

Whorfian Hypothesis and Language Complexity: A perspective from the diachronic development of the Chinese spatial metaphor for PAST and FUTURE

Charles N. Li

University of California, Santa Barbara

I. The perception of time

Everyone knows that our perception of space has a biological base, namely, the sensory modality of vision. Everyone also knows that we don't have a sensory modality for the perception of time. Our sense of time depends on our state of awareness and the impact of the events on our senses. When our environment registers little or no impact on us, we feel that time moves slowly. This is why a bored person wishes time would speed up, while a busy and pre-occupied person feels that time moves too quickly and wishes it would slow down. We can be busy one day, but bored the next day, and our perception of the passage of time changes accordingly.

The vicissitude of our perception of the passage of time is also attested by our remembrance of the past. If we are reminiscing a period of the past when we were involved in a multitude of significant events and activities, its duration seems long. Conversely, if we are reminiscing an insignificant period of our life, its duration appears short and brief. Observe that our memory of time in the past is the opposite of our view of the passage of time in the present. Indeed, the human perception of time is a chimera of immense proportion. It inspired Proust to embark on his monumental work. It is also the leitmotif of Thomas Mann's *Magic Mountain*, another cornerstone of the canon of literature.

II. Expressions of PAST and FUTURE in human communication

Given the elusive nature of time in our experience, humans are motivated to construct a physical image, a concrete footing, to buttress our chameleon perception so that we can maintain some level of objectivity when we communicate with each other about events or situations involving the passage of time. Language bears witness to this motivation. To speak of time in terms of space is a universal metaphor in all languages of the world. Unlike many other language universals, this one is absolute and without exception. In English, as it is in many other languages, we recruit an array of spatial terms to express time. For example, we speak of the distant (past), the near (future), a remote (time), before (the War), after (the New Year), ahead (of his time), behind (a schedule), at (three o'clock), on (Christmas day), in (1962), and so on.

Among Indo-European and many other languages, the dominant spatial metaphor of time is linear, with the speaker as the point of reference during speech, placing the past behind and the future in front of the speaker.

For example, we say

“March forward into the future, don’t look back in the past!”

And we never say,

*“The future is behind you” or *“Look ahead into the past!”

Similarly, we say,

“I’m looking forward to the new year”

but never,

*“I’m looking backward to the new year.”

Utterances such as ‘Look back into the future’ are unacceptable, not because their syntax or morphology is faulty, but because they violate the cultural norm of the spatial metaphor for time in English.

Given the prevalence of this cultural norm in languages of the world, I will call it the Standard Model of expressions of time.

Language, however, is not the only vehicle of interpersonal communication. We also communicate by gestures, facial expressions and body postures. In most cultures, speech is typically accompanied by spontaneous gestures, most of which are not learned or consciously executed. For example, people often gesture when they speak into a cell phone as if they were engaged in a face-to-face conversation. Gestures are also used by congenitally blind people, who could not have acquired them by imitating or learning from others. Like sighted people, they gesture when they talk, and furthermore, they use the same range of gestures conveying the same information as sighted people do. It is possible that gestures during speech not only reflect but also facilitate our thoughts when we speak.

If language reflects the cultural norm of spatial metaphors for time, one expects that those who speak of the past as behind them and the future, in front of them, would point to their front to denote the future and point behind them to signal the past. That’s exactly what English speakers do, without hesitation and without exception. In fact, gestural expressions of cultural norms are much more CONSISTENT than linguistic expressions. In many cultures where the past is behind and the future is in front, their languages typically have a variety of expressions for ‘past’ and ‘future’, and some of these expressions may violate or contradict their dominant spatial metaphor for time. I will present the details of an interesting case of contradictions in Chinese. In English where spatial terms

denoting time are predominantly consistent with the Standard Model, one can find many counterexamples. Consider, for instance, the utterance:

‘Our history is passed down orally from our ancestors’

There the past flows ‘down’ to the present.

Consider another utterance,

‘Hey, our vacation is coming up!’

Here time is moving ‘up’ from the future to the present. In these examples, we have a vertical representation of time. The past is above and the future is below the speaker.

Even more bizarre in English, one can say,

‘He is one hour ahead of our appointment at 3:00 p.m.’

Here the word ‘ahead’ denotes a point in time before ‘3:00 p.m.’ contradicting the cultural norm of the metaphorical pattern: past is behind, not ahead.

Unlike the English language which provides various spatial metaphors for PAST and FUTURE, a native speaker of English never points backward or upward to signal the future, and s/he never points to his front to signal the past. The vicissitude of language is an interesting point which I will address later. Here, I wish to make clear that in a community where time is represented in a linear space with the speaker as the point of reference, one can gesture either to the front or to the back in order to signal the past, but one cannot gesture to the front in one instance and then gesture to the back in another instance. The efficacy of communication does not allow that.

But the Standard Model is NOT universal in languages of the world. Cultures differ from each other in dramatic fashion. One would think that there must be cultures which employ different spatial metaphors for PAST and FUTURE.

Here the works of S. C. Levinson (2003) and many others loom large; I will very briefly summarize three known types of spatial metaphor for time in addition to the Standard Model without repeating second- or third-hand data.

(i) The past is in front and the future is behind

This metaphor is the opposite of the Standard Model. An example is Aymara (R. Núñez & E. Sweetser, 2006), a family of languages spoken in the Andean mountains of South America ranging from Bolivia, Peru, Chile to Argentina, with one to two million speakers.

Just because the Aymara's spatial metaphor for time is the opposite of the Standard Model, we must not think theirs is counterintuitive. Their metaphor rests on the rationale that the past is known, and the future is unknown. Thus, one can visualize the past as one can see what is in front, but one cannot visualize the future unless one claims to have the magical power of a soothsayer. It is interesting that the Aymara word for 'front' which signals the past also means 'eye sight'.

(ii) The past is east and the future is west

An example is Pomuraw (Boroditski, L. & Gaby, A., 2010), a language spoken by an aboriginal tribe on the southwest coast of Cape York peninsular in Queensland, Australia.

If a Pomurawan faces west, the future is in front. If s/he faces east, the future is behind. When a Pomurawan arrives at a new location, his first task, in order to collect himself and speak coherently, is to make sure that he recognizes the cardinal directions from where he stands.

A plausible origin of the Pomuraw metaphor is the movement of the sun from the east to the west as in the passing of the day. A day begins with the sun rising

from the east and ends with the sun setting in the west. Using the position of the sun to mark the time of a day is universal among people living in the tropical and temperate zones. The Pompuraawan has simply taken this marking of the passage of a day one step further by using it as a metaphor for the flow of time.

(iii) The past is downhill and the future is uphill

A more dramatic exception to the Standard Model of spatial representation of time is Yupno (Núñez, R., Cooperrider, K, Doan, D. & Wassmann, J. 2012), a language of the eastern Papuan highland in Papua New Guinea.

Yupno country is an isolated valley surrounded by dramatic mountains in East Papua New Guinea. The Yupno people do not refer to time in terms of cardinal directions such as north/south or east/west, nor do they represent time by a linear spatial metaphor.

Their spatial metaphor for time is topographic.

The past is downhill, and the future is uphill.

To give you an example illustrating how the Yupno's topographic metaphor works in various situations, consider a Yupno sitting inside a house. Since he cannot see the outside, one may wonder how he decides which direction is the past and which direction is the future.

It turns out that a Yupno house is always elevated. One goes downward to leave the house. Thus, a Yupno inside his house always points to the door to denote the past.

The preceding typological account provides four categories of spatial metaphor for PAST and FUTURE in languages of the world: The Standard Model, the opposite of the Standard Model, the East-West model, and the topographic model.

Then there is the Chinese language where PAST and FUTURE are nearly everywhere.

III. Chinese spatial metaphor for PAST and FUTURE

Earlier, I mentioned that Chinese employs a mixed bag of spatial metaphors for time. Mixed, not just in the manner of English where a few exceptions to the dominant metaphor can be found, but mixed on a more extensive scale. If one doesn't have a full account of the data, one may easily arrive at an erroneous conclusion of what constitutes the dominant spatial metaphor for the past and the future. Some psychologists and linguists have claimed, for instance, that past and future in Chinese is represented by the vertical axis (Boroditsky, L., Fuhrman, O. & McCormick, K., 2011), up-down, on the basis of such data as,

1. “*shang - ge yue / libai*”
 up - particle month / week
 ‘last month / week’

 “*xia - ge yue / libai*”
 down - particle month / week
 ‘next month /week’

This up-down metaphor applies to many time expressions such as ‘month’, ‘week’, ‘semester’, ‘dynasty’, ‘generation’, etc, in SOME contexts, but it doesn't apply to many other time expressions such as ‘year’, ‘day’, ‘hour’, ‘century’, etc.

In order to demonstrate that the UP and DOWN axis is NOT the dominant pattern of spatial metaphor in the Chinese language, let me, first, show some

examples of time expressions that do not employ the vertical metaphor as in item (2):

2. **“shang - (ge) nian”* **“xia - (ge) nian”*
 up - particle year down - particle year
- **“shang - (ge) tian”* **“xia - (ge) tian”*
 up particle day down particle day

Secondly, even when the ‘up’ and ‘down’ metaphor occurs with ‘month’ and ‘week’ to signal ‘last month/week’ and ‘next month/week’, its usage is restricted. For instance, one cannot use “*shang*” ‘up’ to denote ‘the past few weeks’ even though one CAN use “*shang*” ‘up’ to say, ‘last week’. Item (3) illustrates this point:

3. **“shang ji - ge yue / libai”*
 up few particle month / week

The correct way of saying ‘the past few months/weeks’ employs the spatial word, “*qian*” ‘front’, or, “*hou*” ‘back’, given in item (4).

4. **“qian ji - ge yue / libai”*
 front few particle month / week
 ‘The past few months/weeks’

Alternatively, one can use a construction whose word order is the opposite of (4), as shown in item (5),

5. **“ji - ge yue/libai qian / hou”*
 few particle month/week front / back
 ‘a few months/weeks ago/ahead’

In both items (4) and (5), the spatial word, “*qian*” ‘front’, denotes the past and the spatial word, “*hou*” ‘back’, signals the future. I will return to this ‘front/back’ metaphor shortly. At this juncture, let me point out that the Mandarin Chinese usage of this horizontal metaphor, exhibited by items (4) and (5), is identical with that of the Aymara tradition which is diametrically opposed to the Standard Model. In other words, items (4) and (5) show that the past is in front, and the future is behind.

Thirdly, not only is the usage of the ‘up/down’ metaphor highly restricted in Chinese, only the front/back metaphor can signal what comes before or after a point of temporal reference, whether that point of reference is a state, an event, an action, or an expression of time. Item (5) is an example. Its syntactic construction is represented by structure (A):

(A) X + (*yi* -) *qian* / *hou*

where X, signifying the temporal point of reference, may be a noun, a phrase or a clause.

Observe that the constituent order of structure (A) is the opposite of the one exhibited by examples 1, 2, 3, 4. In these examples, the spatial word, whether it belongs to the front/back or the up/down axis, always precedes the head noun.

Their constituent structure is summarized by (B):

(B) *qian* / *hou* or *shang* / *xia* + Y

What is significant is that the constituent Y in structure (B) is primarily a simple noun, sometimes a noun phrase and never, a clause. Furthermore, any noun which can serve as the constituent Y in construction (B) can also serve as the constituent, X, in structure (A). In terms of distribution, the constituent, Y, in structure (B) constitutes a small subset of the constituent, X, in structure (A).

This distributional gap is further enhanced because the up-down metaphor does not occur in structure (A).

Given this distributional difference between structure (A) and structure (B), it should be obvious that the dominant spatial metaphor for time in Chinese is the front-back axis. Item (6) of the handout provides a set of examples illustrating structure (A) which employs exclusively the dominant front-back metaphor:

6. “*yi nian (yi -) qian*”
one year particle front
‘one year ago’

“*yi nian (yi -) hou*”
one year particle back
‘one year later’

“*lian - ge yue (yi -) qian*”
two particle month particle front
‘two months before’

“*lian - ge xinqi (yi -) hou*”
two particle week particle back
‘two weeks later’

“*yi xiaoshi (yi -) qian*”
one hour particle front
‘one hour earlier’

“*lian fenzhong (yi -) hou*”
two minute particle back

‘two minutes later’

“*er-shi shiji (yi -) qian*”

twenty century particle front

‘before twentieth century’

“*wo chifan (yi -) qian, ...*”

I eat particle front

‘Before I eat, ...’

“*ta qu Meiguo (yi -) hou, ...*”

s/he go America particle back

‘Before he went to America, ...’

Fourthly, the front/back metaphor for PAST and FUTURE is widely attested in the oldest Chinese texts dating back to the 9th century B.C. The vertical up/down metaphor made its appearance several centuries later in very limited usages involving the hours of the day and the months of a year. These limited usages suggest that ‘up’ and ‘down’ refer to the location of a unit within a list in the written language. The most common written lists specify the twelve time periods of a day and the twelve months of a year. Before 20th century, these lists were always presented in writing beginning with the earliest hour or month at the top.

Item (7) in the handout contains examples of the front/back metaphor for PAST/FUTURE taken from vernacular texts of different historical periods, illustrating its common usage since the 9th century B.C. Notice that the distributionally dominant structure (A) made its appearance in the 5th example of item (7).

7. “*qian wang*” (Shi Jing, Book of Odes, 11th - 5th century B.C.)

front king

‘the former king’

“*hou ren*” (Shang Shu, Book of Documents, 11th - 4th century B.C.)

back people

‘descendants’

“*zi jin zhi-yu hou ri*” (Shang Shu, Book of Documents)

from today until back day

‘from today to the future’

“*qian shi*” (Chu Ci, Songs of Chu, 4th century B.C. – 1st century A.D.)

front generation

‘past generation’

“*wo sanshi nian qian*” (Zu Tang Ji, Collections from the

I thirty year front Patriarchs’ Hall, 10th century A.D.)

‘Thirty years ago, I ...’

“*qian shi zhi bu wang,* (Zhan Guo Ce, Strategies

front affair Nominalizer not forget of the Warring States,

‘Not forgetting the past,’

3rd century B.C. – 1st

century B.C.)

“*hou shi zhi shi*”

back affair Nominalizer teacher

‘lessons for the future’

“*ri hou kuei- ci ...*” (San Chao Bei Men Hui Bian,

day back detect Collections of the Northern Treatise
'looking into the future of Three Dynasties, 12th century A.D.)

Once we have established the dominance of the front-back metaphor in Chinese on the basis of both synchronic and diachronic data, it seems that we have reached the end of a description of the Chinese spatial metaphors for PAST and FUTURE.

But the interesting part has yet to unfold.

IV. The diachrony of the Chinese spatial metaphor for PAST and FUTURE

While there is no doubt that structure (A), X + *qian/hou*, where “*qian*” ‘front’ denotes the past and “*hou*” ‘back’ denotes the future is dominant, the literal meanings of “*qian / hou*”, ‘front/back’, and “*shang / xia*”, ‘up/down’ in temporal expressions appear to be in the process of being bleached in contemporary speech. My intuition and the anecdotal responses from native Chinese speakers support this on-going bleaching process. When I point out to native speakers the literal meanings of those spatial words in temporal expressions, they often express surprise. A common response is “You are right! But I never realized it!”

The bleaching of the literal meanings of the spatial words in structure (B), where the spatial word occurs initially, can be attributed to the process of lexicalization. That is, expressions such as “*qian tian, shangwu, houtian, xia xinqi, etc*” are at various stages of fossilization or idiomatization. While one may wish to consider these temporal expressions as lexical items or idioms, I should point out that structurally, many of them retain some degree of flexibility suggesting that their fossilization is not complete. For example, one can insert

constituents between the spatial word, *qian / hou*, and the constituent, Y, in structure (B). We have already seen in earlier discussion, the expression, “*qian ji tian*” ‘the past few days’, where the quantifier, “*ji*” meaning ‘a few’, occurs between the spatial word “*qian*” ‘front’ and the head noun. Other constituents can also be inserted, e.g.

8. “*qian er - san - shi nian*”
front two - three - ten year
‘twenty or thirty years ago’

where “*er san shi*” means ‘twenty or thirty’ so that the expression means ‘Twenty or thirty years ago’.

One can also modify the spatial word, *qian / hou*, in structure (B) with the word, “*da*” as in item (9):

9. “*da qian tian*”
big front day
‘three days ago’

which means ‘two days before yesterday’ or ‘three days ago’.

In spite of the structural plasticity of the lexical items such as “*qian tian*”, there is no doubt that the literal meanings of “*qian*”, “*hou*”, “*shang*”, “*xia*” in those contemporary temporal expressions are on their way of disappearing from the consciousness of the native speaker. Diachronically, however, the dominant spatial metaphor for PAST and FUTURE in the Chinese language has been, for several millennia, pairing PAST with ‘front’ and FUTURE with ‘back’. I will, shortly, present diachronic data to confirm this critical point.

First, let’s ascertain how contemporary Chinese visualizes the past and the future.

When asked to indicate the future and the past by pointing or gesturing, native Chinese speakers point in front of them to signal the future, and behind them to indicate the past. The result of my survey of native Chinese speakers contradicts the codification of their language which predominantly pairs the future with ‘back’ and the past with ‘front’, even though this codification, as I have just pointed out, is in the process of being weakened through lexicalization and grammaticalization. The contradiction is fascinating from the perspective of language and cognition.

Beside my survey, there are many widely used expressions in common modern Chinese speech indicating that the future, in the contemporary Chinese mind, is in front, NOT behind the speaker. I cite an example in (10):

10. “*qian - tu*”
front journey

(10) is synonymous with ‘future (of a developing entity)’. If a ‘journey in front’ has the metaphorical meaning of ‘future’, the implication is that speakers consider the future to be in front of them. The expression, “*qian-tu*” is used, for instance, when one toasts a young person or sends him/her a congratulatory card on the occasion of an important milestone in his/her life as in item (11),

11. “*zhu ni qian - tu shunli*”
wish you future smooth and successful
Wish you a smooth and successful future’

It is also used in ordinary speech for any discussion of the future of a person or an institution, for example, item (12),

12. “*wo bu qu Mexige, nar mei qian-tu*”
I not go Mexico, there not:have future
‘I am not going to Mexico, there is no future’

“*zhe-yang de gongsi bu hui you qian-tu*”

this:manner particle company not can have future

‘A company like this cannot have any future’

On the one hand, “*qian-tu*” functions as a temporal expression designating ‘future’ in the contemporary Chinese language. On the other hand, the same expression in pre-Modern vernacular texts has only the literal spatial meaning, ‘journey ahead’, NOT the temporal meaning, ‘future’. For example, item (13), from the poems of two great Tang Dynasty poets:

13. “*ju bian fang QIAN-TU*”

raise whip explore front – journey

‘Raise your horse whip and explore the journey ahead’

(Wu Yue Dong Lu Xin, ‘A May journey to Eastern Lu’, by Li Bai, 8th century)

“*tian ming deng QIAN-TU*”

sky bright embark front – journey

‘The sky brightens, let’s embark on our journey ahead.’

(Shi-hao Li, ‘The Official of Shihao, by Du Fu, 8th century)

Items (10) – (13) suggest the possibility that the Chinese perception of FUTURE has changed from being in the back of a speaker to being in front of a speaker. If it is true, it will be a significant and dramatic shift in perception in a linguistic community of enormous size. But items (10) – (13) do not prove such a perceptual transformation.

Another piece of evidence in support of the possibility of a shift in the Chinese perception involves an elegant, literary version of the colloquial expression “*qian-tu*”. This literary expression is item (14):

14. “*qian-jing*”

front-scene

This literary rendition of the Modern Chinese colloquial word for ‘future’ is interesting because as recent as three centuries ago, it means, ‘scenes of the past’ as attested in the celebrated novel, *Dream of the Red Chamber*. In the 17th chapter, there is a description of the protagonist, Baoyu, revelling in his remembrance of the past, when suddenly another character asked him to do a chore. At this juncture, the author told us that Baoyu ignored the request, before writing item (15):

15. “*Baoyu zhi gu sixiang qian-jing*”

Baoyu only concerned think:about front-scene

‘Baoyu was only concerned with thinking about scenes of the past’

(From the 17th Chapter of *Dream of the Red Chamber*)

Yet, the same expression, “*qiang-jing*”, in modern Chinese literature has the opposite meaning, ‘scenes of the future’. In a contemporary novel entitled “*Crying Out in a Drizzle*”, the author describes two lovers who often dream about their future together. But they are forced apart, and the author writes item (16):

16. “*liange ren bu kenan zai zai yiqi xinzh-popo de*

two person not possible again to:be:at together exuberantly Part.

miaohui memiao de qian-jing

describe enchanting Part. front-scene

‘It is not longer possible for the two to be together again to describe the enchanting scenes of the future’

(Zai Xiyu Zhong Huan, ‘Crying Out in a Drizzle’, by Yu Hua)

The data involving the modern usage of the expressions “*qian-tu*” and “*qian-jing*” support contemporary native speakers’ claim that they see the future in front not behind. Other than these two expressions, there are many propaganda slogans in modern China demonstrating that the future is, unambiguously, in front not behind. I cite one such slogan from pre-capitalist China more than fifty years ago:

17. “*women bu-duan-de xiang qian yungjing,*

we incessantly toward front surge

‘We (must) never cease surging ahead,

zhenqu shouxian daoda shehuizhuyi

strive the:first attain socialism

striving to be the first to attain socialism’

If contemporary Chinese people visualize the future in front of them, we may infer that the Chinese spatial conception of FUTURE has undergone a 180° switch, on the basis of the linguistic data which unambiguously demonstrate that the dominant paradigm pairs FUTURE with ‘back’ and PAST with ‘FRONT’. To confirm this inference, one needs to ascertain how Chinese people visualized the future in pre-modern days. On this point, the colloquial text of the 8th century A.D. contains two telltale and revealing pieces of data. They are cited by Xu Dan in a typological study, ‘The Chinese language meets typology’. I reproduce them in item (18) with my own gloss and translation:

18. “*qian bu jian guren*”,
front NOT see ancient people
‘In front of me, I don’t see the people of the antiquity’
- “*hou bu jian lai – zhe*”
behind NOT see come – people
‘Behind me, I don’t see the people who are yet to come.’
- (Chen Zi-Ang, 7th - 8th century A.D.)

Here, the author, Chen Zi-Ang, is lamenting his historical and intellectual isolation. He does not see the people of antiquity in front of him and cannot visualize men of the future behind him. The past is in front, and the future, behind!

This 8th century couplet, together with the contrasting evidence exemplified by items (10) – (16), demonstrate that pre-Modern Chinese speakers’ spatial conceptualizations of PAST and FUTURE were congruent with the dominant spatial metaphor for ‘PAST/FUTURE’ in their language, i.e. the future was behind, signalled by the word, “*hou*” ‘back’, and the past, in front, signalled by the word, “*qian*” ‘front’.

Thus, my findings confirm that the Chinese perception of time has undergone a dramatic shift: From seeing the future in back of them to seeing the future in front of them, and furthermore, because of the data from the Dream of the Red Chamber, this shift occurred after the 18th century.

Let me summarize the Chinese linguistic evidence which has been presented:

First, Modern Chinese has two spatial metaphors for PAST and FUTURE. One involves the vertical axis where ‘up’ signals PAST and ‘down’ signals FUTURE. The other metaphor involves the horizontal axis where ‘front’ denotes PAST and ‘back’ denotes FUTURE.

Second, the front/back metaphor dominates in the sense that its distribution is wide-ranged while the up/down metaphor is narrowly restricted.

Third, the front/back metaphor has been dominant since the dawn of written literature more than 3 millennia ago, but it has been weakening through lexicalization and grammaticalization in modern time.

Fourth, the up/down metaphor for PAST/FUTURE may originate from the written language, in particular, the up/down list of the names of times of a day and months of a year.

Fifth, modern Chinese have shifted 180° their conceptualization of where the future is and where the past is, contradicting the dominant spatial metaphor for time in their language.

Before I launch into language complexity and Whorfian hypothesis from the perspective of these five empirical generalizations, let me interject one more question, which I suspect, may very well be at the tip of your tongue, and I will offer an answer to this question.

The question is: What brought about the shift of the Chinese spatial perception of time? After all, this shift is rather dramatic and involves a 180° turn-around of the perception of an enormous population.

My hypothetical answer is drawn from historical and circumstantial linguistic evidence such as the emergence of the temporal meaning of spatial expressions like “*qian-tu*” and “*qian-jing*” in modern Chinese. The transformation was, most likely, initiated through contact with European culture in the 19th century, and subsequently reinforced and solidified by the formal introduction of a colloquial written language during the May 4th Movement in early 20th century. The cultural revolution of the May 4th Movement changed the meaning of “*qian-tu*” from the literal sense of ‘journey ahead’ to a metaphorical sense of ‘future’, and popularized its temporal meaning. The same cultural revolution also produced a host of widely distributed political slogans such as item (19), which repeatedly placed the future in front of the people and the nation. Such slogans were regularly written on banners in all urban areas of the entire nation at the time,

19. “*women tichang zhengzhi gaige,*
 we promote political reform

xiang minzhu – zhidu qian - jin”
 toward democracy progress

‘We promote political reform ; Onward to democracy (ahead)!

Here a critical expression is at the end of the sentence, “*qian – jin*”, which literally means, ‘moving ahead (toward some destination in the future)’ implying that the future is in front.

During the May 4th Movement and afterwards, intellectuals, teachers and political leaders, most of them educated in Europe, America and Japan stressed the importance of westernization. They advocated the abolishment of old traditions, especially the one that emphasized the emulation of ancient China.

They wanted China to become a forward-looking, modern nation, and they were successful in their endeavours, especially on the cultural front by introducing a new written language based on colloquial speech. The cultural impact of this new written language is immeasurable. It is true that the Chinese intelligentsia did not consciously and explicitly waged a campaign to change the Chinese people's perception of future in spatial terms, i.e. from future in the back to future in front. However, having acquired their knowledge through Indo-European languages, they adopted the western way of looking ahead into the future and used that metaphor in their speech, writing and political activities with immense impact. Their practice would have been in line with the strong cultural and political fashion of the time.

Let me now turn to the impact of my findings on the Whorfian Hypothesis and language complexity.

V. Impact on the Whorfian hypothesis

The strong version of Whorfian Hypothesis claims that the structure of a person's native language determines his/her world view.

This version has been a dead horse beaten over and over again by linguists as well as psychologists. It is not worth repeating. In fairness, we should keep in mind that neither Benjamin Lee Whorf nor Edward Sapir articulated such a claim explicitly.

The weak version asserts that structural differences between languages are paralleled by non-linguistic cognitive differences. Even this version has drawn the ire of some scholars. Dan Slobin, a psycholinguist at Berkeley, has proposed a modified version. He points out that

“A language is not a neutral coding system of an objective reality. It is a subjective orientation to the world of human experience, and this orientation affects the ways in which we think WHILE WE ARE SPEAKING”. (Slobin, 1996)

The significant qualification in Slobin’s proposal is the phrase, “WHILE WE ARE SPEAKING”. In his attempt to rescue the Whorfian Hypothesis, he concedes that language does not always affect the ways we think, but it does while we are in the act of speaking. However, by restricting the connection between language and thought to the time of speech, Slobin’s modification has effectively stripped the Whorfian Hypothesis of any meaningful content. What has given life to the Whorfian Hypothesis is the undeniable connection between language and thought. I think it is time to forgo the name, Whorf, and formulate a sensible hypothesis that captures the relation between language and thought as follows:

A speaker’s language tends to predispose and channel his/her thoughts in a direction that reflects the lexicon, the patterns and the structures of that language.

I offer this hypothesis even though the contradiction between the dominant spatial metaphor for PAST/FUTURE in the Chinese language and the Chinese people’s perception of PAST and FUTURE constitutes a glaring exception. One may argue how much of this contradiction has waned in contemporary Chinese. But there is no denying that it has existed for decades and perhaps, centuries. What is my *raison d’être*?

First, I find justification for the proffered hypothesis from the different spatial metaphors for PAST and FUTURE in languages of the world. For instance, it is difficult to imagine that cardinal directions do not figure prominently in the

thought of Pompuraawans, the native Australians, or the speakers of languages of the Standard Model do not think their future lies ahead, whether or not they are speaking.

Secondly and more importantly, language is a product of evolution, and evolution is whimsical, serendipitous. There is no grand design in the evolution of an organism or its behaviour other than natural selection which shapes and nudges an organism and its behaviour to better survive and reproduce in its ecological niche. What makes evolution whimsical and serendipitous is the unpredictability of the forces and conditions in the environment, which constitute the ecological niche for each organism. This essential characteristic of evolution, i.e. its unpredictability, sets biological sciences apart from physical sciences. Biological sciences are concerned with living organisms and their behaviour, while physical sciences deal with inanimate objects such as matter and light and their properties. Given the way evolution operates, we must not expect water-tight, absolute laws and principles governing biological phenomena. Exceptions are the rule in biological sciences, and it is biological science where linguistics properly belongs, because regardless of Chomsky's lofty and grandiose claims, language remains a human behaviour with an evolutionary origin. This is the reason I formulate the inter-relationships between language and thoughts as a TENDANCY, not as a law or theorem.

Thirdly, beyond evolution, humans are shaped and formed by cultures. Each language is inextricable from the culture and society in which it functions. I don't need to belabour the interaction or inter-connection between culture, mind and language. What is relevant is that culture changes and transforms at lightening speed in comparison with biological evolution. The 180 degree transformation of the Chinese spatial perception of PAST and FUTURE is a case in point. It is, therefore, inevitable, that language, in so far as it reflects

culture, contains layers and layers of elements and structures that may or may not be logical and consistent. In short, language is a repository of multiple ways of speaking, not just a grammar and a lexicon as Chomsky claims. The multiple ways of speaking codify not only current cultural elements and patterns, but also selective cultural elements of the past, without the speaker being aware of what is old and what is new. As a consequence, there are no theorems in linguistics, there are only statistically or distributionally dominant tendencies and generalizations. It is simply wrong and foolhardy to transfer from mathematics to linguistics, the role of exception in validating or invalidating generalizations. The contradiction between the Chinese perception of PAST/FUTURE and the Chinese language's dominant spatial metaphor for time is a case in point.

VI. Impact on language complexity

As our knowledge of language expands, thanks to the efforts of those linguists who have spent years toiling in the field to record, study and analyze languages of the world, the discipline of linguistics has matured to a point that linguists can, now, explore variations in complexity among languages of the world (Nettle 2012). To cite a trivial example of this new linguistic endeavour, i.e. investigating variations in complexity among languages, I can mention that the number of contrasting sounds of a language is inversely related to the average length of a word in that language. The less contrasting sounds a language has, the longer the average length of words, and therefore, the more complex the words in that language.

My investigation of the historical development of Chinese spatial metaphors for PAST and FUTURE has led me to believe that written language may also play a role in contributing toward language complexity.

Written language, by virtue of the permanence of written records which inevitably become an important CULTURAL heritage of a literary society, is a potent conservative force. As such, it preserves obsolete words, expressions and structural forms which would otherwise be lost as spoken language goes on its merry way of changing and evolving at breakneck speed. As societies become more affluent and education becomes widespread, many of the obsolete ways of speaking preserved in written literature continue to survive in speech, enriching the spoken language and thereby increasing its complexity. Let me illustrate with an amusing example: One day, on a tennis court, I overheard a high school kid denigrating rather mercilessly a fellow student who refused his offer of a marijuana smoke. He ended his tirade by telling to his friend,

“In the old days, he’s called a square”

I was astonished by the youngster’s usage of the word, ‘square’, with that obsolete meaning. Unable to suppress my curiosity, I asked him where he picked it up. He said,

“I learned it from Jack Kerouac’s book, *On the Road*”

This is, of course, just an anecdote of how written records help to preserve what could have been lost in spoken language.

On the non-anecdotal front, my discussion of the diachronic development of the Chinese spatial metaphors for PAST/FUTURE suggests that written language may enhance the structure of a language. I hypothesized, in my description of the UP/DOWN metaphor for PAST and FUTURE in Chinese, that it probably originated from written lists in which the hours of the day and the months of the year were arranged from the top to the bottom, and posted in every government bureaucracy before the 19th century. My hypothesis is supported by the fact that

the occurrences of the vertical metaphor for time in early vernacular texts are exclusively on the hours of the day and later on extended to the list of months and ancestors including successive emperors of a dynasty. If this hypothesis is correct, the written language has contributed a different spatial metaphor for PAST and FUTURE in Chinese, even though it has never achieved the dominant status in the language.

Similarly, I pointed out, in my answer to the question, ‘What brought about the shift of the Chinese spatial perception of time?’, that the written language after the May 4th Movement in China, strengthened and consolidated the monumental paradigmatic shift in the spatial perception of time in so large a population. What initiated the shift might be contact with western culture. What made the shift successful was, to a large extent, due to the introduction of a colloquial, written language which facilitated the introduction of western concepts. The shift has enhanced the complexity of the Chinese language with the creation of two diametrically opposite views of time in spatial terms. Since then the language has been realigning, in the sense of a drift, its spatial metaphors for time in accord with the perception of the speakers.

In conclusion, I wish to propose that, while the mastery of data from thousands of languages has invigorated an erstwhile condemned research on variations of structural complexity of languages, another new and fertile arena for the investigation of language complexity may lie in the interaction between written language and spoken language.

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