TEMPORAL SEQUENCE AND CHINESE WORD ORDER*

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1. Introduction

Grammatical relations among syntactic units can, in general, be coded by means of inflectional change of words, auxiliary words and word order. It is a well-known fact that being a non inflectional language, Chinese relies heavily, if not totally, upon auxiliary words and word order in its grammatical system. Insofar as word order is concerned, it has been observed by a number of Chinese linguists that word order carries more semantic functions in this language than in an inflectional language. For example, the meaning contrast between the preverbal and the postverbal position for a noun phrase with regard to definiteness was observed by Mullie (1932), discussed in Chao (1968), examined in much more detail in Li (1971) and in Teng (1975a), and recently generalized with refinements in Li and Thompson (1975b). Another example can be found in Tai's (1973, 1975) investigation on the meaning contrast involving adverbials between the preverbal and the postverbal position. These two lines of research seem to have reached a common point in Light (1979), who observes that the meaning of nouns and adverbs depends on their location before or after the main verb. While Light's observation is interesting and basically correct, it is too vague to serve as a principled generalization with explanatory values. Particularly, the meaning contrast involving adverbials needs to be further scrutinized as to its nature and manner of application in different kinds of adverbials. In this paper, we attempt to understand the meaning differences between preverbal and postverbal adverbials in terms of the notion of temporal sequence, and to provide an explanation for their placement by the principle of temporal sequence. By appealing to temporal sequence, we have a way to better understand the common point observed by Light.
2. **The Principle of Temporal Sequence as Independently Motivated**

The principle of temporal sequence (henceforth PTS) can be stated as: the relative word order between two syntactic units is determined by the temporal order of the states which they represent in the conceptual world.

PTS is independently motivated by several facts in Chinese word order. When two Chinese sentences are conjoined by temporal connectives such as zài, jiù and cái 'then', the first sentence always precedes the second sentence. This can be illustrated by (1)-(3) sentences.

(1) \[ \text{wǒ chī guò fàn, nǐ zài dā diànhuà géi wǒ} \]
\[ S_1 \quad S_2 \]
\[ \text{Call me after I have finished the dinner.} \]
\[ S_2 \quad S_1 \]

(2) \[ \text{wǒmen gōngzuò yì jiéshù, tā jiù lái-le} \]
\[ S_1 \quad S_2 \]
\[ \text{He came over as soon as we finished the work.} \]
\[ S_2 \quad S_1 \]

(3) \[ \text{nǐ gěi tā qián, tā cái géi nǐ shū} \]
\[ S_1 \quad S_2 \]
\[ \text{He won’t give you the book until you give him the money.} \]
\[ S_2 \quad S_1 \]

The Chinese conjoined sentences would be ungrammatical if \( S_2 \) were ordered before \( S_1 \). Their translations show that English conjoined sentences need not obey PTS. Similarly, when two Chinese predicates are linked by temporal connectives, they observe PTS. For instance,

(4) \[ \text{wǒ chī guò fàn zài dā diànhuà géi nǐ} \]
\[ P_1 \quad P_2 \]
\[ \text{I will call you after finishing the dinner.} \]
\[ P_2 \quad P_1 \]

(5) \[ \text{Lǐ xiǎojie chī-le bān wǎn fàn jiù bǎo-le} \]
\[ P_1 \quad P_2 \]
\[ \text{Miss Li was full after eating just half a bowl of rice.} \]
\[ P_2 \quad P_1 \]

(6) \[ \text{nǐ gěi-le wǒ qián cái néng zǒu} \]
\[ P_1 \quad P_2 \]
\[ \text{You can’t leave until you give me the money.} \]
\[ P_2 \quad P_1 \]
Again, the English translations show that PTS doesn’t apply in English.

The principle also holds true in serial verb constructions, where no overt connectives exist. Thus, when two verbal phrases express consecutive actions, they are ordered according to their temporal order in the conceptual world. For example, while (7a) is grammatical, (7b) is not.¹

(7)  a. Zhāngsān shàng-lóu shuì-jíào  
VP₁     VP₂  
John went upstairs to sleep
b. * Zhāngsān shuí-jíào shàng-lóu  
VP₁     VP₂

Furthermore, two verbal phrases can have either order with different interpretations in temporal sequence. For example,

(8) Zhāngsān dào tūshūguān ná shū  
VP₁     VP₂  
John went to the library to get the book.

(9) Zhāngsān ná shū dào tūshūguān  
VP₁     VP₂  
John took the book to the library.

Li and Thompson (1973) have correctly observed that sentences like (10a) have an “alternating” reading in that the actor goes back and forth between two different kinds of activities.

(10)  a. Zhāngsān tiāntiān huì-kè xiě-xìn  
Every day John both receives guests and writes letters.
b. Zhāngsān tiāntiān xiě-xìn huì-kè

Since a serial verb construction with the alternating reading doesn’t involve temporal sequence, it can have both orders without difference in meaning triggered by the difference in temporal sequence. Thus, (10b) is grammatical and synonymous. It is consistent with the fact that when no temporal sequence is involved, both orders are grammatical with no difference in meaning for two conjoined elements.²

Li and Thompson (1973) also discussed purposive and simultaneous readings in serial verb constructions, in addition to consecutive and alternating readings which we have just mentioned. Obviously in purposive expression, the action temporally precedes the purpose to be realized in time and therefore word order. Thus, (11a) is grammatical, but not (11b).
(11) a. wōmen kāi-huí jiējué wèntí
   1           2
   We are holding a meeting to solve the problem.

b. * wōmen jiējué wèntí kāi-huí
   2           1

They further claimed that sentences like (12a) express simultaneous actions.

(12) a. Zhāngsān qí jiāotāche zòu-le
   1           2
   John left riding his bike.

b. * Zhāngsān zòu-le qí jiāotāche
   2           1

By PTS, if Li and Thompson were correct, (12) should have allowed both orders just as (10) does. However, it seems clear that in our conceptual world, one has to ride his bike first before he has left a place by riding on a bike. Therefore, it is doubtful that sentences like (12) really express simultaneous actions.³ Native speaker intuition suggests that genuine simultaneous actions are expressed in Chinese by the conjunctive expression yì biānr — yìbiānr, in which the two sequences are both grammatical and equivalent in meaning.⁴ For example,

(13) a. tā yìbiānr zòu-lù yìbiānr kàn-shū
   He was reading while walking.

b. tā yìbiānr kàn-shū yìbiānr zòu-lù

PTS is also necessitated by the action-result pattern in Chinese verb compounds. While the application of this principle is self-explanatory, its impact on the structure of the Chinese language can be appreciated better if one compares several general differences between Chinese and English verb patterns. The achievement of a goal is implicit in English verbs like ‘to build’ and ‘to find’.⁵ Their Chinese equivalents are verb compounds of the action-result type, e.g., gài-hào ‘build-finished’ and zhāo-dào ‘search-reach’, and not just gài and zhāo, which do not imply the attainment of a goal. Chinese uses resultative verb compounds such as dā-pò ‘hit-break’ and dā-sí ‘hit-die’ to express the transitive verbs ‘to break’ and ‘to kill’. Similarly, the Chinese verb compounds kàn-dòng ‘read-understand’ and tīng-dòng ‘listen-understand’ express ‘to understand’. In English, perceptual verbs such as ‘to see’ and ‘to hear’ have no morphological similarity to their corresponding actions verbs, i.e., ‘to look’ and ‘to listen’. In Chinese, however, kàn-jian
‘to see’ is built with kàn ‘to look’ while tīng-jian ‘to hear’ with tīng ‘to listen’. Chinese doesn’t have a verb class corresponding to the English class represented by ‘to manage’ and ‘to persuade’. The meaning of ‘attempt’ and ‘attainment of goal’ in this class of English verbs is expressed by shè-fā ‘to plan methods’ followed by a resultative verb compound. For example, ‘to manage to find’ in Chinese is shè-fā zhǎo-dào ‘to plan ways to search-reach’, which in fact represents three states in accordance with their temporal sequence. Similarly, PTS accounts for the Chinese word order in (14) and (15).

(14)  tā niàn-wǎn-le zhèi běn shū
1  2  3
    He has finished reading this book.
      3  2  1

(15)  tā zuò-chéng -le zhèi jiàn gōngzuò
1  2  3
    He has succeeded in doing this job.
      3  2  1

It can be seen from (14) and (15) that while in ordering niàn-wǎn-le and zuò-chéng-le follow the natural temporal sequence of action-result, their English equivalents do not.

We have shown that PTS is independently motivated by the word order phenomena in conjoined sentences and predicates, serial verb phrases, and verb compounds in Chinese. The syntactic units in question refer to events or actions in the conceptual world and by PTS are ordered according to the temporal sequence of the events or actions they represent.

3.  PTS and Adverbial Placement

PTS can be extended to account for some interesting phenomena in Chinese adverbial placement. Consider the position of directional locatives as illustrated in (16) and the meaning contrast between (17) and (18).

(16)  a.  tā cóng Zhōngguó lái
       He came from China

       b.  * tā lái cóng Zhōngguó

(17)  tā zuótiān dào Méiguó lái
       He left for the United States yesterday
(18) tā zuótiān lái dào Mèiguó
He arrived in the United States yesterday

(16) shows that the ‘from’ phrase can only occur before the verb. By PTS, a plausible explanation is that the ‘from’ phrase specifies a starting point and therefore a state before that of action. This is supported by the fact that cōng ‘from’ is etymologically a verb. (17) and (18) show that when the ‘to’ phrase occurs before the verb, it indicates a projected goal, but when it occurs after the verb, it refers to a reached goal. In terms of temporal sequence, moving toward some place precedes the state of arriving at some place, while arriving at some place follows moving. This kind of interpretation is supported by the fact that dào can be used as a main verb as in tā dào le ‘he has arrived’, and the fact that the dào phrase in (17) and (18) is more like a verbal phrase than a prepositional phrase.

The meaning contrast induced by different order of the dào phrase can be seen most clearly when it interacts with conveyance expressions. For example,

(19) tā zuò gōnggōng qìché dào zhèr

He came by bus.

(20) tā dào zhèr zuò gōnggōng qìché

He came here to ride in a bus.

In (19), riding in a bus precedes getting here. However, the reverse is true in (20).

The word order of sentences involving both directional locatives and conveyance expressions follows from the principle as well. Thus, the word order in (21) cannot be changed without affecting the meaning.

(21) tā cōng San Francisco zuò greyhound bus from ride

jīngguò Chicago dào New York pass arrive

He came to New York from San Francisco

through Chicago by greyhound bus.
PTS also applies to the comparative constructions. Obviously two persons have to be compared before we can find out which one is taller. Thus, (22a) is grammatical, but not (22b).

(22) a. tā bǐ wǒ gāo
   1 2
   He is taller than me.

   b.* tā gāo bǐ wǒ
      2 1

Similarly, when two events are compared with respect to manner or degree, they are first compared before the result is known. Thus,

(23) a. tā shuō Zhōngguó huà bǐ wǒ shuō Rìběn huà shuō de hǎo
   1 2 3
   He speaks Chinese better than I speak Japanese.

   b.* tā shuō Zhōngguó huà shuō de hǎo bǐ wǒ shuō Rìběn huà
      1 3 2

PTS explains the word order of the prepositional phrases which are placed before the verb. For example,

(24) a. tā wàng nán kàn

   b.* tā kàn wàng nán
   He looked towards the south.

It is necessary for one to face the south before he can look toward the south. The same explanation applies to other pre-verbal prepositional phrases. Thus,

(25) a. tā dū wǒ shuō

   b.* tā shuō dū wǒ
   He said to me.

(26) a. tā gēn wǒ qù

   b.* tā qù gēn wǒ
   He went with me.

Some prepositions take the aspect marker zhe and may still be ordered before the main verb. For example,

(27) tā dū-zhe wǒ xiào
   He was smiling to me.

In this case, we have a meaning contrast between (27) and (28).
(28)  

\[ \text{tā xiào-zhe dui wò} \]

He faced me smiling.

It is clear that the meaning contrast between (27) and (28) is explained by PTS.  

This principle also applies to manner and instrumental adverbs. For these adverbs, the preverbal position is used to describe one particular event, while the postverbal position is used for general statement. This is exemplified by (29)-(32) sentences.

(29)  

a.  
\[ \text{tā hěn kuài de pāo-le} \]

b.  
\[ \text{* tā pāo-le de hěn kuài} \]

He ran away very quickly.

(30)  

a.  
\[ \text{tā pāo de hěn kuài} \]

b.  
\[ \text{* tā hěn kuài de pāo} \]

He runs fast.

(31)  

a.  
\[ \text{tā yòng kuàizi chī-le nèi wǎn fàn} \]

b.  
\[ \text{* tā chī-le nèi wǎn fàn yòng kuàizi} \]

He ate that bowl of rice with chopsticks.

(32)  

a.  
\[ \text{tā yòng kuàizi chī fàn} \]

He eats meals with chopsticks.

b.  
\[ \text{tā chī-fàn yòng kuàizi} \]

The sentence (29) describes a particular event at a specific time. It can be paraphrased as ‘he took a very quick action to run away’ In other words, at a specific point of time and in a quick manner, the actor performed the action of ‘running away’. The moment before the action of ‘running away’ took place, he had to initiate this action quickly. Thus, the state of initiating an action quickly precedes the performance of the action. By PTS, the syntactic unit ‘very quick’ has to be placed before ‘to run away’. Sentence (30) is a general statement regarding the quality of ‘run’ and need not be bound by a particular event at a specific time. There is some syntactic evidence which suggests that in sentence (30) while ‘run’ is a presupposition, ‘fast’ is a focus. In terms of temporal sequence, presupposition precedes focus. In terms of word order, the syntactic unit ‘run’ is therefore placed before the syntactic unit ‘fast’. Similarly, (31) refers to a particular event at a specific time. Since one first has to use chopsticks before one can eat with chopsticks, by PTS, the instrumental phrase therefore has to be ordered before the verb. In contrast with (31), (32) is a general statement. The word order of (32a)
can be explained by viewing yòng kuàizi ‘to use chopsticks’ as the presupposition and chī fàn ‘to eat’ as the focus of this sentence. (32b) appears to have a topic-comment structure, with tā chī fàn ‘he eats’ as the topic and yòng kuàizi ‘use chopsticks’ as the comment. In terms of temporal sequence, topic precedes comment and is ordered accordingly.

The proposed principle explains another word order phenomenon of manner adverbs. For manner adverbs describing mental states of actors, the preverbal position indicates that the mental state both precedes the initial point and accompanies the action as well. The postverbal position, however, indicates that the mental state comes to exist only after the action has taken place. For example, in (33), the adverbial ‘very happy’ expresses the state of mind in which the actor has performed the action. It may also be the state of mind which the actor has assumed even before the action takes place. Thus, the unit ‘very happy’ precedes the unit ‘to play’ in temporal sequence and by PTS in word order as well. (34) describes a state of mind ‘very happy’ as resulting from the action ‘to play’. Its word order also follows from PTS. Thus, PTS accounts for different word order in (33) and (34) and their meaning contrast as well.

(33) tā hěn gāoxìng de wány ēr
He is playing very happily.

(34) tā wány ēr de hěn gāoxìng
He is very happy from playing.

I have elsewhere (1975) proposed to understand the placement of zài locative adverbials in Mandarin Chinese by the generalization that while a preverbal locative denotes the location of an event, a postverbal locative denotes the location of a participant as the result of an event. Thus, since the function of the locative ‘in the kitchen’ in (35) is to indicate the location where the event ‘he cooked’ took place, it must occur before the verb. In contrast, since the locative ‘in the water’ in (36) specifies the location of the actor (or patient) as a result of the action ‘fall’, it can only be placed after the verb.

(35) a. tā zài chūfāng-li zuòfàn
b.* tā zuòfàn zài chūfāng-li
He cooked in the kitchen.

(36) a. tā diào zài shuǐ-li
b.* tā zài shuǐ-li diào
He fell in the water.
My previous proposal for the placement of locatives also accounts for the semantic contrast between minimal pairs involving the placement of zài phrase.

(37)  xiǎo hóuzi zài mábēi-shang tiào
The little monkey was jumping on the horse’s back.

(38)  xiǎo hóuzi tiào zài mábēi-shang
The little monkey jumped on the horse.

Although I believe that my previous generalization regarding zài phrases is not incorrect, it does not answer a deeper question of why Chinese should have different word orders for two different types of locatives or the question of why it is the preverbal position rather than the postverbal position which specifies the location of the event. However, in terms of temporal sequence, the state of ‘in the kitchen’ starts before the state of ‘to cook’. By PTS, it must be ordered before the verb. In (36), the state of ‘to fall’ precedes and ends before that of the locative ‘in the water’. By PTS, (36a) is acceptable, but not (36b). Similarly, since the state ‘on the horse’s back’ in (37) starts before the action, the word order is in accordance with PTS. In contrast, in (38), the state of the action obviously precedes the state of the locative, the word order in (38) therefore observes PTS.9

In Chinese, duration adverbs can only occur after the verb. For instance,

(39)  a. tā bìng-le sān tiān le
He has been sick for three days.

b.*ta sān tiān bìng-le

c.*sān tiān tā bìng-le

In (39), the initial point of the state ‘he has been sick’ precedes that of ‘three days’, for the sentence purports to tell how long ‘he has been sick’ after he first became sick. The temporal sequence exhibits even more clearly in sentences like (40).

(40)  a. tā zhōu-le sān tiān le
He has been gone for three days.

The duration adverb ‘three days’ in (40) obviously refers to the time span from the moment he left to the moment this sentence is uttered. This sentence doesn’t necessarily mean that he has been walking for three days. Two pieces of supporting evidence can be found for this kind of analysis. First, yǐjīng ‘already’ or yǒu ‘have’ or both can occur between the main verb and the duration adverb. Thus,
(41) a. tā bìng-le yǐjīng sān tiān le  
    b. tā bìng-le yǒu sān tiān le  
    c. tā bìng-le yǐjīng yǒu sān tiān le  
    He has been sick for three days already.

Second, when the main verb takes an object, the main verb has to be repeated before the duration adverb. For instance,

(42) a. tā kàn shū kàn-le sān tiān le  
      1  2  3  
      He has been reading for three days.  
    b.* tā kàn shū sān tiān le

(43) a. tā shēng bìng shēng-le sān tiān le  
      1  2  3  
      He has been sick for three days.  
    b.* tā shēng bìng sān tiān le

Huang (manuscript) has correctly observed that there seems to be an iconic element to the syntactic phenomenon in that the repetition of the verb may be said to mirror the dragging of an activity or a process associated with the verb. In terms of temporal sequence, this kind of sentence can be analyzed as consisting of three parts temporally ordered with the first part indicating initial point of an activity, the second part repetition of the activity, and the third part the final counting of the duration of the activity.

In Chinese, frequency adverbs also occur after the verb. For instance,

(44) a. tā lái-le sān cì  
    He has come three times.  
    b.* tā sān cì lái-le  
    c.* sān cì tā lái-le

(45) a. wǒ dǎ-le tā sān cì  
    I hit him three times.  
    b.* wǒ sān cì dǎ-le tā  
    c.* sān cì wǒ dǎ-le tā

PTS can account for the word order of frequency adverbs in the same manner as it does for duration adverbs, since frequency adverbs exhibit almost the same syntactic behaviors as duration adverbs. The only difference lies in the fact that in the case of frequency adverbs, the verb with an object need not be repeated as illustrated in (45). However, it is not ungrammatical to repeat the verb. Thus,
This difference can be explained more naturally by the notion of temporal sequence than by other arbitrary syntactic mechanisms. For if the rule of verb repetition has an iconic element in it, the duration adverb more than the frequency adverb gives a picture of the dragging of an activity.

Finally, resultative and extent complements (or adverbs) are ordered after the verb. For instance,

(47) a. tā pāo lèi-le
    He is tired from running.
   b. * tā lèi pāo-le

(48) a. tā lèi de bù néng shuō huà le
    He is so tired that he cannot speak.
   b. * tā bù néng shuō huà de lèi le

Obviously, in terms of temporal sequence, they follow the verb. By PTS, they are ordered after the verb.

To sum up, we have shown that PTS provides systematic explanations for a large number of word order phenomena involving verb-adjunct phrases which are traditionally categorized as adverbs. These phenomena have hitherto been considered as unrelated facts. They include (1) the placement of locative adverbials which has previously been accounted for by Tai’s (1975) semantic principle, (2) the placement of the class of adverbial phrases which have been identified as ‘co-verb’ phrases, (3) the placement of instrumental and manner adverbs, (4) the placement of duration and frequency adverbs, (5) the placement of resultative and extent adverbial complements, (6) the meaning differences between the preverbal and the postverbal position in regard to locative and manner adverbs.10

4. The Principle of Temporal Scope

Some word order phenomena involving time expressions can be explained better in terms of the notion of temporal scope rather than temporal sequence. The principle of temporal scope (henceforth PTSC) can be stated as: if the conceptual state represented by a syntactic unit X falls within the temporal scope of the conceptual state represented by a syntactic unit Y, then the word order is YX.

PTSC requires that a constituent with smaller temporal range should
follow one with larger range. This is in fact part of an even more general principle in Chinese, that is, constituents with a larger scope precede those with a small scope in both time and space. This can be illustrated by (49) and (50), which represent the only acceptable orders in Chinese to report address and time respectively.  

(49) The United States, Illinois, Carbondale, University Avenue, 800.

(50) 1980 year, December, 22nd day, morning, 10 o’clock.

The explanatory value of PTSC can easily be seen from the fact that Chinese time adverbs and adverbial clauses can never occur after the verb. For example,

(51) a. tā zuótiān zǒu-le
   He left yesterday.

b. zuótiān tā zǒu-le

c.* tā zǒu-le zuótiān

(52) a. nǐ bù zài de shíhou, tā zǒu-le
   He left, when you were not here.

b.* tā zǒu-le, nǐ bù zài de shíhou

Since the temporal range of the action denoted by the verb is within the temporal range denoted by the time adverb, the verb is therefore within the temporal scope of the time adverb and by PTSC is placed after the time adverb.

We have mentioned in the previous section that duration and frequency adverbs occur after the verb. However, when they are attached by the universal quantifier dōu ‘all’, they define a temporal scope for the verb and can only occur before the verb.  

For example,

(53) a. tā sān tiān lái dōu bìng-zhe
   He has been sick during the past three days.

b. sān tiān lái tā dōu bìng-zhe

c.* tā dōu bìng-zhe sān tiān lái

(54) a. tā sān cì dōu shībài-le
   All the three times he failed.

b. sān cì tā dōu shībài-le

c.* tā dōu shībài-le sān cì.

In (53), both the initial and the ending point of the state ‘he has been sick’ are within the temporal range of ‘all the three days’, which like time expres-
sions such as zuótiān ‘yesterday’ and qǔnián ‘last year’, specifies a particular period of time in which an event occurs or a situation exists. Similarly, the frequency expression with dōù in (54) constitutes a temporal range in the sense that all the three times concerned he failed each time.⁷

The explanatory value of PTSC can be appreciated better in conjunction with the notion of logical scope. The extent and nature of its application needs further investigation. Since the main concern of this paper is with the notion of temporal sequence, for the present purpose, it suffices to point out that the temporal arrangement in Chinese word order involves basically two independently motivated principles, i.e., PTS and PTSC.

5. PTS and Noun Phrases

It is a well-known generalization in Chinese grammar that while nouns preceding the verb tend to be definite, those following the verb tend to be indefinite. This tendency obviously has to do with presupposition and anaphoricity. If we view presupposition and anaphoric reference from the viewpoint of time axis, PTS and the tendency are two sides of the same coin.

Y. C. Li (1976) has observed that while we normally say (55b) when talking about ‘writing’, we express it in the reverse order when talking about ‘erasing’ as in (56a).

(55) a.* tā bā héibānshàng-de zì xiě-le
    b. tā xiě zì xiě zài héibānshàng
       He wrote the words on the blackboard.

(56) a. tā bā héibānshàng-de zì cā-le
    b.* tā cā zì cā zài héibānshàng
       He erased the words on the blackboard.

As Y. C. Li has correctly observed, the presupposition in (56a) must be that the ‘words’ are ‘on the blackboard’ before ‘he erased them’. The word order in (56a) is therefore in accordance with the temporal sequence. On the other hand, in (55b), the ‘words’ are on the ‘blackboard’ after ‘he wrote’ on it. Thus, the word order in (55) and (56) reflect the temporal sequence in our conceptual world. The contrast between them in word order is naturally explained by PTS.

The tendency regarding the definiteness of a noun phrase is particularly informative with regard to the contrast between a bā sentence and its corresponding SVO sentence. If we follow Thompson (1973) in assuming that a bā sentence presupposes that the agent does something to the noun phrase,
then (57) represents two states with bā shū (to do something to the book) as a state temporally precedes mài-le (to sell the book), in the conceptual world, in which the planned action temporally precedes the actual action.¹⁴

(57) tā bā shū mài-le
He sold the book.

PTS therefore provides a plausible explanation for Light's observation that the meaning of nouns and adverbs in Chinese depends on their location before or after the main verb.

6. Conclusion

We have seen that PTS has an independent motivation and great explanatory value in Chinese grammar. It subsumes under one general principle a large number of word order rules hitherto regarded as unrelated. It governs the word order behaviors of the majority of the syntactic categories definable in this language. PTS can therefore be regarded as a general syntactic constraint. Furthermore, since it is defined in terms of the notion of temporal sequence, it has a conceptual content that most of the constraints proposed in the history of transformational grammars do not exhibit.

In conjunction with the fact that grammatical categories are fuzzy in Chinese due to its non-inflectional nature, the existence of PTS seems to suggest that the essential strategy of Chinese grammar is to knit together syntactic units according to some concrete conceptual principles. In other words, Chinese grammar refers to principles corresponding to the conceptual world more than grammatical rules operating on syntactic and morphological categories. In contrast, English, being an inflectional language to some extent, seems to refer to grammatical rules based on recognizable grammatical categories. From the point of view of mapping theories from semantic structures to surface structures, it can be informally stated that while a non-inflectional language like Chinese has more direct mappings, an inflectional language like English has more indirect mappings via a level of constraints definable on formal syntactic categories.¹⁵

In connection with the problem of how semantic relations among syntactic units are expressed in different languages, Chomsky (1966) has pointed out that the Port Royal Grammar considers the expression of these relations in case systems, by internal modification, by particles, or simply by a fixed word order. It is obvious that Chinese relies mainly upon word order. In the same context, Chomsky also refers to Du Marsais for the correlation between
freedom to transpose and wealth of inflection. As can be seen from the present study, Chinese word order is either fixed or changeable with meaning differences. However, a more significant fact is that this language takes the verb as the central reference point and orders elements semantically connected with it according to temporal sequence. It is in this sense that Chinese word order is not an arbitrary mechanism of abstract nature which relates semantics and syntax. Chomsky seems to have suggested that all of the four basic mapping systems are arbitrary in that they do not have to correspond to thought forms. Chinese, however, presents an interesting case where the word order corresponds the thought flow in a genuinely natural way.

Slobin (1966) has shown that sentence comprehension is complicated when the order of elements in surface structure deviates from the perceptual order. PTS is therefore natural in the sense that it requires the least psychological complexity in language processing. Recently, Hsieh (manuscript) and Huang (1981) have studied Chinese quantifiers in different frameworks, yet both observe that the surface order for Chinese quantifiers reflect the scope order in logical form. PTS and quantifier order together strongly suggest that there is a general isomorphism between the conceptual world and surface order in Chinese. The principle of agent before patient and that of whole before part therefore deserve further investigation as another two conceptual principles in this language.16

PTS is a natural principle in another sense. Osgood (1980) have made a significant distinction between natural word order and salient word order in natural languages. While the natural order is perception based, the salience order carries a speaker's interests, involvement, focus, etc. Thus, while Because John went walking in the freezing rain he caught cold is in natural order, John caught cold because he went walking in the freezing rain is in salient order. PTS is a principle governing natural word orders. Genuine counter-examples against PTS in Chinese can only be claimed after the salient factors in this language have been studied systematically. Pending further evidence to the contrary, PTS must be held as a word order principle of greatest generality in Chinese grammar.

Haiman (chiefly 1980, 1983) has shown that iconicity plays a very important role in the grammars of human languages. In his theory, PTS is an iconic motivation par excellence, since in this case the structure of language directly reflects the temporal structure of reality. As is correctly pointed out by Haiman (1980), while PTS is the most widespread iconic motivation, it is not universal. Chinese appears to employ this iconic motivation more consis-
tently than many other languages that I know. My recent research on the iconicity of Chinese grammar suggests that in addition to PTS, Chinese also exhibits other types of iconic motivation to a large extent. This leads us to Hsieh's (1978) observation that Chinese is a "pictorial" language. If it can be maintained that Chinese is basically an iconic language in both spoken and written forms, and if it can be further proved that the iconicity in this and other languages doesn't necessarily correlate with the lack of inflection, it is then hard for us to ignore a contention often made by Chinese philosophers that Chinese thought tends to emphasize the perception of the concrete. A weak form of the Whorf hypothesis can then be entertained to the effect that language and thought interact closely.

NOTES

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1) When we assign a consecutive reading to (7b) with the meaning of 'John slept and went upstairs', it becomes more acceptable, particularly with a pause between the two verb phrases. Yet, for this intended consecutive reading, (7b) normally requires overt temporal connectives such as xian ‘first’ and hou ‘afterwards’, i.e., ZHANG SAN XIANG SHUI JIAO, HOU SHANG LOU. Furthermore, (1a) can have a purposive reading, in addition to the consecutive reading. For (7b) to have a purposive reading, it needs to have WEI LE ‘for’, i.e., ZHANG SAN WEI LE SHUI JIAO SHANG LOU. The fact that (7b) is ungrammatical for either consecutive reading or purposive reading provides another evidence that serial verb constructions in Chinese correspond to temporal sequence of events in the conceptual world.

2) It is a well-known fact that the conjunctions in a coordinate structure involving no temporal sequence are reversible.

3) Chan (1974) has examined Li and Thompson's idea of simultaneous action in serial verb constructions and found "In fact, what seems to be the case is that the initiation of Act₂ cannot precede that of Act₁ but may or may not end at the same time as Act₁." (P. 343). He has concluded that the precedence of Act₁ over Act₂ is crucial in purposive acts and in consecutive acts as well.

4) One might want to consider yi ... jiù 'as soon as' as a conjunction expressing simultaneous actions. Yet, the essential meaning of this construction is the immediacy between two consecutive actions. Thus, there is clear meaning contrast between (1) and (2).

(1) tā yì dào, wǒmen jiù kāi huì
We will start the meeting as soon as he arrives.

(2) wǒmen yì kāi huì, tā jiù dào
He will arrive as soon as we start the meeting.
5) This aspect of their semantics is particularly clear when they are in the past or past perfective tense.

6) With the classical 之 ‘from’, (16b) would have a grammatical order. Similarly, with classical 与 ‘be at, to by’ or 以 ‘with’, a modern Chinese prepositional phrase can occur after the verb. It is obvious that classical Chinese doesn’t observe PTS. Those classical patterns adopted in modern literary Chinese therefore need not be regarded as counterexamples to PTS as a general word order constraint in Modern Chinese.

7) See Teng (1975b) for an important study on location and movement. While I don’t share his views on explanations, several interesting phenomena pointed out by him can further test the explanatory power of PTS in future research.

8) See Li and Thompson (1975a) for a detailed discussion of this type of constructions. While they claim that the two actions or two events in this type of constructions occur simultaneously, they also notice that the action denoted by the second verb occurs in the period during which the action denoted by the first verb with 之 has been taking place. Thus, the syntactic unit suffixed with 之 must precede the following predicative unit in temporal order.

9) Verbs such as 住 ‘to live’, 睡 ‘to sleep’ and 坐 ‘to sit’ can have the 在 phrase either before or after the verb with little meaning contrast (See Tai 1975 for a detailed discussion). For example, to most native speakers, (1a) and (1b) are free variations.

   (1)  a.  tā zài shànghǎi zhù
       b.  tā zhù zài Shànghǎi
       He lives in Shanghai

Previous accounts on the locative 在 phrase offer little explanation for the free order in question. It can, however, be explained in terms of temporal sequence. These verbs denote durative states rather than transient actions. The temporal sequence between the 在 phrase and this group of verbs is blurred. PTS therefore doesn’t apply.

10) The list is not intended to be exhaustive for the application of PTS. For example, PTS can be used to account for the difference in word order between (1) and (2).

   (1)  chà yīkè shídīǎn
       A quarter to ten o’clock.

   (2)  shídīǎn guò wǔfēn
       Five minutes past ten o’clock.

Many native speakers from Taiwan or mainland China do say shí diǎn chà yìkè ‘a quarter to ten o’clock’. Yet, guò wǔfēn shí diǎn is unacceptable to them. My conjecture is that both expressions obey PTS, with shí diǎn chà yìkè as due to the whole-before-part principle. Thus, shí diǎn chà yìkè is an exception to PTS and not a counterexample.

Similarly, the word order contrast between (3) and (4) as well as between (5) and (6) follows PTS.

   (3)  chà yì diǎnr wàn le
       Almost to be late

   (4)  wàn le yì diǎnr
       A little late

   (5)  kuài yì diǎnr zǒu
       To hurry to leave
(6)  
zōu  kuài  yìdiǎnr  
To walk a little faster

It is not clear, however, that PTS can account for the placement of a benefactive expression before the verb as in wǒ gěi tā mǎi-le sān běn shū. Nor can the principle explain why this sentence is ambiguous with both benefactive and goal readings.

11) See Cheng (1967), Chao (1968) and Light (1979) for more examples of the whole-before-part principle.

12) It is a well-known fact that dōu requires objects to be placed before the verb. John Hou (1979) has correctly observed that dōu denotes the totality of the noun phrase with which it is associated. When the noun phrase associated with dōu is not a grammatical object, its function has to be adverbial (as in (53) and (54)) and with dōu it defines a scope for the verb.

13) Frequency expressions such as chángcháng ‘often’ and hěn shǎo ‘rarely’ can only occur before the verb. While they do not refer to enumeration of each time as sān cì ‘three times’ does, they do not define a clear scope either. They are therefore beyond the explanatory power of PTS.

14) Recently Mei Guang (1978) has done a significant study on bā sentences. He analyzes a bā sentence as consisting of presupposition, i.e., tā bā shū and focus, i.e., mǎi-le. His analysis further supports the explanation of the bā word order in terms of temporal sequence.

15) See Tai (1982) for a detailed discussion.

16) The agent-befor-patient order has been construed as an analog of temporal sequence by Weil (1978) and as a natural order by Osgood (1980).

17) For example, see Nakamura (1964).

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Appendix: Glosses of Chinese sentences.

(1) wǒ chī-guo fàn, nǐ zài dà diànhuà gěi wǒ
   I eat-aspect meal, you then make telephone to me

(2) wōmen gōngzuò yì jiéshù, tā jiù lái-le
   we work once finish, he immediately-then come-aspect

(3) nǐ gěi tā qián, tā cāi gěi nǐ shū
   you give him money, he only-then give you book

(4) wǒ chī-guo fàn zài dà diànhuà gěi nǐ
   I eat-aspect meal then make telephone to you

(5) Lǐ xiáojié chī-le bàn wǎn fàn jiù bāo-le
   Li miss eat-aspect half bowl rice immediately-then full-aspect

(6) nǐ gěi-le wǒ qián cāi néng zǒu
   you give-aspect me money only-then can leave

(7) Zhāngsān shāng-lóu shuì-jiào
   Zhangsan ascend-stairs sleep

(8) Zhāngsān dào tūshūguǎn ná shū
   Zhangsan reach library take book

(9) Zhāngsān ná shū dào tūshūguǎn
   Zhangsan take book reach library

(10) Zhāngsān tiāntiān huì-ke xiě-xìn
    Zhangsan everyday receive-guest write-letter

(11) wōmen kāi-huì jiējùé wèntí
    we hold-meeting solve problem
(12) Zhāngsān qì jiǎotàčē zǒu-le
Zhangsan ride bikee leave-aspect

(13) tā yìbiānr zǒu-lù yìbiānr kàn-shū
he one-side walk one-side read

(14) tā nián-wǎn-le zhèi běn shū
he read-finish-aspect this volume book

(15) tā zuò-chéng-le zhèi jiàn gòngzuò
he work-succeed-aspect this item work

(16) tā cóng Zhōngguó lái
he from China come

(17) tā zuótiān dào Měiguó lái
he yesterday reach the United States come

(18) tā zuótiān lái dào Měiguó
he yesterday come arrive the United States

(19) tā zuò gōnggōng qìchē dào zhèr
he ride public car arrive here

(20) tā dào zhèr zuò gōnggōng qìchē
he arrive here ride public car

(21) tā cóng San Francisco zuò greyhound bus jǐngguò Chicago
he from San Francisco ride greyhound bus pass Chicago
dào New York
arrive New York

(22) tā bǐ wǒ gāo
he compare me tall

(23) tā shuō Zhōngguó huà bǐ wǒ shuō Riběn huà
he speak China speech compare I speak Japan speech
shuō de hǎo
speak de good

(24) tā wàng nán kàn
he towards south look

(25) tā duì wǒ shuō
he face me speak

(26) tā gèn wǒ qù
he follow me go
(27) tā duì-zhe wǒ xiào
he face-ing me smile

(28) tā xiào-zhe duì wǒ
he smile-ing face me

(29) tā hěn kuài de pǒ-le
he very fast de run-aspect

(30) tā pǎo de hěn kuài
he run de very fast

(31) tā yòng kuài zi chī-le nèi wǎn fàn
he use chopsticks eat-aspect that bowl rice

(32) tā yòng kuài zi chī fán
he use chopsticks eat meal

(33) tā hěn gāoxìng de wǎnr
he very happy de play

(34) tā wǎnr de hěn gāoxìng
he play de very happy

(35) tā zài chūfáng-li zuòfàn
he locate kitchen-inside cook

(36) tā diào zài chuī-li
he fall locate water-inside

(37) xiǎo hóu zi zài mābēi-shang tiào
small monkey locate horse-back-on jump

(38) xiǎo hóu zi tiào zài mābēi-shang
small monkey jump locate horse-back-on

(39) tā bìng-le sān tiān le
he sick-aspect three day sentence-final particle

(40) tā zǒu-le sān tiān le
he leave-aspect three day sentence-final particle

(41) tā ǹg-le yǐjīng yǒu sān tiān le
he sick-aspect already have three say sentence-final particle

(42) tā kàn shū kàn-le sān tiān le
he read book read-aspect three day sentence-final particle

(43) tā shěng bìng shēng-le sān tiān le
he contract sickness contract-aspect three day sentence-final particle

(44) tā lāi-le sān cì
he come-aspect three time

(45) wǒ dā-le tā sān dì
I hit-aspect him three time

(46) wǒ dā tā dā-le sān cì
I hit him hit-aspect three time

(47) tā pāo lèi-le
he run tire-aspect

(48) tā lèi de bù néng shuō huà le
he tire de not able speak speech sentence-final particle

(51) tā zuòtiān zòu-le
he yesterday leave-aspect

(52) nǐ bù zài de shíhou, tā zòu-le
you not locate de time, he leave-aspect

(53) tā sān tiān lái dōu bìng-zhe
he three day come all sick-ing

(54) tā sān cì dōu shìbài-le
he three time all fail-aspect

(55) tā bā hēibānshàng-de zì xiě-le
he take blackboard-'s character write-aspect

(56) tā bā hēibānshàng-de zì cā-le
he take blackboard-'s character erase-aspect

(57) tā bā shū mài-le
he take book sell-aspect