *fēi* *tuì-huí* *dào* *chuáng* *shàng*

Gu-peng fly recede-return arrive bed top

'Gu-peng flew back to bed.'

(Google 2013/06/16)

b. ?古鵬[飛/Manner]回退到床上，

The corpus-based observation on collocational patterns reveals that motion sequences in Group (a) are more flexible in co-ocurring with the essential participants while motion sequences from Group (b) is quite restricted as shown in Table 5:

Motion Sequences / Re-ocurring Patterns	Group (a)	Group (b)
1. Figure < ＊	✔（退下）	✔（下退）
2. Figure < ＊ < Locative NP	✔（降回）	✘
3. Locative NP < ＊ < Figure	✔（降下）	✘
4. Figure < ＊ < Extent	✘	✔（上升）
5. Figure < ＊ < {到} < Locative NP	✔（落回）	✔（回落）
6. Figure < ＊ < Deictic	✔（升上）	✘
7. Figure < ＊ < Deictic < Locative NP	✔（退回）	✘
8. Figure < Manner < ＊ < Deictic	✔（落下）	✘
9. Figure < Manner < ＊ < {到} < Locative NP	✔（降落）	✘

Table 5: Reocurring Patterns and Alternated Motion Sequences

4.2.2 Collocation with Aspectual Markers

Motion sequences as a combination of verbs of motion, are commonly found to be specified by many Mandarin aspectual markers to signify the aspectual information. Among the three aspectual markers in Mandarin, *le* 了 is the commonly used one to indicate an event being viewed as a whole (Li and Thopmson 2007). Many of motion sequences are highly associated with aspectual marker *le* 了 while some of them are restricted to co-occur with them.

(38) a. 死亡率上升了不只十倍。

   sǐwáng lǜ shàng-shēng le bùzhǐ shí bèi

   death rate go.up-ascend ASP more Num time

   The mortality rate has risen by more than time times

   (2013/06/07)

  b. *十五的月亮升上了[天空]。

(39) a. 後來原物料的價格稍微回降了一些

   hòulái yuánwùliào de jiàge shāowéi huí-jiàng le yì xiē

   afterwards ingredient de price slightly return-descend ASP Num bit

   'The price of ingredients goes through a slight decline.'

   (Google 2013/06/06)

  b. ?全部電梯由高層緩緩降回了[地面]，

(40) a. 墨原油出口價格每桶回落了 2 美元，

   mò   yuányóu chūkǒu jiàgéměi tong huí-luò le 2

   Mexican oil export price each bucket recede-fall ASP Num

   měiyuán

US.dollar

'The price of exported oil from Mexico has dropped by two dollars.

(Google 2013/01/07)

b. ?它們伴隨著雨水落回了[地面]，

It is observed that motion sequences in example (39a) may collocate with aspectual marker *le* 了 while its reversed counterparts is not able to collocate with *le* 了 without a Locative NP *dìmiàn* 地面 'Ground' as in (39b). The collocational compatibility with aspectual marker *le* 了 also apply in *huí-jiàng* 回降 'return to descend' and *huí-luò* 回落 'return to fall' while their reversed counterparts *jiàng-huí* 降回 'descend to return' and *luò-huí* 落回 'fall to return' are quite restricted to collocate with *le* 了. Based on the observation, we have found that most motion sequences from Group (a) is not able to collocate with aspectual marker *le* 了 without a Locative NP while motion sequences from Group (b) may be specified by *le* 了 as a whole event. In addition to *le* 了, another aspectual marker *zhe* 著 may also collocate with motion sequences to indicate a durative state of motion. Many of motion sequences are highly associated with aspectual marker *zhe* 著 while some of them are restricted with it.

(41) a. 價格卻一直在緩慢地上升著。

jiàgé què   yìzhí   zài huǎnmàn de shàng-shēng zhe

price instead always zai slowly   Adv go.up-ascend zhe

'The price has been rising all the time in a slow pace.'

(Google 2013/06/16)

b. ?十五的月亮升上著天空。

(42) a. 身體的溫度則是在不斷的下降著。

shēntǐ de wēndù   zéshì zài búduàn de xià-jiàng   zhe

body Pos temperature instead zai continuous Adv go.down-descend zhe

'The body temperature has been continued to decline.'

(Google 2013/06/16)

b. ?黃山風景區降下著入冬以來第一場大雪。

In short, we have summarized the collocational variations of alternated motion sequences with aspectual marker *le* 了 and *zhe* 著 in the following table.

Motion Sequences		Aspectual Markers	
		le	*zhe*
Group (a)	落下, 退下, 降下, 升上, 降落 落回, 退回, 升回, 降回, 退落	✔ （Locative NP Preferred)	✘
Group (b)	下落, 下退, 下降, 上升, 落降 回落, 回退, 回升, 回降, 落退	✔	✔

Table 6: Collocational Patterns with Aspectual Markers

4.3 Semantic Distinction: Spatial and Non-spatial Motion Events

As we know that motion can be realized to a variety of physical or spatial movements which constitute the basic motion events of human lives, it is also found that motion events can be metaphorically extended to non-spatial relations. Both of them are crucial to our comprehension of motion events. Take the motion sequence *tuì-xià* 退下 'fall to go down' for example, this motion sequence may predicate both physical movement and metaphorically non-spatial movement as exemplified below:

(43) a. 泰國洪水稍退下。

        tàiguó   *hóngshuǐ shāo*   *tuì-xià*

        Thailand   flood   slightly   fall-go.down

        'The floodwaters across Thailand has slightly receded'

        (Google 2012/11/06)

    b. 個人電腦銷售量節節下退。

        gerén   *diànnǎo xiāoshòuliàng*   *jiéjié*   *xià-tuì*

        personal   computer sales   little.by.little   go.down-recede

        'The sales of PCs have declined gradually.'

        (Google 2012/11/06)

From the above example, we see that motion sequence *tuì-xià* 退下 'recede to go down' describes the physical motion of receding by the visually observable Figure *hóngshu* 洪水 'flood.' On the other hand, its reversed counterparts *xià-tuì* 下退 'go down to recede'in (43b) illustrates a non-spatial movement in which the non-observable Figure *xiāoshòu.liàng* 銷售量 'sales' demonstrates the economic recession. Along the vein, the semantic distinction is also confirmed by motion sequence *luò-huí* 落回 'fall to return' and *huí-luò* 回落 'return to fall' in example (44).

(44) a. 有毒氣體卻正每天落回地面，

        yǒudú   *qǐtǐ*   *què zhèng*   *měitiān luò-huí*   *dìmiàn*

        poisonous   air   Adv Pros   every.day fall-return   ground

        'The poisonous air falls to the ground every day.'

        (Google 2012/11/06)

    b. 市場糧價回落，

        shìchǎng liàng   *jià*   *huí-luò*

        market   provisions   price   return-fall

'The price of provisions has fallen.'

(Google 2012/11/06)

Motion sequence *luò-huí* 落回 'fall to return' denotes a physically observable spatial movement with a observable moving entity *yǒudú.qǐtǐ* 有毒氣體 'poisonous air.' However, the reversed counterpart *huí-luò* 回落 'return to fall' illustrates another non-spatial motion event with a non-observable moving entity *liàngjià* 糧價 'the price of provisions.'

Based on the observations on semantic features of various participant roles collocating with alternated motion sequences, we come to suggest that motion sequences such as *luò-huí* 落回 'fall to return' and *tuì-xià* 退下 'recede to go down' from Group (a) are highly associated with conceptually concrete Figure NPs such as *yǒudú.qǐtǐ* 有毒氣體 'poisonous air.' On the other hand, their reversed counterparts *huí-luò* 回落 'return to fall' and *xià-tuì* 下退 'go down to recede' from Group (b) tend to collocate with cognitively abstract moving entities such as *liàngjià* 糧價 'the price of provisions.' As we have described from the above examples, a variety of non-visually observable events can be comprehended in terms of motion with metaphoric extension to non-spatial movements. A close examination of the corpus suggests a variety of non-spatial usages of motion events. We have postulated some predominantly occurring cases of non-spatial motion events that are 1) movement of economic development, 2) movement of time, 3) movement of trend, and 4) movement of mental activities.

4.3.1 Movement of Economic Development

Among the four types of events, the re-occurring non-spatial motion events are those depicting economic development in terms of motion as described blew:

(45) 九月製造業景氣回降。

    jiǔyuè   *zhìzàoyè*   *jǐngqì*   *huí-jiàng*

    September   manufacturing.business   prosperity   return-fall

    'The prosperity of manufacturing business fell back to the previous level.'
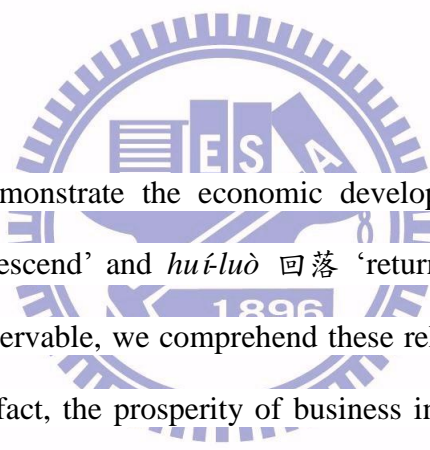
    (Google 2012/12/27)

(46) 市場糧價回落，

    shìchǎng   *liàng*   *jià*   *huí-luò*

    market   provisions   price   return-fall

    'The price of provisions has declined.'

    (Google 2012/11/06)

The above examples demonstrate the economic development with motion sequences *huí-jiàng* 回降 'return to descend' and *huí-luò* 回落 'return to fall.' Since the economic growth or decline is non-observable, we comprehend these relatively non-physical events by the metaphor of motion. In fact, the prosperity of business in example (45) is realized as a moving entity that takes an action of *huí-jiàng* 回降 'return to descend.' In short, the economic development is often metaphorically understood as a non-spatial motion event in which economically relevant participants such as *jǐng.qì* 景氣 'prosperity' or *liàng.jià* 糧價 'price of provisions' play the role of moving entities demonstrating a motion progression to depict the economic development.

4.3.2 Movement of Time

In addition to non-spatial movement describing economic developments, the shift of temporal events is often realized as non-spatial motion events as noted in the following

examples.

(47) 時間如流水，永遠都不會回退。

shíjiān rú liúshuǐ   yǒngyuǎn dōu búhuì   huí-tuì

time   as flowing.water forever   all never   return-recede

'Time doesn't flow back as water never does.'

(Google 2012/05/12)

(48) 夢中回退到嬰兒期。

mèngzhōng huí-tuì   dào   yīngér   qí

in.the.dream return-recede arrive   infant   period

'(Someone) has mentally returned to the infant period in his/her dream.'

(Google 2012/05/12)

(49) 時光回退到 1800 年中期的湖南小鎮

shíguāng   huí-tuì   dào   NUM   nián zhōng   qí   de

time.frame   return-recede arrive   1800   year middle   period de

húnán   xiǎozhèn

Hunan   town

'The scene has traced back to the little town in Province of Hunan around the middle of

1800s.'

(Google 2012/05/12)

The above examples illustrate a group of non-spatial motion events describing the

temporal movement. It is observed that the moving entities in these motion events tend to be

a temporal reference that moves along the time frame. In fact, example (48) suggests that

someone's mental age has undergone a temporal shift back to the infant period. Such

temporal movement of returning may have 'someone's mental age' as moving entity and metaphorically employ the motion of *huí-tuì* 回退 'return to recede' to indicate the non-spatial temporal movement.

By the metaphor of motion, the stream of time can be extended as a long path with several time points which the movers may align on. In other words, the temporal shift of an event can be realized as non-spatial movements from a specific time point to another among the time stream.

4.3.3 Movement of Trend

Besides the non-spatial motion events expressing economic and temporal development, the growth or decline of some social or natural trend such as fashion or temperature can also be comprehend in terms of motion as noted below:

(50)　這股風潮很快便退落了。

　　zhè　　*gǔ*　　*fēngcháo*　*hěn*　　*kuài biàn*　　*tuì-luò*　　　*le*

　　This　spell　fashion　very　fast hence　recede-fall　ASP

　　'The spell of fashion has faded away in no time.'

　　(Google 2013/01/20)

(51)　台灣人對香港購物的狂熱逐年上升，

　　táiwānrén　*duì*　　*xiānggang*　　*gòuwù*　*de*　*kuángrè*

　　Taiwanese　towards　Hong Kong　shopping de　enthusiasm

　　zhú　　*nián*　　*shàng-sheng*

　　every　year　　go.up-ascend

　　'Taiwanese's enthusiasm for shopping in Hong Kong has grown every year.'

　　(Google 2013/01/20)

(52) 至三月初春，氣溫才逐漸上升。

zhì   sānyuè   chū   chūn   qìwēn   cái zhújiàn shàng-sheng

until   March   early   Spring   temperature   cai   gradually go.up-ascend

'The temperature hasn't come to rise until the early March.'

(Google 2013/01/20)

As we have known from the above examples, the growth of some social trend of fashion such as *gòuwù.de.kuángrè* 購物的狂熱 'enthusiasm for shopping' can be considered as an non-spatial movement to collocate with motion event *shàng-sheng* 上升 'go up to ascend.' The growth of the fashion may be perceived as vividly as physical action in aid of motion metaphors. In addition, example (52) depicts the non-observable rising of temperature by the metaphor of the motion event *shàng-sheng* 上升 'go up to ascend.' As a non-physical movement as the natural trend, *qìwēn.shàng-sheng* 氣溫上升 'the rising of temperature' can be drawn as a motion event in which *qìwēn* 氣溫 'temperature' is the mover adopts an upward movement *shàng-sheng* 上升 'go up to ascend.'

4.3.4 Movement of Mental Development

Many non-obsevable mental developments of human beings can be perceived as vividly as physical development by way of metaphorically usages of motion as exemplified below:

(53) 16 歲男孩記憶力下退

16   suì   nánhái   jìyìlì   xià-tuì

Num   age   boy   memory go.down-recede

'A sixteen-year-old boy undergoes memory decline.'

(Google 2012/12/27)

(54) 近視手術後如何防止視力回退？

jìnshìshǒushù   *hòu*   *rúhé*   *fangzhǐ*   *shìlì*   *huí-tuì*

myopia.surgery   after   how   avoid   vision   return-recede

'How can one avoid vision regression after a myopia surgery?'

(Google 2012/7/18)

4.4 Motion Sequences and Their Predominant Event Types

As shown by the observation from previous sections, Mandarin motion verbs are able to predicate spatial movements and also a variety of metaphorically non-spatial motion events. Since motion verbs can be alternatively ordered in either ways, each motion sequence in every alternated pair may behave differently in predicating motion events. A close look into their predominat event types in between alternated pairs argues that morphological sequencing of is correlated with their spatial and non-spatial distinction in predicating motion events. For instance, one pair of alternated motion sequence *tuì-huí* 退回 'recede to return' and *huí-tuì* 回退 'return to recede' show a semantic division in predicating spatial and non-spatial usages of motion by two motion sequences as exemplified blew:

(55) a. 垃圾車只好**退回**。

     b. 時間如流水，永遠都不會**回退**。

As shown by the above example, *tuì-huí* 退回 'recede to return' with V1 *tuì* 退 'recede' preceding V2 *huí* 回 'return' tends to predicate spatial usages of motion while *huí-tuì* 回退 'fall to return' in reversed order is prone to expressing non-spatial activities. The predominant event types for the alternated motion sequences is confirmed to shows a correlation with sequential ordering of motion verbs by a corpus-based investigation.

Motion Sequences (A)	Spatial Movement		Non-spatial Movement		Total
	count	percentage	count	percentage	
落下	258	91.81%	23	8.18%	281
退下	280	90.9%	28	9.09%	308
退回	303	74.44%	104	25.55%	407
升上	920	100%	0	0%	920
降下	3320	100%	0	0%	3320
降回	31	77.5%	9	22.5%	40
落回	48	94.11%	3	5.88%	51
升回	920	100%	0	0%	920
Motion Sequences (B)	Spatial Movement		Non-spatial Movement		Total
	count	percentage	count	percentage	
下落	12	100%	0	0%	12
下退	5	45.45%	6	54.54%	11
回退	0	0%	8	100%	8
上升	6471	8.29%	71564	91.7%	78035
下降	0	0%	95676	100%	95679
回降	0	0%	340	100%	340
回落	0	0%	1228	100%	1228
回升	0	0%	2820	100%	2820

Table 7: Predominant Event Types of Alternated Motion Sequences

As depicted by the table, motion sequences such as *luò-xià* 落下 'fall to go down' from Group (a) tend to predict spatial motion events while their reversed counterparts from Group (b) such as *xià-luò* 下落 'go down to fall' are prone to non-spatial activities. In fact, most of the motion sequences in Group (a) are constructed in one order reversed to that of motion sequences in Group (b) as evidenced by the contrast between *luò-xià* 落下 'fall to go down' and the reversed sequence *xià-luò* 下落 'go down to fall'.

One may wonder how the sequential ordering of motion verbs may relate to the predicational types of motion events. What is the underlying mapping mechanism that determines such form-to-functional interrelation in alternated motion sequences? We aim to explore the mapping relation by suggesting that the spatial vs. non-spatial distinction of

motion events show that morphological sequencing of motion verbs is correlated with semantic properties that are essential in defining motion events. We will provide a frame-based analysis so as to account for the above concerns in the next chapter.
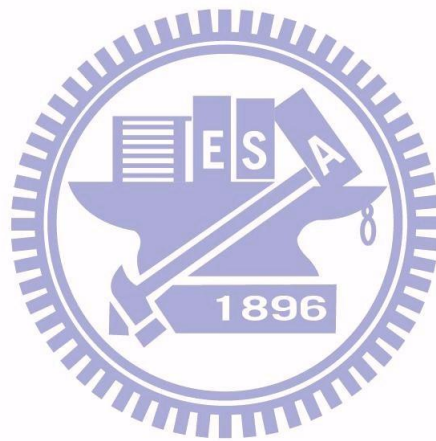
Chapter 5

Analysis

This chapter will account for the above concerns regarding the alternated motion sequences. First, we will respond to the collo-constructional variations between alternated motion sequences via a thorough inspect on their lexicalization patterns with these verb-internal components in relation with their verb-external participants to postulate the syntactic-to-semantic correlation among every pairs of these motion sequences. Second, we will tackle the sequential mechanism governing alternated motion sequences to realize the morphological mapping with semantic distinction of spatial and non-spatial motion events. Finally, we will incorporate the motion sequences into the framing system by Liu and Chiang (2008) to categorize motion sequence under the multi-layered taxonomy. Section 5.1 presents the alternated mechanism in linearizing motion sequences. Section 5.2 will account for the distributional frequency among these alternated pairs of motion sequences. Section 5.3 will explain the collocational variations by a thorough inspect on the syntactic-to-semantic correlation between alternated motion sequences. Section 5.4 will postulated the morphological mapping with event types of motion manifested in alternated motion sequences. Section 5.5 provides the frame-based analysis of motion sequences under the hierarchical taxonomy.

## 5.1 Sequential Mechanism: Conformed and Reverse Sequences

Motion sequences can be linearized in an alternative fashion as shown below:

(56) *jiàng-xià* 降下 'descend to go down'   vs.   *xià-jiàng* 下降 'go down to descend'

(57) *tuì-xià* 退下 'recede to go down'   vs.   *xià-tuì* 下退 'go down to recede'

(58) *sheng-shàng* 升上 'ascend to go up'   vs.   *shàng-sheng* 上升 'go up to ascend'

By adopting the PMS (Liu et al. 2012a), we aim to explain the underlying sequential mechanism of these alternated motion sequences by examining their lexicalization patterns with semantic components. For example, motion sequence *jiàng-xià* 降下 'descend to go down' is composed in a sequence of V1 *jiàng* 降 'descend' preceding V2 *xià* 下 'go down.' The semantic components lexicalized in *jiàng* 降 'descend' denote an underlying semantic portion ranging from Route to Direction while V2 *xià* 下 'go down' encodes a semantic range from Route to Endpoint. In the sequence of *jiàng-xià* 降下 'descend to go down', the Endpoint component encoded in *xià* 下 'go down' would semantically outrange Direction component lexicalized in *jiàng* 降 'descend' towards the right respecting the left-to-right order depicted in the PMS. The following principle is hereby proposed to illuminate the sequential mechanism.

I.   **Conformed Motion Sequence**
Given any two serial motion verbs, V2 should outrange V1 towards the right to observe the default sequence of the motion schema.
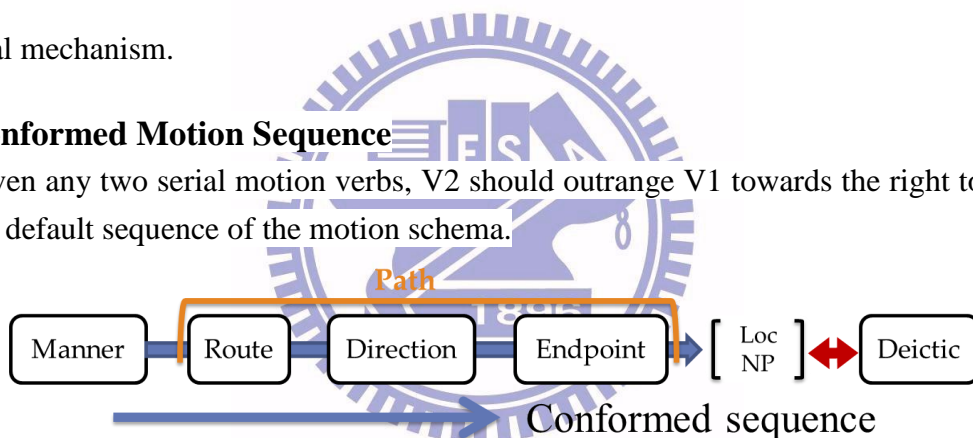
By this principle, motion sequence *jiàng-xià* 降下 'descend to go down' is linearized in a conformed sequence as depicted below:
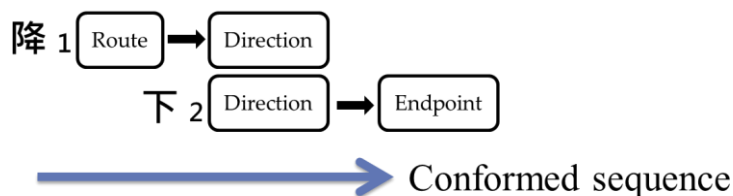

Figure 7: Sequential Organization of 降下

In addition to the conformed sequence as *jiàng-xià* 降下 'descend to go down', the reversed order as *xià-jiàng* 下降 'go down to descend' is also observed. To be specific, motion sequence 下降 'go down to descend' is composed in a sequence of V1 *xià* 下 'go

down' preceding V2 *jiàng* 降 'descend' preceding. In view of the PMS, motion verb *xià* 下 'go down' sets up a semantic range from Direction to Endpoint while *jiàng* 降 'descend' encodes a portion ranging from Route to Direction. In the sequence of *xià-jiàng* 下降 'go down to descend', the semantic range of V1 *xià* 下 'go down' would override that of V2 *jiàng* 降 'descend' in a recessive way with Endpoint preceding Route, clearly not abiding the default order depicted in the PMS. Another pricinciple is therefore proposed to account for the reversed ordering relations among verbs of motion as illustrated below:

II. Reversed Motion Sequence

Given any two serial motion verbs, they can be composed in a reversed sequence in which the semantic range of V1 overrides that of V2 in a recessive order against the default order depicted in the PMS.
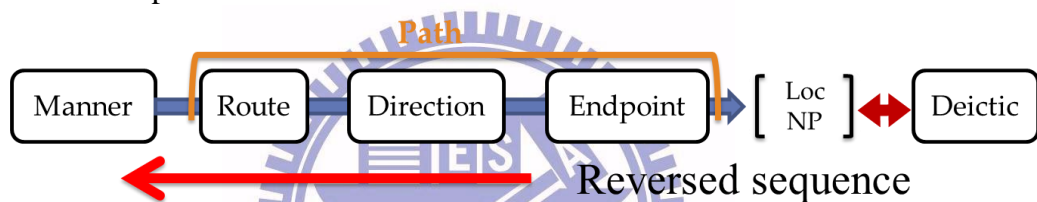
Following this principle, we may explain sequential ordering of *jiàng-xià* 下降 'go down to descend' by viewing it as a reversed sequence with Endpoint component preceding Route component in a recessive way against the iconic sequence from the PMS.
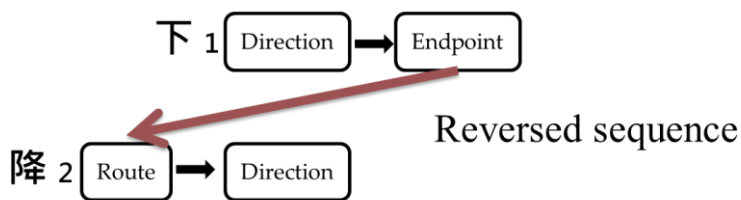

Figure 8: Sequential Organization of 下降

5.2 Distributional Frequency of Alternated Motion Sequences

As we have investigated how alternated motion sequences are distributed in the corpus, an unequal distributional pattern in between every pair of alternated motion sequences is observed. Many conformed sequences such as *tuì-xià* 退下 'recede to go down' tend to win over their reversed counterpart *xià-tuì* 下退 'go down to recede' at the distributional frequency as illustrated below:

	Conformed Sequence		Reversed Sequence	
1	a.落下	95.9% (281/293)	b.下落[5]	4.09% (12/293)
2	a.退下	96.55% (308/319)	b.下退	3.44% (11/319)
3	a.退回	98.07% (407/415)	b.回退	1.92% (8/415)
4	a.降落	99.36% (1400/1409)	b.落降	0.63% (9/1409)
5	a.退落	89.55% (60/67)	b.落退	10.44% (7/67)
	Predominant		**Less Predominant**	

Table 8: Distributional Frequency of Alternated Motion Sequences (1)

As one of the synonyous sequences from the alternated pairs, many reversed motion sequences such as *xià-luò* 下落 'go down to fall' have more restricted distribution across the corpus than their conformed sequence *luò-xià* 落下 'fall to go down.' As indicated by Jia (1996), Mandarin compounds are formed at the early stage with a rather loose and alternative fashion linearizing monomorphemic lexicons. As they form a synonymous alternated pairs denoting similar motion events, conformed and reversed motion sequences start to compete with each other in occurrence of language uses. The collocational patterns of alternated motion sequences from Chapter 4 have confirmed that conformed motion sequences wins over the reversed sequences at their compatibility in collocating with a wider variety of syntactic patterns while reversed motion sequences are rather restricted with a small set of

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[5] Only the verbal use of motion sequence 下落 is included. The nominal use is 下落 is excluded.

them. Therefore, we may claim that conformed sequences win over the reversed sequences in competition for language uses.

However, Table 9 suggests another story that some reversed motion sequences may turn out more predominant than conformed sequences as described below:

	Conformed Sequence		Reversed Sequence	
1	a.降下	3.35% (3320/98999)	b.下降	96.64% (95679/98999)
2	a.升上	1.16% (920/78955)	b.上升	98.83% (78035/78955)
3	a.升回	1.22% (35/2855)	b.回升	98.77% (2820/2855)
4	a.降回	10.52% (40/380)	b.回降	89.47% (340/380)
5	a.落回	1.06% (51/4787)	b.回落	98.93% (4736/4787)
	Less Predominant		**Predominant**	

Table 9: Distributional Frequency of Alternated Motion Sequences (2)

Table 9 presents a predominant distribution skewed to reversed sequence among these alternated pairs. As we know alternated motion sequences are formed as synonymous pairs at the early stage, they would undergo a serious competition for language use and lead to unequal distributional frequency. Generally speaking, reversed sequences such as *xià-jiàng* 下降 'go down to descend' are predicted to be less preferred to their conformed counterpart *jiàng-xià* 降下 'descend to go down'. On the contrary, many reversed sequences, however, actually win out at their distributional frequency as illustrated in Table 12. Moreover, these frequently occurring reversed motion sequences are predominantly used to predicate non-motional events as shown below:

(59)　全球股價**上升**。

　　quánqiú gǔjià　　　　　*shàng-shēng*

　　global　share.value　　go.up-ascend

　　'The global values are rising.'

(Google 2013/01/13)

(60)　　咖啡出口大幅度**下降**。

kāfēi　　chūkǒu　　dàfúdù　　　　xià-jiàng

coffee　export　　dramatically　go.down-descend

'The level of coffee exports has dramatically declined.'

(Google 2013/01/06)

(61)　　九月製造業景氣**回降**。

jiǔyuè　　　　zhìzàoyè　　　　　　jǐngqì　　　huíjiàng

September　　manufacturing.business　prosperity　return-fall

'The prosperity of manufacturing business fell back to the previous level.'

(Google 2012/12/27)

　　　We have observed a highly frequenct occurrence of reversed motion sequences such as *huí-jiàng* 回降 'return to descend' and *huí-luò* 回落 'return to descend' predominantly used to conceive the conceptually non-motional event by way of motional metaphor from spatial to non-spatial domain.

　　　To account for the frequent occurrence of reversed motion sequences for non-spatial uses, we look closely into their lexicalization patterns. These highly frequent reversed motion sequences actually encode a semantic range ending at the component Direction in view of the motional path in the PMS. Reversed motion sequence *huí-jiàng* 回降 'return to descend', for example, lexicalizes Route and Direction. *Xià-jiàng* 下降 'go down to descend' ends up with only Direction component according to the Boundary Setting Principle in Liu et al. (2012b). Following the PMS, we believe that a motional course generally consists of a passing middle point, a spatial orientation, and a path delimiting endpoint. Reversed motion sequences

encode a restricted portion ending at Direction, signifying a movement toward a spatial orientation without specifying a path delimiting endpoint.

Furthermore, the unique properties of the semantic component Direction encoded in these reversed motion sequences contribute to their predominant distribution. These motion sequences end with a Direction-encoded verb such as *shēng* 升 'ascend' and *jiàng* 降 'descend' which describe an absolute orientation 'upward' or 'downward', instead of a relative orientation implied in verbs like *tuì* 退 'recede' whose direction is defined relatively. The reversed motion sequence *huí-jiàng* 回降 'return to descend' morphologically and semantically ends with an orientational specifier *jiàng* 降 'descend'. In reporting a non-spatial motion by way of metaphorical extention, the reversed motion sequences are used more predominantly to denote an orientational Direction in non-spatial domains. In view of the commonality of orientational metaphors, Lakoff (2008) has pointed out that spatial orientation like upward or downward provide a rich basis for understanding concepts in orientational relation and give rise to a large use of orientational metaphors. We may predict that reversed motion sequences with orientational Direction shows higher distributional frequency since they bring out a large use of orientational metaphors for transferring physical movement to non-spatial usage of motion.

## 5.3 Syntactic-to-semantic Correlation

As motion sequences can be defined as conformed or reversed sequences, Mandarin alternated motion sequences show collocational variations between conformed and reversed sequences in every alternated pairs. The corpus-based investigation on their collocational patterns with various participant roles is presented in Table 10.

Motion Sequences / Re-ocurring Patterns	Conformed	Reversed
1. Figure <＊	✔（退下）	✔（下退）
2. Figure <＊< Locative NP	✔（降回）	✘
3. Locative NP <＊< Figure	✔（降下）	✘
4. Figure <＊< Extent	✘	✔（上升）
5. Figure <＊<｛到｝< Locative NP	✔（落回）	✔（回落）
6. Figure <＊< Deictic	✔（升上）	✘
7. Figure <＊< Deictic < Locative NP	✔（退回）	✘
8. Figure < Manner <＊< Deictic	✔（落下）	✘
9. Figure < Manner <＊<｛到｝< Locative NP	✔（落下）	✘

Table 10: Reocurring Patterns with Conformed and Reveresed Motion Sequences

To account for the collocational variation between motion sequences in conformed and reversed sequences, we will examine the lexical internal features and identify the lexicalization patterns in these motion sequences by the Boundary Setting Principle proposed by Liu et al. (2012b). The principle explain how verbs of motion determine the internal components they lexicalize according to the semantic range of these from the PMS. Take motion sequences *luò-xià* 落下 'fall to go down' for example, motion verb *luò* 落 'fall' has a semantic range from Route to Direction while *xià* 下 'go down' lexicalizes Direction and Endpoint. The lexicalization pattern of motion sequences *luò-xià* 落下 'fall to go down' can be illustrated below:
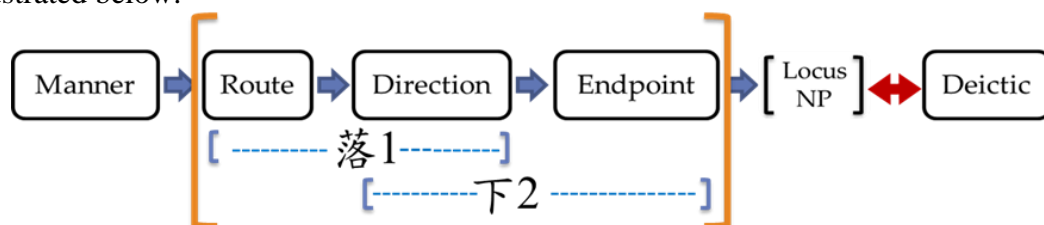
According to the principle, motion verb *luò* 落 'fall' in the V1 position in a [V$_1$V$_2$] sequence delimit the leftmost boundary at Route and *xià* 下 'go down' in the V2 position set the rightmost boundary at Endpoint, ending up with a semantic range from Route to Endpoint. Adopting this Boundary Setting Principle, we look into the lexicalization patterns of motion

sequences from conformed and reversed sequences. As we know conformed motion sequences *luò-xià* 落下 'fall to go down' has encoded a semantic range: [Route, Direction, Endpoint] , its reversed counterpart *xià-luò* 下落 'go down to fall' turns out to lexicalize only Direction as shown below:
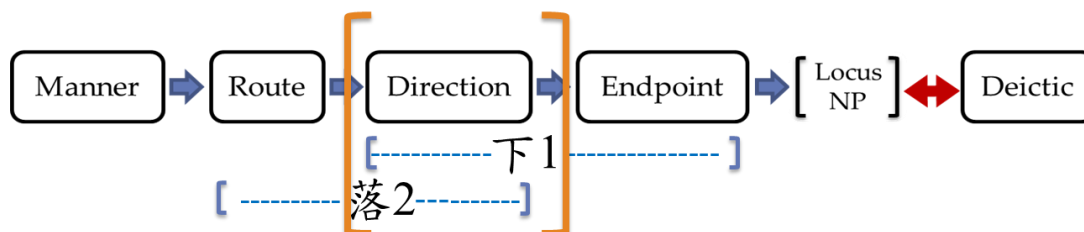
In addition to *luò-xià* 落下 'fall to go down' and *xià-luò* 下落 'go down to fall', let's see another pair of alternated motion sequences *luò-huí* 落回 'fall to return' in conformed sequence and the reversed sequence *huí-luò* 回落 'return to fall.' As motion verb *huí* 回 'return' lexicalizes a semantic range from Route to Endpoint, motion sequence *luò-huí* 落回 'fall to return' ends up with Route, Direction, and Endpoint. On ther other hand, motion sequence *huí-luò* 回落 'return to fall' delimits its rightmost boundary at Direction by *luò* 落 'fall', end up with Route and Direction encoded. Motion sequences from both groups and their lexicalization patterns can be summarized here.

Motion Sequences		Lexicalization Patterns
Conformed	落下	Route + Direction + Endpoint
	落回	
Reversed	下落	Direction
	回落	Route + Direction

Table 11: Lexicalization Patterns of Alternated Motion Sequences

The above table shows that conformed motion sequences and reversed sequence are distinct in lexicalizing Endpoint component. Conformed motion sequences are composed in a lexicalization pattern with Endpoint encoded, which helps explain the collocational variation with participant roles.

First of all, Liu et al. (2013) pointed out that Endpoint-encoded verbs may partially require a Loc-NP or have the privilege to collocate with a path-delimiting element as specifying the notion of Endpoint. Therefore, conformed motion sequences tend to take Locative NPs as NP complements for encoding Endpoint components. On the contrary, reversed sequences such as *huí-luò* 回落 'return to fall' do not encode Endpoint component and hence may appear alone without Locative NPs. Example (62) illuminates their collocational variation between conform sequence *luò-huí* 落回 'fall to return' and reversed sequence *huí-luò* 回落 'return to fall.'

(62) a. 有毒氣體卻正每天**落回**[地面/**Locative NP**]，

      yǒudú   *qìtǐ què zhèng*   *měitiān*   *luò-huí*   *dìmiàn*

      poisonous   air   Adv Pros   every.day   fall-return   ground

      'The poisonous air falls to the ground every day.'

      (Google 2012/11/06)

    b. 市場糧價**回落**，

      shìchǎng   *liàng*   *jià*   *huí-luò*

      market   provisions   price   return-fall

      'The price of provisions has declined.'

      (Google 2012/11/06)

We have known that reversed motion sequences semantically encode a range at Direction. Many of them do not require a NP complement describing the final destination of motion contour. However, they may choose a NP adjunct specifying the extent of motion progression as described below.

(63) a. 十五的月亮**升上**了[天空/Locative NP]。

      shíwǔ   *de*   *yuèliàng sheng-shàng*   *le*   *tiānkōng*

      fifteen   de   moon   ascend-go.up ASP sky

'The moon has risen up to the sky.'

(Google 2013/06/07)

b. 死亡率**上升**了不只[十倍/Extent of Motion]。

sǐwáng   *lǜ*   *shàng-shēng*   *le*   *bùzhǐ*   *shí*   *bèi*

death   rate   go.up-ascend   ASP more   Num   time

The mortality rate has risen by more than time times

(Google 2013/06/07)

The above example presents different participant roles involved in conformed and reversed motion sequences. We may claim that conformed motion sequences, as encoding Endpoint component, may partially take a NP complement to specify the endpoint of the motional path as in (63a) while the reverserd counterparts, semantically ending at Direction, tend to collocate with a NP adjunct to denote the progression of motion as in (63b).

In addition to Locative NPs, Endpoint-encoded sequences are also highly associated with Deictic of Motion as *luò-xià qù* 落下去 'fall to go down.' According to Liu et al. (2013), Deictic of motion regards the Speaker as the deictic center for the moving entity to move towards the Speaker by lái 來 'come' or away from the Speaker by qù 去 'go'. Also they suggest that Deictic of Motion may be used to delimit a path-endpoint without a Locative NP as shown below:

(64) 老公回去了，

lǎogong   *huí*   *qù*   *le*

husband   return   go   ASP

'My husband has returned to (somewhere).'

(Google 2013/06/09)

As Deictic of Motion may help signify the end of the motional path, we therefore suggests that Endpoint-encoded conformed motion sequences are prone to collocating with Deictic of Motion which is semantically compatible with the Endpoint component. On the other hand, reversed motion sequences are restricted to have deictic complements as we have observed from the re-occurring patterns with Deictic of Motion.

(65) a.咖啡價格為什麼沒降回[去/Deictic]嗎？

kāfēi	*jiàgé*	*wèishéme*	*méi*	*jiàng-huí*	*qù*	*mā*
coffee	price	wh-	Neg	descend-return	go	ma

'Why is there no decline on the price of coffee?'

b. ?咖啡價格為什麼沒回降[去/Deictic]嗎？

(66) a. 腰上的淤青退下[去/Deictic]一點,

yāoshàng	*de*	*yūqīng*	*tuì-xià*	*qù*	*yìdiǎn*
waist	de	bruise	recede-go.down	go	little

'The bruise around my waist has reduced a little bit.'

b. *腰上的瘀青下退[去/Deictic]一點

(67) a. 給我退回[去/Deictic]！

gěi	*wǒ*	*tuì-huí*	*qù*
order	I	recede-return	go

'Go back to where you come from!'

b. *給我回退[去/Deictic]！

We claim that reversed motion sequences such as *jiàng-huí* 降回 'descend to return' do not lexicalize Endpoint. Since Deictic of Motion may function as Endpoint delimiting the end of motion contour, reversed motion sequences without Endpoint are hence less compatible

with Deictic of Motion. Moreover, Liu et al. (2012a) states that Endpoint is followed by Deictic of Motion from the PMS. Endpoint-encoded verbs can take Deictic of Motion following to specify the speaker-oriented relation. However, motion verbs with a semantic range at Direction may not direct precede Diectic of Motion by overriding the intervening Endpoint component. Hence, we claim that reversed motion sequence may not collocate with deictic complements for the lack of Endpoint component.

In addition to the collocational variation with participant roles, Mandarin alternated motion sequences have also suggested their distinct compatibility with perfective aspectual marker *le* 了 and durative aspectual marker *zhe* 著.

Motion Sequences		Aspectual Markers	
		le	*zhe*
Conformed	落下, 退下, 降下, 升上 落回, 退回, 升回, 降回	✔ (Locative NPs preferred)	✗
Reversed	下落, 下退, 下降, 上升 回落, 回退, 回升, 回降	✔	✔

Table 12: Collocation with Aspectual Markers of Conformed and Reversed Sequences

First of all, Mandarin aspectual marker *le* 了, according to Li and Thompson (2007), has also indicated a viewing perspective of a event as a whole. The corpus observation has shown that reversed motion sequences are predominantly used with aspectual marker *le* 了 while conformed motion sequences are more restricted to collocate with it.

(68) a. 死亡率上升了不只[十倍/Extent of Motion]。

sǐwáng lǜ shàng-shēng le bùzhǐ shí bèi

death rate go.up-ascend ASP more Num time

The mortality rate has risen by more than time times

(2013/06/07)

b. *十五的月亮升上了[天空/Locative NP]。

(69) a. 後來原物料的價格稍微回降了**[**一些/Extent of Motion**]**

     hòulái   *yuánwùliào de jiàge shāowéi huí-jiàng*   *le*   *yì*   *xiē*

     afterwards ingredient   de price slightly return-descend ASP Num bit

     'The price of ingredients goes through a slight decline.'

     (Google 2013/06/06)

   b. ?全部電梯由高層緩緩降回了[地面/Locative NP]，

As collocating with reversed motion sequences such as *huí-jiàng* 回降 'return to descend', aspectual marker *le* 了 describes the motion event as a whole. However, the example (68b) is less acceptable since an Endpoint-encoded motion sequences can not be viewed as a whole and perfectualized motion event without a Locative NP or deictic complements. Reversed motion sequences have only encoded Route and Direction components, specifying a portion of a motional path. Since they can represent a whole motion event alone with aspectual marker *le* 了, we therefore claim that a motion event can be viewed as a whole without Endpoint component. On the other hand, conformed motion sequences such as *jiàng-huí* 降回 'descend to return' are endpoint-encoded sequences and hence can not report a whole event alone without Locative NPs or deictic complements delimiting the path-endpoint of a motional path.

In addtition to *le* 了 indicating a perfectualized and telic event, motion sequences may collocate with another Mandarin aspectual marker *zhe* 著 reporting a durative state of a event. The corpus observation from Chapter 4 reveals that many reversed motion sequences may co-occur with aspectual marker *zhe* 著 while conformed sequences may not.

(70) a. 價格卻一直在緩慢地上升著。

     jiàgé què   *yìzhí*   *zài huǎnmàn de shàng-shēng zhe*

     price instead always   zai slowly   Adv go.up-ascend zhe

     'The price has been rising all the time in a slow pace.'

(Google 2013/06/16)

b. ?十五的月亮升上著天空。

(71) a. 身體的溫度則是在不斷的下降著。

shēntǐ de wēndù   zéshì   zài búduàn   de   xià-jiàng   zhe

body   Pos temperature instead zai continuous Adv go.down-descend zhe

'The body temperature has been continued to decline.'

(Google 2013/06/16)

b. ?黃山風景區降下著入冬以來第一場大雪。

According to how both sequences lexicalize semantic components, we have known that conformed motion sequences such as *sheng-shàng* 升上 'asecned to go up' has encoded a semantic range from Route to Endpoint while the reversed sequence *shàng-sheng* 上升 'go up to ascend' has only encoded Direction component. Given that Endpoint-encoded verbs imply an endpoint of the path, the motion event is viewed as a bounded event which suggests the Figure to arrive at the bounded endpoint instantaneously incompatible with durative adverbials or aspectual markers. Therefore, endpoint-encoded motion sequences such as *sheng-shàng* 升上 'asecned to go up' is not compatible with aspectual marker *zhe* 著 since it does not allow Figure to stop at any intermediate points along the motion path. Conformed sequences with Endpoint component tend to express a telic and bounded event in which a moving entity denotes a punctual action arriving at the motional endpoint.

On the other hand, reversed motion sequences are compatible with aspectual marker *zhe* 著 since they have only encoded a semantic range at Direction, which does not imply the end of motion. In this sense, they are viewed as unbounded events which allow durative adverbials to specify the gradual progression of motion. Furthermore, as Direction component denotes an orientation the moving entity move toward instead of the final destination to reach,

reversed motion sequences encoding Direction are compatible with durative aspectual marker *zhe* 著 to report a atelic and unbounded action since they do not lexically implicate a located endpoint on the motional path.

5.4 Semantic-to-morphological Correlation

Motion sequences can be linearized in a conformed sequence or reversed sequence as *luò-huí* 落回 'fall to return' and *huí-luò* 回落 'return to fall' according to the principles mentioned above. Moreover, as we investigate their event types of motion, we have observed that motion sequences may predicate spatial and non-spatial usages of motion as shown below:

(72) a. 有毒氣體卻正每天落回地面，

       yǒudú   *qìtǐ*   *què*   *zhèng*   *měitiān*   *luò-huí*   *dìmiàn*

       poisonous   air   Adv   Pros   every.day   fall-return   ground

       'The poisonous air falls down on the ground every day.'

       (Google 2012/11/06)

    b. 市場糧價回落，

       shìchǎng   *liàng*   *jià*   *huí-luò*

       market   provisions   price   return-fall

       'The price of provisions fell.'

       (Google 2012/11/06)

Conformed sequence *luò-huí* 落回 'fall to return' predicates spatial motion event while the reversed sequence *huí-luò* 回落 'return to fall' is used for non-spatial predication. Many pairs of alternated motion sequences are observed to behave in similar way as denoting the spatial and non-spatial distinction. To account for the form-to-functional correlation, we have a thorough inspect on event types predicated by conformed and reversed sequences.

Table 13 present the interrelation between sequential order and event types.

Conformed Sequences	Spatial Movement		Non-spatial Movement		Total
	count	percentage	count	percentage	
落下	258	91.81%	23	8.18%	281
退下	280	90.9%	28	9.09%	308
退回	303	74.44%	104	25.55%	407
升上	920	100%	0	0%	920
降下	3320	100%	0	0%	3320
降回	31	77.5%	9	22.5%	40
落回	48	94.11%	3	5.88%	51
升回	920	100%	0	0%	920
Reversed Sequences	Spatial Movement		Non-spatial Movement		Total
	count	percentage	count	percentage	
下落	12	100%	0	0%	12
下退	5	45.45%	6	54.54%	11
回退	0	0%	8	100%	8
上升	6471	8.29%	71564	91.7%	78035
下降	0	0%	95676	100%	95679
回降	0	0%	340	100%	340
回落	0	0%	1228	100%	1228
回升	0	0%	2820	100%	2820

Table 13: Predominant Event Types of Conformed and Reversed Motion Sequences

As depicted by the above table, the spatial and non-spatial distinction predicated by motion sequences is confirmed by the corpus-based investigation on their morphological sequencing. The upper part of the table includes motion sequences in comformed sequences and motion sequences in the lower part of it are linearized in reversed order. Table 13 suggests that sequences in conformed order tend to predicate spatial or physical motion activities as *yè.zi luò-xià lái* 葉子落下來 'a leaf falls down' in (73a). Reversed sequences in lower part of the table, on the other hand, tend to have predominant predication to non-spatial motion activities as shìlìhuí-tuì 視力回退 'vision regression' in (73b).

(73) a. 一片葉子落下來。

    yí   *piàn*   *yèzi*   *luò-xià*   *lái*

    one   CL   leaf   fall-go.down come

    'A leaf is falling down.'

    (Google 2013/01/06)

b. 近視手術後如何防止視力回退？

    jìnshìshǒushù   *hòu rúhé fangzhǐ*   *shìlì*   *huí-tuì*

    myopia.surgery   after how avoid   vision   return-recede

    'How can one avoid vision regression after a myopia surgery?'

    (Google 2012/07/18)

The prevailing pattern illustrated by conformed and reversed motion sequences reveals a pairing relation between their sequential order and their predominant event types as suggested below:
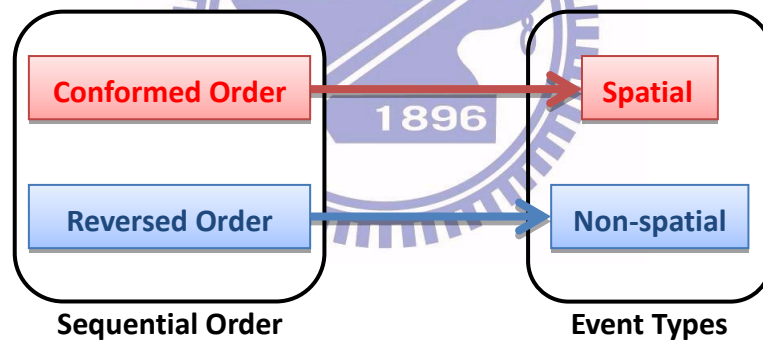

We may say that motion sequences in the conformed order in the Schema are prone to expressing spatial movement since it is rather basic to motion event in human mind. However, motion sequences exhibiting non-spatial events of motion overtly choose the revered order as signifying their unique semantic attributes. The spatial and non-spatial distinction is hereby realized on sequential mechanism as conformed and reversed order. The sequential mapping with event types can be explained by the notion of Construction proposed by Goldberg (1995), who stated that: 'Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other

constructions recognized to exist. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency.' On the constructional view, the form of construction may be linked to a meaning including all associated functions of the construction.

Following the constructional view, the mapping relation between sequential order and predicational types can be understood as a form-to-function pairing relation. Motion sequences pertaining to spatial events are overtly composed in conformed sequence following the iconic sequence in the PMS. On the other hand, another set of motion sequences are prone to choosing a reverse order as exhibiting mephorically extended non-spatial motion events. In view of Constructional Grammar, the morphological combinations of these motion sequences can be associated with lexical features. We may conclude that two ways of sequential combinations serves to signify the spatial and non-spatial distinction in event types of motion.

5.4.1 Unspecified Motion Sequences

As we have known that verb of motion can be linearized into either conformed or reversed order, the sequential relation in some motion sequences, however, are not clearly revealed as those discussed above. For example, verbs of motion *sheng* 升 'ascend', *jiàng* 降 'descend', *tuì* 退 'recede', and *luò* 落 'fall' belong to a semantic portion with Route and Direction components in the PMS by Liu et al. (2012a) as shown below:
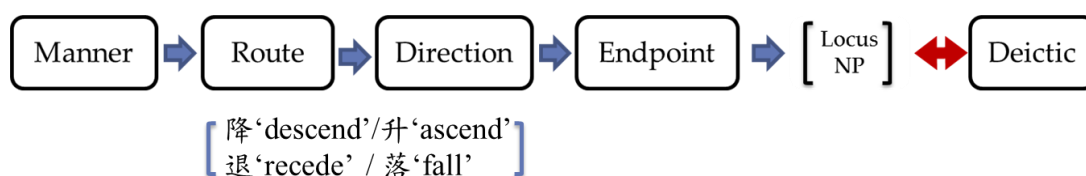
When verbs of motion from the same portion are combined with each other into a sequence, it is not clear to determine whether they are sequentially conformed or reversed to the default order of the PMS. That is to say, motion sequence such as 降落 *jiàng-luò* 'descend

to fall', 落降 *luò-jiàng* 'fall to descend', 退落 *tuì-luò* 'recede to fall', 落退 *luò-tuì* 'fall to recede' are unspecified in their sequential relation. The distributional frequency of these two pairs of motion sequences is illustrated below.

	Predominant		Less Predominant	
1	a.降落	99.36% (1400/1409)	b.落降	0.63% (9/1409)
2	a.退落	89.55% (60/67)	b.落退	10.44% (7/67)

Table 14: Sequences of Verbs from the Same Portion of Route and Diretion

As we can see from Table 14, motion sequences *jiàng-luò* 降落 'descend to fall' and *tuì-luò* 退落 'recede to fall' show higher distributional frequency than those of their reversed counterparts. With a closer inspect into their combinational patterns, we found that *luò* 落 'fall' at V2 position following V1 in a VV sequential combination is a predominant pattern. Liu et al. (2013) have noticed that *luò* 落 'fall' may also take a Locative NP without Endpoint component. Under some fuzzy boundary defining verbs of motion, nevertheless, there remain borderline cases such as *luò* 落 'fall' lexically taking a non-referring Locative NP as illustrated below:

(74) 隕石落[水面]Loc-NP

   yǔnshí   *luò* [*shuǐ*   *miàn]*

   aerolite   fall   water   surface

   'The aerolites fell to the water.'

   (Google 2013/06/01)

Corpus investigation suggests *luò* 落 'fall' are frequently found in collocations with non-referring Locative NP as *luò.dài* 落袋 'fall into bags' and *luò.dì* 落地 'fall on the ground.' We therefore come to claim that *luò* 落 'fall' may implicate a meaning facet denoting Endpoint. Along the vein, motion sequences *jiàng-luò* 降落 'descend to fall' and *tuì-luò* 退落

'recede to fall' are considered as in conformed order with Endpoint- implicating verb *luò* 落 'fall' in the rightmost position. Therefore, the frequency occurrence of *jiàng-luò* 降落 'descend to fall' and *tuì-luò* 退落 'recede to fall' is confirmed by their linearizing fashion in conformed sequence as a result of competition for language uses.

**5.5 Frame-based Analysis of Mandarin Motion Sequences**

According to Liu and Chiang (2008), a Conceptual Schema (CS) isllustrates the cognitive background of an event with a set of default role participants, that is, the Frame Elements (FEs). The conceptual schema describes a cognitive basis of a certain frame and the frame-to-frame relationship among its subframes. Reviewing the PMS by Liu et al. (2012a), several essential semantic components that are crucial to self-initiated motion have been identified as semantic components encoded in various motion verbs. As a cognitive representation of motion, the PMS has integrated the verb-internal lexical features in verbs of motion together with the verb-external participant roles co-ocurring with them. As illustrated by Liu et al. (2013), [Manner], [Route], [Direction], and [Endpoint] are identified as verb-internal components as in (75b). On the other hand, we have verb-external elements in (75a) as *rìběn* 日本 'Japan' specifying Route, *dōng* 東 'east' denoting Direction, and *měiguó* 美國 'America' describing Endpoint.

(75) a. 他　[飛]_{Manner} [經日本]_{Route}　　[往東]_{Direction}　　[到美國]_{Endpoint}

　　　tā　fēi　　*jīng　　rìběn*　　*wǎng　　dōng*　　*dào　　měiguó*

　　　he　fly　　through　Japan　toward　east　　arrive　America

　　　'He flew east through Japan to America.'

　 b. 球　[滾]_{Manner} [落]_{Route} [進]_{direction}　　[到]_{Endpoint} 洞裡

　　　qiú gǔn　　luò　　jìn　　　　dào dònglǐ

　　　ball roll　　fall　　enter　　　arrive　hole

'The ball rolled-fell into the hole.'

(Liu et al. 2013)

Along the vein, external participants *rìběn* 日本 'Japan', *dōng* 東 'east', and *měiguó* 美國 'America' are viewed as frame elements specifying the self-initiated motion. We suggests the self-initiated motion is plotted with frame elements: 1) Figure, 2) Ground, 3) Route NP, 4) Directional NP, 5) Locative NP, and 6) Deictic as displayed in the conceptual schema of self-initiate motion as show below.
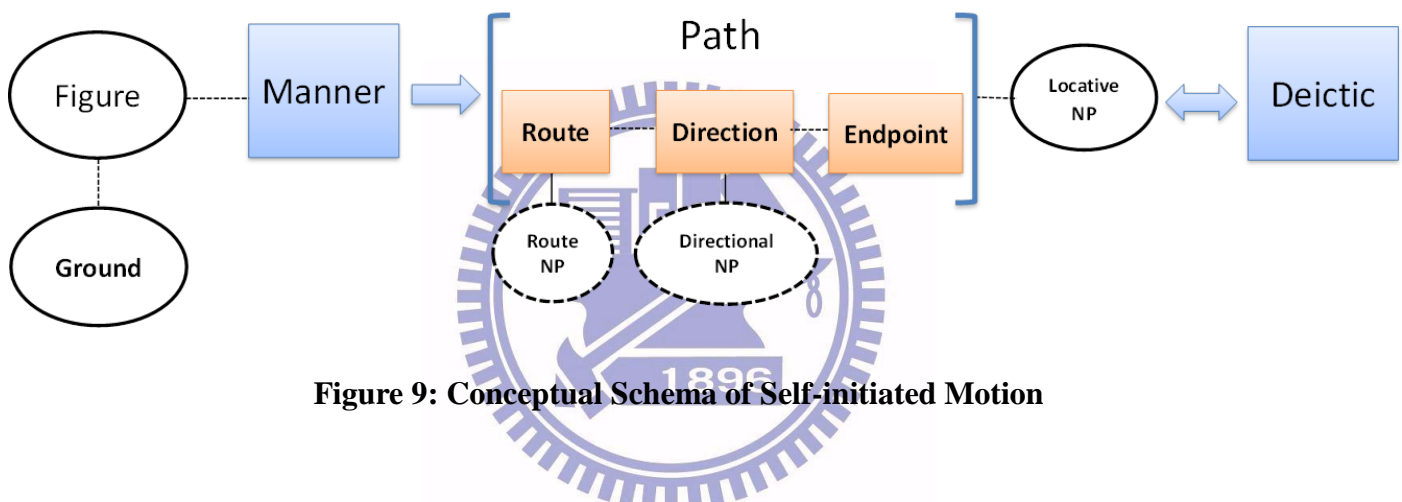
Figure 9: Conceptual Schema of Self-initiated Motion

In the conceptual schema, a moving entity (Figure) adopts a particicular way of movement (Manner). With a certain manner of motion, the moving entity decides on the motional contour in which it may pass an immediate point (Route NP) toward a location (Directional NP) and reach its final destination (Locative NP). The moving entity may lauch a movement without a specific motional contour taking place in a setting (Ground). The speaker-oriented perspective of moion (Deictic) is independently specified in schematizing the self-initiated motion. Incorporated into Motion, Deictic verbs serve as an optional marker indicating the spatial orientation in relation to the deictic center, the Speaker. Moreover, the notion of Deictic is commonly used to signify the relative position of the Speaker to Locative NP. In this sense, Deictic also helps to locate a Speaker-centered endpoint.

5.5.1 The Hierarchical Structure of the Frame

Following the assumption that meanings of verbs can only be defined in semantic frame bu profiled lexical elements (Fillmore and Atkins 1992, Goldberg 2005), Mandarin motion sequences are analyzed and categorized by a frame-based hierarchical taxonomy, by Liu and Chiang (2008) with a multi-layered structured classification of semantic frames: Archiframe > Primary frame > Basic frame > Microframe. Frames in the higher level denote a broader scope of certain semantic domain with background informain. Frames in the lower level inherit from upper frames and provide frame-specific description. Based on the findings in previous chapters, Mandarin motion sequence can be categorized into specific frames, which will be analyzed into different layers. In this section, we will introduce each frame under the hierarchical structures with conceptual schema, definitions, participant roles, defining patterns, and representative lemmas. Section 5.4.1 introduces the Archiframe of Self-initiated Motion. Section 5.4.2 presents primary frames with a focus on Path primary frame. Section 5.4.3 will focus on three basic frames under Path primary frames.

5.5.2 Layer 1: Archiframe of Self-initiated Motion

According to Liu and Chiang (2008), the Archiframe (AF) is the highest frame in the hierarchical framing system. It points out a unique and independent semantic domain of an event, in this case, the Self-initiated Motion. The archiframe defines an overarching conceptual schema as a semantic prerequisite for illustrating subframes that inherit. The information regarding the Archiframe of Self-initiated Motion is described below:

Definition: A conceptually moving entity (Figure) moves by adopting a particular way of movement (Manner) on a stationary site (Ground) or a certain course of motional path, passing an intermediate landmark (Route NP) toward a spatial orientation (Directional NP) to

arrive at a final destination (Locative NP) in relation to an optional marking of speaker-oriented center (Deictic).

Representitive lemmas: *fēi* 飛 'fly', *zǒu* 走 'walk', *guò* 過 'pass', *yuè* 越 'go over', *xiàng* 向 'face', *wǎng* 往 'face', *sheng* 升 'ascend', *jiàng* 降 'descend', *shàng* 上 'go up', *xià* 下 'go down', *jìn* 進 'enter', *huí* 回 'return', *jiàng-luò* 降落 'descend to fall', *luò-jiàng* 落降 'fall to descend', *shàng-sheng* 上升 'go up to ascend', *shàng-sheng* 升上 'ascend to go up', *tuì-huí* 退回 'recede to return', *huí-tuì* 回退 'return to recede', *lái* 來 'come', *qù* 去 'go'

Frame Elements: Figure, Ground, Route NP, Directional NP, Locative NP, Deictic

Conceptual Schema:
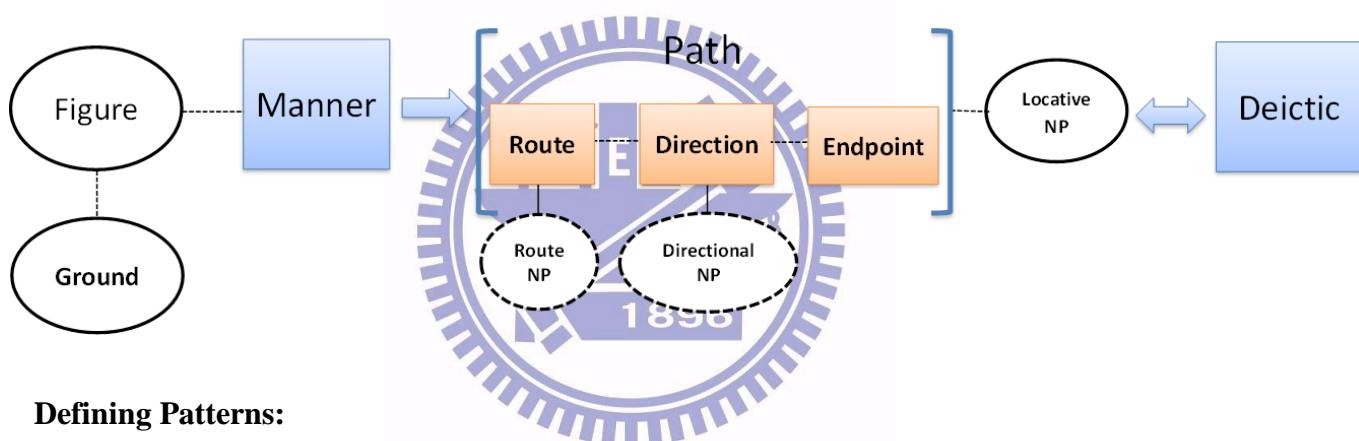
Defining Patterns:

a. Figure [NP] < * < Locative [NP] < Deictic [VP]

[洗衣房的大媽/Figure]趕快[滾回/Motion][老家/Locative][去/Deictic]吧！

xǐyīfang   de dàmā   gǎnkuài gǔn huí   lǎojiā   qù bā

the laundary room de elder.lady soon   roll return hometown go ba

'The cleaning ladies in the laundary room please return to their hometown soon.'

b. Figure [NP] < * < {到} + Locative [NP] < Deictic [VP]

[心/Figure]飛[到/Motion][日本/Locative][去/Deictic]了。

xīn fēi dào rìběn qù

Heart   fly arrive Japan   go

c. Figure [NP] < * < Deictic [VP] < Locative [NP]

[我們全體/Figure]都[跑/ Motion]去[操場/Locative]了

women   quántǐ   dōu pǎo   qù   cāochǎng   le

we   everyone all   run go   sports.ground ASP

'We all ran to the sports ground.'

5.5.3 Layer 2: Primary frame

As described by Liu and Chiang (2008), **Primary frames (PFs)** are subframes under the Archiframe with a given portion profiled or highlighted. Different primary frames are distinguished from one another by a set of unique core frame elements and syntactic representation. As Liu et al. (2012a) suggested self-initiated motion includes several semantically essential subportions: Manner, Path, and Deicitc. The Manner frame specifies the various ways of movement. The Path frame describes the course of motion with three subcategories: Route as specifying unique motional contour, Direction as specifying directional orientation of the movement, and Endpoint as specifying the arrival of final destination. The last one is the Deictic frame depicting the speaker-oriented relation in motion as toward or away from the speaker. The three primary frames under the Archiframe of Self-initiated Motion can be summarized as follows.
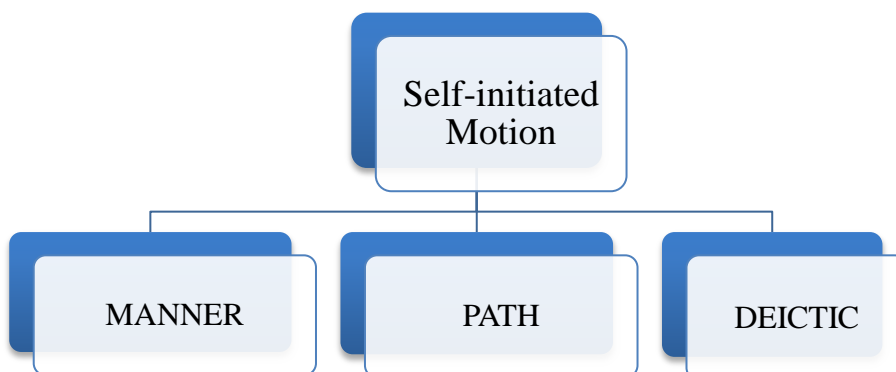
Figure 10: Primary Frames under Self-initiated Motion Archiframe

Information of Path primary frame will be provided in section 5.2.2.1. Since the other two primary frames Manner Frame and Deictic Frame[6] are not the main concern of this study, both of them will not be discussed for the time being.

5.5.3.1 Layer 2: Path Primary Frame

Definition: It is a motional course in which the moving entity (Figure) moves by passing an intermediate landmark (Route NP) toward a spatial orientation (Directional NP) to reach a final destination (Locative NP).

Representative lemmas: *guò* 過 'pass', *yuè* 越 'go over', *xiàng* 向 'face', *wǎng* 往 'face', *sheng* 升 'ascend', *jiàng* 降 'descend', *shàng* 上 'go up', *xià* 下 'go down', *jìn* 進 'enter', *huí* 回 'return', *jiàng-luò* 降落 'descend to fall', *luò-jiàng* 落降 'fall to descend', *shàng-sheng* 上升 'go up to ascend', *shàng-sheng* 升上 'ascend to go up', *tuì-huí* 退回 'recede to return', *huí-tuì* 回退 'return to recede.'

Core Frame Elements: Figure, Route NP, Directional NP, Locative NP

Conceptual Schema:
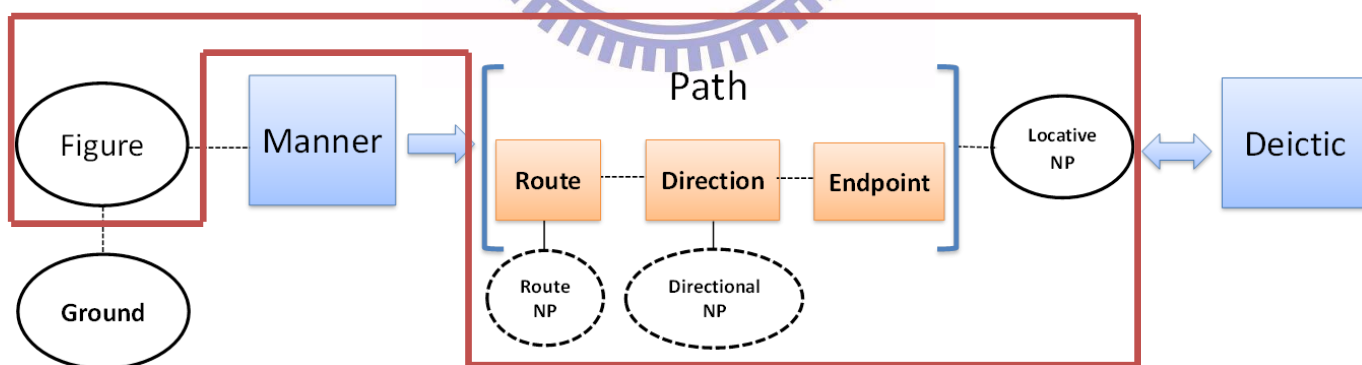
Definiting Patterns:

a. Figure [NP] < *

[飛機/Figure][降落/Path]了。

fēijī   jiàng-luò   le

---

[6] Please refer to Chen (2013) for detailed discussion on Deictic Primary Frame.

plane   descend-fall   ASP

'The plane has landed on.'

b.   Figure [NP] < * < Locative [NP] < (Deictic [VP])

[北韓警備艇/Figure]悄然[退回/Path][北方水域/Locative]，

běihán   jǐngbèiting   qiǎorán tuì-huí   běifang shuǐyù

North Korea   destroyer   quietly   recede-return northern waters

'The destroyers of North Korea secretly returned to the northern waters.'

c.   Figure [NP] < * < Route [NP] < {到}+Locative [NP]

[這裡的燕子/Figure]會飛[過/Path][大海/Route NP]到[南洋/Locative]去過冬。

zhèlǐ de yànzi   huì fēi guò dàhǎi dào   nányang   qù guò   dōng

here de swallow can fly pass ocean arrive Southerneast.ocean go spend winter

'These swallow will spend their winder at the Southern East Pacific Ocean.'

d.   Figure [NP] < * < Directional [NP] < {到}+Locative [NP]

幫助[台灣的流浪犬/Figure]飛[往/Path][美國/Directional NP]到[新的家庭/Locative]

bangzhù táiwān de liúlàng quǎn fēi   wǎng   měiguó dào   xīn de jiāting

help   Taiwan de stray   dog   fly   toward US   arrive new de family

'Let's help those stray dogs of Taiwan find their new families at US.'

5.5.4 Layer 3: Basic frame (Multi-faceted Motion Sequences)

Basic frames are sets of semantically restricted frames under primary frame, denoting a narrower scope of meaning. According to Liu and Chiang (2008), basic frames are "semantically more informative, distributionally more frequent and common, and are associated with foregrounded or backgrounded frame elements within the set of primary-selected elements." (Liu and Chiang 2008:10). To be specific, basic frames are defined by a set of highlighted frame elements inheriting from primary frames as well as

distinctic syntactic behaviors. To distinguish one from another, basic frames have their own defining patterns that foreground certain frame elements. The definining patterns of basic frames in my concern are listed here as illustrating the specific frame differences.

Liu et al. (2012a) decomposed the notion of Path into three subparts: Route, Direction, and Endpoint. And these essential components can combine with each other as several semantic portions: [Route+Direction], [Direction+Endpoint], [Route+Direction+Endpoint]. Along the vein, verbs of motion may lexicalize different internal components as *fēi* 飛 'fly' with [Manner]. As Liu et al. (2012b) noted, motion verbs will have unique lexicalization patterns according to how they are linearized into motion sequences. These motion sequences encode three possible portions of the components as 降落 *jiàng-luò* 'descend to fall' with [Route+Direction], 上升 *shàng-sheng* 'go up to ascend' with [Direction], and 落下 *luò-xià* 'fall to go down' with [Route + Direction + Endpoint]. The uniqueness of this portion [Direction] refers to the lexicalization pattern by motion sequences, instead of the morphological makeups of separate morphemes. The semantic portions of [Route + Direction] and [Route + Direction + Endpoint] can be lexicalized into monomorphemic verbs of motion as well as bimorphemic motion sequences.

We have recognized those semantically related but separable portions by adopting Frame Semantics. They can be realized as seven basic frames under Path primary frames as shown below:
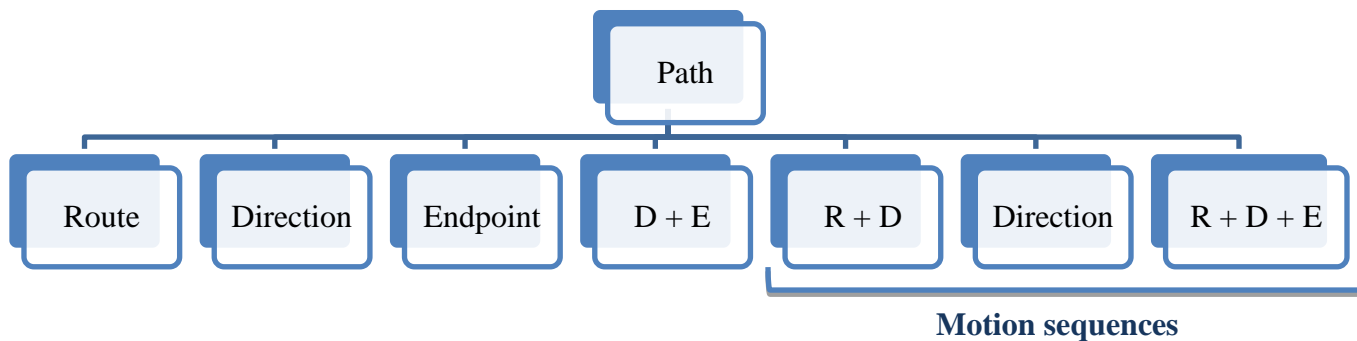
Figure 11: Basic Frames under Path Primary Frames

In this study, we will mainly investigate the multi-faceted motion sequences which belong to the three basic frames: [Route + Direction] frame, [Direction] frame, and [Route + Direction + Endpoint]. Other basic frames will be skipped for the time being.

5.5.4.1 [Route + Direction] frame

Definition: Motion sequences of [Route + Direction] frame describe a motion event specifying inherent Route and Direction information. In this frame, a foregrounded moving entity (Figure) adopts a way of movement (Manner) to arrive at a final destination (Locative).

Lemmas: *jiàng-luò* 降落'descend to fall', *luò-jiàng* 落降 'fall to descend'

tuì-luò 退落 'recede to fall', *luò-tuì* 落退 'fall to recede'

huí-sheng 回升'return to ascend', *huí-jiàng* 回降 'return to descend'

huí-tuì 回退 'return to recede', *huí-luò* 回落 'return to fall'

Core Frame Elements: Figure, Manner, Locative NP

Defining Patterns:

a. Figure [NP] < *

[飛機/Figure][降落/Motion R+D] 了

fēijī   jiàng-luò   le

plane   descend-fall   ASP

'The plane has landed on.'

b. Figure [NP] < * < Locative [NP] < (Deictic [VP])

[飛機/Plane][落降/Motion R+D][啟德機場/Locative]。

fēijī   luò-jiàng   qǐdéjīchǎng

plane   fall-descend   Kai.Tak.International.Airport

'The plane has landed on the Kai Tak International Airport.'

c. Figure < Manner [VP] < * < {到}+Locative [NP] < (Deictic [VP])

[兩枚/Figure]飛[降落/Motion R+D]到[其外圍/Locative]。

liǎng   méi   fēi   jiàng-luò   dào   qí   wài   wéi

Num   CL   fly   descend-fall   arrive   its   outer   area

'Two of them flew down to reach its outskirt.'

5.5.4.2 [Direction] frame

Definition: Motion sequences of [Direction] frame describe a motion event specifying inherent Direction information. In this frame, a foregrounded moving entity (Figure) arrives at a final destination (Locative).

Lemmas: *shàng-sheng* 上升 'go up to ascend'*, xià-jiàng* 下降 'go down to descend'

xià-luò 下落 'go down to fall'*, xià-tuì* 下退 'go down to recede'

Core Frame Elements: Figure, Locative NP

Defining Patterns:

a. Figure [NP] < * < {到}+Locative [NP] < (Deictic [VP])

[立正站好的熱氣球/Figure]，緩緩[上升/Motion D]到[空中/Locative]，

lìzhèngzhànhǎo   de   rèqìqiú   huǎnhuǎn   shàng-sheng   dào   kōngzhōng

stand still   de   balloon   slowly   ascend   arrive   sky

'The balloon standing still go up to sky slowly. '

[雨水/Figure][下降/Motion D]到[地面/Locative]，

yǔshuǐ   xià-jiàng   dào   dìmiàn

rain   go.down to descend   arrive   ground

'The rain went down to the ground.'

5.5.4.3 [Route + Direction + Endpoint] frame

Definition: Motion sequences of [Route + Direction + Endpoint] frame describe a motion event specifying inherent Route, Direction, and Endpoint. In this frame, a foregrounded moving entity (Figure) arrives at a final destination (Locative) or a speaker-oriented center (Deictic).

Lemma: *tùi-xià* 退下 'recede to go down'**,** *luò-xià* 落下 'fall to go down'、

       sheng-shàng 升上 'ascend to go up'**,** *jiàng-xià* 降下 'descend to go down'、

       sheng-huí 升回 'ascend to return'**,** *jiàng-huí* 降回 'descend to return'、

       luò-huí 落回 'fall to return'**,** *tùi-huí* 退回 'recede to return'

Core Frame Elements: Figure, Locative NP, Deictic

Defining Patterns:

a.   Figure [NP]< * < Locative [NP] < (Deictic [VP])

    [十五的月亮/Figure][升上/Motion R +D + E] 了[天空/Locative NP]。

    shíwǔ   de   yuèliàng sheng-shàng le   tiānkōng

    fifteen   de   moon   ascend-go.up ASP   sky

    'The moon has risen up to the sky.'

b.   Figure [NP] < * < {到}+Locative [NP] < (Deictic [VP])

    [星星/Figure][落下/Motion R+D+E]到[地面/Locative]，

    xīngxīng   luò-xià   dào   dìmiàn

    Stars   fall-go.down   arrive ground

    'Stars fall down on the ground'

c.   Figure [NP] < * < Deictic [VP] < Locative [NP]

    如果[你們/Figure]不願保健康險就請[退回/Motion R+D+E][去/Deictic][聖彼得堡/Locative]

    rúguǒ nǐmén bú   yuàn bǎo jiànkāngxiǎn   jiù qǐng tùi-huí   qù

    if   you   Neg willing buy health.insurance jiu please recede-return go

shengpīdebǎo

Saint-Petersburg

'Please return to Saint-Petersburg if you're not willing to pay the heath insurance.'

5.5.4.4 Summary of Basic Frames

Basic frame	Core Frame Elements	Lemmas	Defining Patterns
Route + Direction	Figure, Manner Locative NP	降落、落降 退落、落退 回升、回降 回退、回落	a. Figure [NP] < * [飛機/Figure][降落/Motion R+D]了 b. Figure [NP] < * < Locative [NP] < (Deictic [VP]) [飛機/Plane][落降/Motion R+D][啟德機場/Locative]。 c. Figure < Manner [VP] < * < {到}+Locative [NP] <(Deictic[VP]) [兩枚/Figure]飛[降落/Motion R+D]到[其外圍/Locative]。
Direction	Figure, Locative NP,	上升、下降 下落、下退	a. Figure [NP] < * < {到}+Locative [NP] < (Deictic [VP]) [立正站好的熱氣球/Figure],緩緩[上升/Motion D]到[空中/Locative],
Route + Direction + Endpoint	Figure, Locative NP, Deictic	退下、落下 升上、降下 升回、降回 落回、退回	a. Figure [NP]< * < Locative [NP] < (Deictic [VP]) 十五的月亮/Figure][升上/Motion R +D + E]了[天空/Locative NP]。 b. Figure [NP] < * < {到}+Locative [NP] < (Deictic [VP]) [星星/Figure][落下/Motion R+D+E]到[地面/Locative], c. Figure [NP] < * < Deictic [VP] < Locative [NP] 如果[你們/Figure]不願保健康險就請[退回/Motion R+D+E][去/Deictic][聖彼得堡/Locative]

Table 15: Summary of Basic Frames

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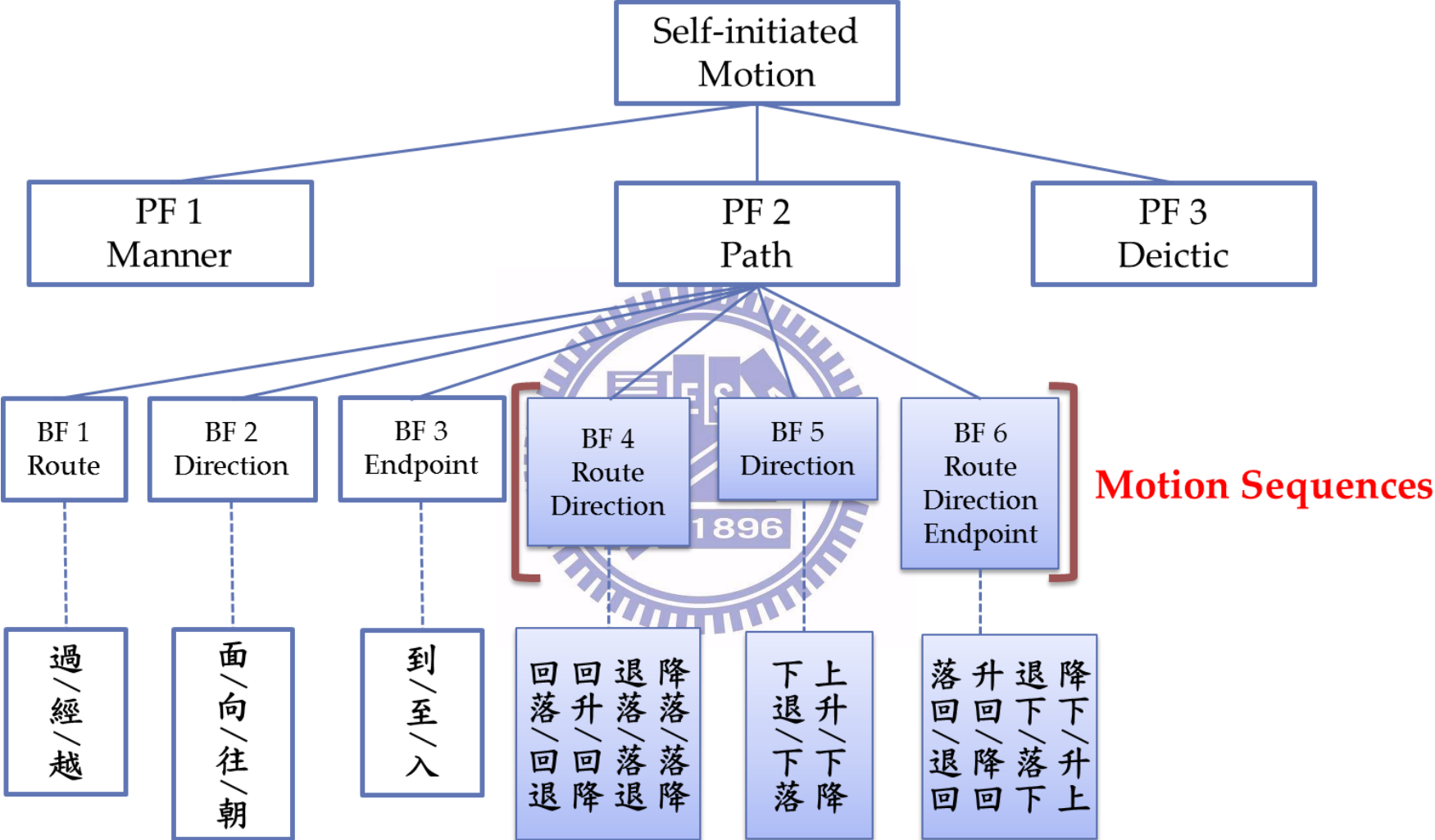**5.5.4.5 Hierarchical Structures of Self-initated Motion**

Figure 12: Hierarchical Structures of the Self-initiated Motion

Chapter 6
Conclusion and Further Research

6.1 Conclusion

This paper probes into the issue of alternated motion sequences in Mandarin Chinese. By investigating how verbs of motion are sequenced and their lexicalization patterns, we aim to account for the sequenctial mechanism that governs the alternation of linearizing motion verbs. The first question we have tackled is that *what is the distributional pattern in between alternated Mandarian motion sequences?* A thorough inspect on distributional frequency of alternated motion sequences suggests that conformed and reveserd motion sequences are skewed to unequal distributional patterns as a result of competitional effect or labor division for event types.

To set up the scope of alternated motion sequences, we overlooked verbs of motion plotted on the Deictic-Incorporated Pro-Motion Event Schema by Liu et al. (2012a) and exhausted all possible motion sequences that are allowed for sequential alternation. The scope of the thesis is hence set up by focusing on the ten pairs of alternation motion sequences. A close examination on their collocational variation as well as their interaction with Mandarin aspectual markers by investigating their lexicalization patterns with internal semantic components helps account for the following concern: *what are the collo-constructional variations between alternated motion sequences in each pairs*?

Since form and function are learned pairings in languages according to Constructional Grammer (Goldberg 1995), alternated sequences of Mandarin motion verbs will be linked to their corresponding semantic functions. As proposed in Chapter 5, Mandarin motion sequences can be suggested to have a spatial and non-spatial distinction on event types as manifested by their linearizing fashion as conformed or reversed sequence. We claim that verbs of motion in conformed sequence have a tendency to predicate spatial motion events while motion sequences in reversed order are prone to non-spatial predication of motion. Utimately we attempt to postulate the sequential mechanism that governs the alternation of Mandarin motion sequences. That is to say, *what is the semantic function associated with morphological alternation?*

Finally we adopted the frame-based analysis to establish the hierarchical classification of motion sequences, the theory of Frame semantics (Fillmore and Atkins 1992) and the hierarchical taxonomy by Liu and Chiang (2008). This study presents a top-down frame-based

classification of Mandarian motion sequences. Based on an overarching conceptual schema, Mandarin motion sequences are analyzed and categorized into different layers of frames with profiled frame elements (i.e. Primary frame), unique patterns foregrounding certain elements (i.e. Basic frame), and the internal lexical attributes (i.e. Microframe).

Untimately, the present paper attempts to shed some light on the widely discussed issue of motion sequences with a focus on their sequential alternated sequences. Adopting the frame-based analysis, we explore the collo-constructional interrelation in between the the alternated motion sequence and their co-ocurring participant roles, which specifies the syntax-to-semantic correlation as evidenced in our observation from corpus data. By revealing and investigating the intriguing alternated motion sequences, we aim to account for the compositional mechanism of alternated motion sequences by investigating the semantic-to-morphological correlation. We attempt to postulate how the morphological forms can be matched with semantic predication of spatial and non-spatial uses.

6.2 Further Research

There are some potential issues worth exploring in the future for theoretical implications. First, the thesis mainly tackles alternated motion sequences predicating self-initiated motion without considering other-initiated motion events. It is noted that some motion sequences in discussion may pertain to dual motion that exhibits an alternation between self-initiated and other-initiated usages. See *jiàng-xià* 降下 'descend to go down' for example.

(76) a. 黃山風景區**降下**了[入冬以來第一場大雪/Moving Entity]。

b. 美軍**降下**[國旗/Moved Entity]。

By observing the participants roles co-ocurring with motion sequences, we suggest that (75a) is a self-initiated motion with a moving entity *dà.xuě* 大雪 'heavy snow' taking motion by itself. (75b) expresses a other-initiated motion event with a moved entity *guóqí* 國旗 'national flag.' In addition to *jiàng-xià* 降下 'descend to go down', many motion sequences like *sheng-shàng* 升上 'rise to go up' and *luò-xià* 落下 'fall to go down' are also found to denote dual motion events. This unique set of motion verbs or sequences can be another noteworthy issue to explore that may shed some light on the interrelation between both self-initiated and other-initiated motion.

Secondly, the cognitive mechanism in which a spatial   motion event is metaphorically extended to non-spatial usages as well as the semantic properties defining a non-spatial event have not yet been investigated so far. How can one determine a given motion event is predicating spatial or non-spatial usages? It goes without saying that many essential issues regarding verbs of motion and their sequential order in Mandarin are not yet investigated at this point. The goal of this thesis, however, aims to provide the semantic-to-morphological interrelation in aid of a frame-based analysis so as to bring about more interests on Mandarin serial motion constructions.

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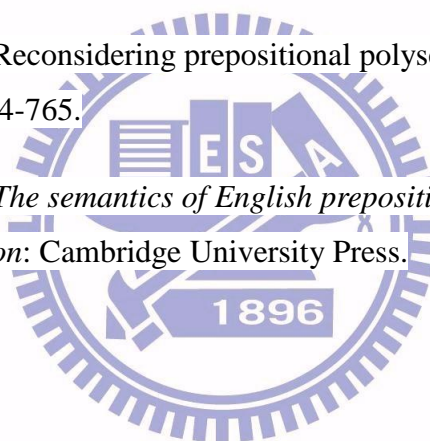
Web Resources:

1. Academia Sinica Balanced Corpus of Modern Chinese
   (http://db1x.sinica.edu.tw/kiwi/mkiwi/)
2. Chinese Word Sketch
   (http://wordsketch.ling.sinica.edu.tw/)
3. Goolge Search
   (http://www.google.com)
4. FrameNet
   (http://framenet.icsi.berkeley.edu/)
5. Mandarin VerbNet
   (http://140.113.222.78/verbnet/website/)