A Contrastive Study of Temporal-Spacial Metaphors in English, French and Chinese

Shuyu Chen

Northeastern University, Shenyang, China

1321405318@qq.com

Abstract: Due to the intangibility and abstractness of time, people from different cultures, though with disparate views on time and space, are universally inclined to project spacial metaphors on temporal concepts. Nonetheless, most research has put more emphasis on the bilingual contrastive study than the multilingual one, leaving the generalizability of their research findings questioned. Guided by Lakoff's conceptual metaphor theory, this paper analyzes both static and dynamic temporal-spacial metaphors in English, French and Chinese with both lexicographical data and corpora data as proof. Moreover, through contrasting the six image schematic concepts in the three languages, namely, UP, DOWN, LEFT, RIGHT, FORNT, and BACK, this paper notices the most conspicuous disparages between the three languages exist in their vertical and horizontal representations of temporal-spacial metaphors. Additionally, through comparison, this paper unveils the similarity of the three languages with regard to their use of both the moving-ego, the moving-time and the temporal-sequence models in their metaphorical systems.

1. Introduction

Since the conceptual metaphor theory was first proposed by George Lakoff and Mark Johnson in *Metaphors We Live By*, the cognitive perspective of metaphors has been consolidated and amplified. The definition of metaphors has been transformed from the rhetoric tropes to the association of one domain (as target) with another (as source) [1]. According to Lakoff and Johnson, metaphors play an indispensable role in human cognition, providing us with a path of construing abstract concepts, a means of explaining the inexplicable and a fruit of human embodied experience. As human beings cannot express what they have no conception or perception of, psychologists, philosophers and linguists have reached a consensus that human languages are deeply grounded in our embodied experience and interaction with the outside. Some fundamental and ubiquitous concepts, such as time and space, are also subject to the metaphors construed by image schema, which is a recurring and dynamic pattern of human perception that shapes and integrates embodied experience (Johnson, 1987) [2].

According to Johnson and other linguists like Mandler, image schema is pre-conceptual, which originates from human's sensory experience and exists before the appearance of conceptual representation [3]. Image schema to some degree visualizes the invisible concepts to connect learners

with a more sensible and understandable surrounding so as to develop their cognition and help them get involved in a language community. As for temporal-spacial metaphors, many cultures tend to map spacial concepts onto the temporal ones, because biologically infants perceive this world with the application of their embodied experience, in which process their spacial concepts develop first to conduct self-positioning so that they can survive under the law of the fittest.

Image schema as the source domain of many metaphors has contributed to the construction of human metaphorical concept system which involves ontological metaphors, structural metaphors, and orientational metaphors. Based on human's physical perception, orientational metaphors give a co-occurrence of two different experiences, which project the fundamental spacial concepts onto other domains, such as the temporal-spacial field. For instance, Haspelmath has conducted an orientational metaphorical research in 53 different languages and found the subjects in all these languages had been proved to hold an inclination for temporal-spacial metaphors [4]. In this cognitive process, the spatial images and their internal logic can be preserved in the temporal domain. To further probe into the motion curve of this mental parallelism, some scholars, like Ronald W. Langacker, have resorted to image schema, which makes abstraction concrete [5]. According to him, image schema is mainly composed of three parts: the trajector (TR), the landmark (LM) and the path (PATH). Briefly speaking, LM is a reference to determine the trajector's orientation, and the path is the way through which the trajector moves to the landmark. As temporal concepts can be both static and dynamic, image schema can not only depict the motion path of temporal metaphors, but also portray the relative positions between the source domain and the target domain.

Currently, there are three major perspectives to understand the linkage between orientational metaphors and temporal concepts (Chen & Huang, 2006) [6]. First of all, the Metaphorical Structural View, or the Metaphorical Mapping Theory, illustrates that people employ spacial representations to depict time, because they are more familiar with the concrete and sensible spacial concepts which can be acknowledged in embodiment at a pre-conceptual stage. Secondly, the Structural Parallelism Theory asserts time and space have internal resemblance, so a large variety of cultures have applied temporal-spacial metaphors by sheer coincidence. In this sense, time and space are endowed with independent and paralleled systems where neither is constructed on the basis of the other. Thirdly, the Structural Mapping View believes the resemblance of time and space had first been noticed by human beings in a relatively earlier stage, and then the two concepts were mutually construed and intricately intertwined.

With the above-mentioned theories as reference, this paper recognizes the similarity of temporal-spacial metaphors in the three languages lies in their employment of both the moving-ego, the moving-time and the temporal-sequence models, and generally classifies their disparages as the vertical and horizontal distinction. Through analyzing the up-down coding, the front-back coding and the left-right coding systems in the three languages, this paper delves into the astonishing similarity of human cognition and the interesting distinctions of the temporal-spacial metaphors in different languages. The major research questions are listed as follows:

(1) What are the differences of temporal-spacial metaphors between English, French and Chinese?
(2) Do these three languages have metaphorical similarities?
(3) How to explain these differences and similarities from a cognitive perspective?

Data Resources:
(1) Corpus of Contemporary American English (COCA)
(2) Corpus Linguistics at BFSU
(3) Dictionnaire Le Robert [7]

2. The Moving-Time and the Moving-Ego Models

Ubiquitous as temporal-spacial metaphors are, different cultures still have disparate uses of them. Having drawn reference from Lakoff's metaphorical models, Vyvyan Evans proposed three major cognitive models for time, namely, the moving-time model, the moving-ego model, and the temporal-sequence model [8]. The first two are ego-based which take the experiencer as a reference of the present, whereas the last model is time-based which marks the sequence of different temporal points. In the moving-time model, the ego is static and time is moving toward the ego from the future, while in the moving-ego model the experiencer actively heads for the future with his past left behind. In the temporal-sequence model, time is not determined by the experiencer, but referred to another temporal point, which thus creates the expressions like "the day before yesterday" in English, 前天 in Chinese and "avant-hier" in French. Here are some examples respectively:

A. The Moving-Time Model

(1) Christmas is approaching.

(2) L'hiver touche à sa fin, nous attendons l'arrivée du printemps. (Winter is coming to the end, and we are waiting for the arrival of spring.)

(3) 他们迎接黎明的到来。(They welcome the arrival of the dawn.)

B. The Moving-Ego Model

(1) I look forward to your reply.

(2) Nous nous rapprochons d'un avenir européen commun. (We move towards a shared European future.)

(3) 我们向未来扬帆起航。(We set sail for the future.)

Apparently, all these languages are endowed with the three temporal-spacial models, but different from Chinese, English and French are more inclined to use FRONT ("devant" or "avant" in French) to represent the future, and BACK ("derrière" or "après" in French) to refer to the past. For instance, in English there exist the future-oriented expressions like "She has an incredibly bright future in **front** of her." and the past-based expressions like "My school days are far **behind**." In French, there are some future-oriented expressions like "Le développement futur **devant** nécessairement être un développement sans émissions nettes de carbone." (The future ahead is definitely the carbon neutral development.), and the past-based expressions like "Il ne faut pas regarder **derrière** soi. (Don't go back and forth; Don't be overtaken by misgivings and fear.) However, as for Chinese, the theories above are not solid and rational enough to explain the idiom such as 前无古人，后无来者 (Before, no ancestors can compare with it, and after, no posterity can surpass it; Unprecedented in history, unsurpassable for posterity), in which Chinese uses 前 (front; before) to denote the past, whereas applies 后 (back; after) to refer to the future. Therefore, something more specific in temporal-spacial metaphors, as shown in the two figures below, still require further exploration.
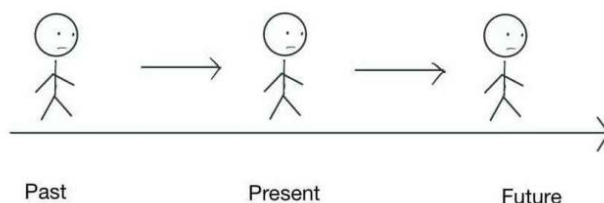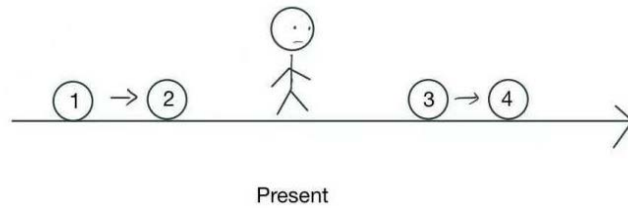

Figure 1: The Moving-Ego Model

Figure 2: The Moving-Time Model

The consensus can be reached that no matter what is moving, the motion departure lies in the past and the future holds its destination. Therefore, the perception of the moving-ego model can be easily accessible in our common sense. As shown in the first picture, the ego is moving towards the future, so the things ahead represents the future whereas the things left behind displays the past. In the second picture, it is time which heads for the future, so what flows faster can be experienced earlier by the ego and is capable of representing the past in the moving-time model. For instance, the ego hasn't witnessed the object 1 and the object 2, so they signify the things in the future. As the object 1 are farther away from the ego than the object 2, the object 1 will showcase after the object 2. On the contrary, the object 3 and the object 4 denote the past which the ego has already experienced, so they denote the past where the farther object 4 happened before the object 3. This explanation of the moving-time model clarifies the use of 前 in reference to the past in Chinese.

Nevertheless, some expressions like "ex-wife" in English, "ex-épouse" in French and 前妻 in Chinese are different from the situation mentioned above, for all of these expressions have the meanings of happening or existing before in sequence or in order. Actually, these expressions are more appropriate for the temporal-sequence model. However, what remains questioned is that the denotation of "ex-" in French and English doesn't represent as a functional equivalent to the Chinese character 前. The prefix "ex-" in both English and French originates from the Latin preposition "ex" indicated as OUT or OUT OF, whereas in Chinese this meaning of "previous" has been signified as FRONT. Insofar, the prefix "ex-" in English and French can be explained as the things getting out of the present time, in which time is imaged as a container, but in Chinese, 前 refers to the things which happened before in sequence, showing a resemblance of "before" in English and "avant" in French. Here are some examples in the three languages:

(1) I have used that recipe for years and my mother in law has used it for 35 years **before**.

(2) La Banque de France a émis une nouvelle série de billets bien des années **avant**. (The Bank of France has issued a set of new notes years before.)

(3) 我很多年**前**就认识他。(I knew him long age.)

In the same way, the similarities between English, French and Chinese in the temporal-sequence metaphors can also be discovered in "after" (English), "après" (French) and 后 (Chinese) to refer to the future. The examples are shown as follows:

(1) We will arrive soon **after**.

(2) **Après** quoi, nous pourrons continuer le processus. (After that, we can continue our journey.)

(3) 自此之**后**，没人再见过他。(No one saw him again from then on.)

As a conclusion, whether to apply FRONT to the future or to the past depends on the reference employed in temporal-spacial metaphors. In the three temporal-spacial models, if we take the present time as a reference (the moving-time model), the concept of FRONT will represent the past, as time has already been experienced by the experiencer. Or if we consider the experiencer as a reference (the moving-ego model), the FRONT he or she is facing with will denote the future. What's more, if we view time in the sequence of events (the temporal-sequence model), what happened before the present

is indicated as the past with the expressions of FRONT, and what will happen after the present displays the concept of BACK.

3. The Vertical and Horizontal Temporal-Spacial Metaphors

Temporal-spacial metaphors have been detected in virtually all extant languages, but certain metaphorical mapping is endowed with disparate features in different languages. Some scholars like Ning Yu has proposed the concept of three dimensions of time which are directly congruent with the spacial concepts [9]. According to him, the one-dimensional time is universally applied in human cognition, whereas the two-dimensional time which represents the reciprocating of time and the three-dimensional time which moves in a screw type are both rarely employed in languages all over the world, for the perception of these two types still require further research and scientific verification in the future. Therefore, this paper pays major attention to the one-dimensional time in English, French and Chinese to delve into their spacial conceptualization which can be generalized as the vertical dimension and the horizontal dimension, and the horizontal dimension can be further classified as the longitudinal dimension and the lateral dimension. Vertically, the temporal-spacial metaphors include the prepositions like "up" and "down" in English, "sur" and "sous" in French, as well as 上 and 下 in Chinese. Horizontally, the longitudinal dimension signifies the front-back coding presented as "avant" and "après" in French, as well as 前 and 后 in Chinese, whereas the lateral dimension indicates the left-right coding displayed as "gauche" and "droite" in French, as well as 左 and 右 in Chinese.

3.1 The Up-Down Coding

As shown in the examples mentioned above, the ubiquitous use of horizontal temporal-spacial metaphors worldwide has to some degree verified the cognitive commonplace of different cultures, but the vertical temporal reference is rarely applied and uncommonly conceptualized. Among the few cultures that frequently use vertical temporal-spacial metaphors, the Chinese interpretation of time is rather distinctive. As shown in the figure 3, Chinese people believe time is flowing in an up-down pattern in which "up" represents the past, whereas "down" denotes the future.
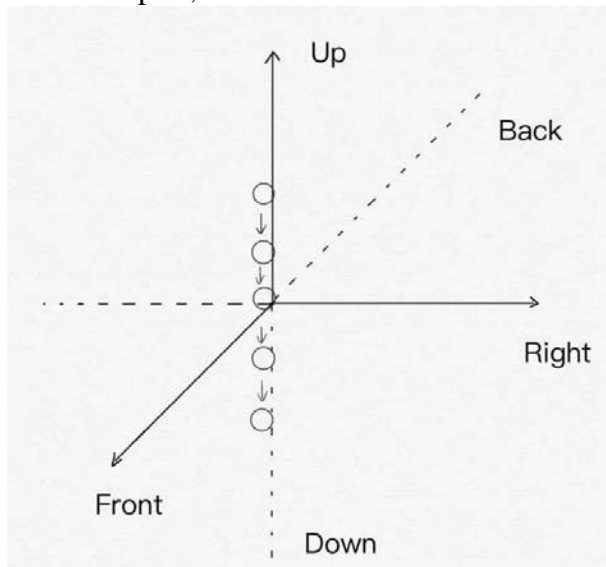

Figure 3: The Up-Down Coding of Time

Based on Slobin's (1987) "thinking-for-speaking" hypothesis, Boroditsky (2001) believes Chinese speakers have a vertical construal of time distinguished from English speakers [10]. Some studies, such as eye movement experiments, have been conducted to examine whether language expressions can reflect the cognitive process of Chinese people or not. Also, many researchers accentuate the effectiveness of gestural presentations with a hypothesis that if Chinese speakers do have a habitual vertical axis in conception, they will gesture about time vertically (Hostetter & Alibali, 2008) [11]. According to the research of Zhang & Yu et al, when the Mandarin-English bilinguals were asked to respond to the time questions in vertical, horizontal and temporal schemes, they reacted faster with regard to the vertical priming terms, which showcases their inclination and tendency of using vertical time scheme [12]. Another research conducted by Song & Zhang et al adopted the spacial Stroop task to examine the cognitive facilitation of the vertical time metaphors in Chinese [13]. The experiment used times series as clues and arrows as targets which were placed on the top or the bottom of the screen. The participants were asked to determine the directions of these arrows which could be either congruent or incongruent with the time series displayed to test the reaction time of the participants, which thus explored the vertical conception of time and space in the visual and motor modality. According to this experiment, the consistency of vertical temporal-spacial reference appears completely in the visual modality, whereas in the motor modality, it showcases only when the words in a relatively forward position of time series were processed. Therefore, current studies have proved that vertical temporal-spacial metaphors are influential both in cognition and conception.

As for the vertical temporal-spacial metaphors in actual use, Boroditsky (2008) has conducted an experiment in which the participants were asked to give sequence to several events. He found about 42% of Chinese speakers had chosen to queue them in a vertical dimension, whereas only 5% of English speakers had employed a vertical timeline [14]. In Chinese, some phrases like "上星期/下星期" (last week and next week), "上个月/下个月" (last month and next month), and "上午/下午" (forenoon and afternoon) are all coded in a vertical timeline, whereas in English, though some phrases like "pass down" and "hand down" exist, the frequency of certain usages cannot be compared with their horizontal counterparts. In French, however, even the expressions like "pass down" can be hardly detected, for it's a verb-framed language independent of "satellites" which, according to Talmy, include the closed words such as the prepositions of locality in English [15]. Therefore, the denotation of "hand down" has been substituted by some Verbes Pronominaux (French) like "se transmettre de génération en génération" (be handed down from generation to generation).

Due to the generalization of vertical temporal metaphors in Chinese, it's of vital importance to delve into its internal logic which mainly contains four rational explanations:(1) The ancient Chinese handwriting pattern; (2) The motions curve of sunrise and sunset; (3) The traditional Chinese concepts of honoring the people with higher positions; and (4) The movement of rivers from the top to the bottom.

Some scholars have associated the Chinese top-down handwriting pattern with its vertical temporal metaphors, for the reading and writing sequence can imperceptibly influence the visual and motor cognition of people, which thus helps fashion the temporal expressions in that culture (Dong, 2014)[16]. Though the top-down handwriting has been displaced by the left-right pattern with the dereliction of bamboo slips as writing carriers and the reform of writing in the New Culture Movement, the top-down cognition has still been rooted deeply in Chinese cultural blood, and currently, the top-down reading pattern of mobile phones has to some degree strengthened the vertical cognition of Chinese people. However, opponents consider it invalid to explain the reason why modern Chinese people, though more accustomed to the left-right handwriting, still shows a tendency of vertical temporal cognition. As for its first explanation, we can resort to the "collective unconscious" proposed by Carl Jung, which signifies certain unconscious cognition inferred from archaic myths and religions, implicitly influencing the posterity of a culture [17]. For another explanation, some scholars, like Lan

(1999), assert the temporal cognition of Chinese people is related to its agricultural history which has vested Chinese people with more opportunities to directly sense the vertical motion of time [18]. Nonetheless, we cannot ignore the fact that people in other cultures also have access to the sun movement, but the vertical temporal metaphors are not universally applied worldwide. Therefore, the third hypothesis has been proposed that the vertical temporal metaphors originated from ancient people's respect towards those with higher positions, so the up-direction was considered as honorable as China's considerably long history (Zhou, 2015) [19]. Nevertheless, this explanation is more likely to define the vertical temporal reference as a cultural convention, rather than a kind of embodied cognition deeply rooted in human psyche, which lacks solid evidence as proof. So comes the fourth explanation which connects the vertical temporal reference with the river flow (Liu, 1993) [20]. As China is geographically installed with more than two thirds of the mountainuous regions, the vertical flowing of rivers appears more frequently than that of the European countries where people have witnessed more of the horizontal flowing of rivers. This explanation seems to accommodate to the embodied experience of both ancient and modern Chinese people, but it's still premature to make an assertion. What makes Chinese temporal referential system so distinctive still demands further exploration.

3.2 The Front-Back Coding

Owing to the one-dimensional attribute of time, the events which exclusively belong to a single person or context are not capable of happening at the same time, so they are endowed with a temporal sequence, appearing before or after the intrinsic event. According to the moving-ego and moving-time models mentioned above, the congruence between the before-after expression and the front-back image schema depends on the reference people choose in describing time. Whether to use FRONT to denote the future or to the past, the linear structure of time in this case undoubtedly determines the irreversibility of time which universally exists in English, French and Chinese. Examples are shown as follows:
(1) Time will never turn back.
(2) Le temps perdu reviendra pas plus. (If time flows away, it will never come back.)
(3) 前事不忘，后事之师。(Learn from the past mistakes)
Here is a figure for the illustration of the image schema of the front-back coding:
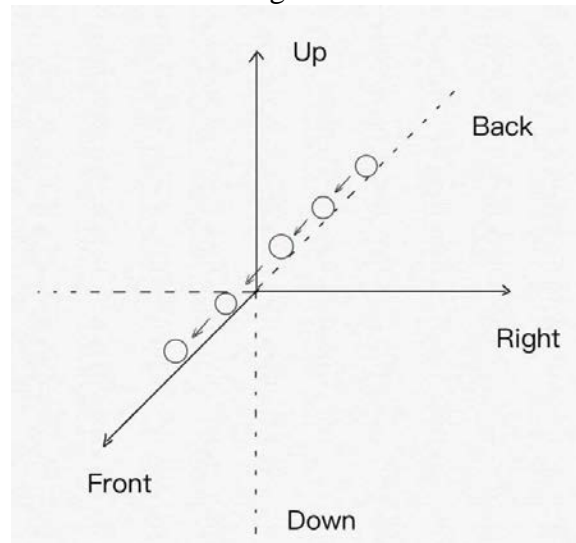

Figure 4: The Front-Back Coding of Time

In the front-back coding, people put less emphasis on the reciprocating of time, such as the circle of seasons, but pays more attention to the once-in-a-life-time feature of temporal concepts. Scientifically speaking, no one can cross the boundary of time and return to the past, which gives explanation to the past-as-front metaphors, for what we have witnessed has already passed away. In this way, similar expressions can be found in all the three languages. For instance, "the day before yesterday" in English, "avant-hier" in French and 前天 in Chinese. They all point to the timeline with single direction in temporal series. However, the temporal referential system in Chinese still distinguishes itself from the other two languages. Generally speaking, English and French hold three levels of front-back coding. For instance, in English there exist "the day before yesterday", "yesterday", "today", "tomorrow" and "the day after tomorrow". In French, there exist "avant-hier", "hier", "aujourd'hui", "demain", "après-demain". In Chinese, there is a further level of front-back coding in temporal reference which have been used frequently. That is, 大前天 (Three days ago), 前天(The day before yesterday), 昨天 (Yesterday), 今天 (Today), 明天 (Tomorrow), 后天 (The day after tomorrow), 大后天 (Three days later).

Disparages of the front-back coding in the three languages showcase not only in the different levels of temporal referential systems, but also in different temporal concepts of their native speakers. Currently, the research on temporal-spacial metaphors is no longer confined to the mere hypothesis stage, but has also been verified by many empirical studies. For instance, Lera Boroditsky and Vicky Lai conducted an experiment to delve into the disparages between Chinese and English people in conceiving and mapping time and space [21]. They classified the subjects into three groups: English monolinguals, Mandarin monolinguals, and English-Mandarin bilinguals. Each group was split into two smaller groups so that a condition group can be at work. In this experiment, the subjects was asked two questions: (1) If a meeting scheduled on Wednesday was moved forward by two days, when would the meeting hold? (2) What time a clock would say if it was moved forward one hour from 1:00 p.m.? In the first case, the subjects could say Monday or Friday. And in the second, they could say 12:00 p.m. or 2:00 p.m.. According to the results, English monolinguals were more likely to say "Friday" or "2:00 p.m.", which indicates they have interpreted the concept of "forward" as the future with a moving-ego perspective, whereas Chinese monolinguals preferred "Monday" and "12:00 p.m.", which indicates a subconscious conceptualization of time with a moving-time perspective. As for English-Mandarin Bilinguals, though the questions were asked in English in the first task and the second in Mandarin, they were more inclined to use moving-time model than English Monolinguals, and more inclined to apply the moving-ego model than Mandarin Monolinguals, which considerably verifies the reciprocity and interaction between L1 and L2 in these Bilinguals.

3.3 The Left-Right Coding

Though the explicit left-right coding can be rarely detected in languages all over the world, it has still subconsciously influenced the temporal cognition of people with the left-right handwriting. Studies have proved that the subjects judged the temporal attributes of the given words faster when the past-based words were presented on the left side of the computer screen (Santiago, Lupiáñez, Pérez, & Funes, 2007) [22], implying the correlation between people's temporal cognition and their writing direction. Studies in this territory have not been confined to a single language experiment, but also been elaborated by comparative studies. For instance, according to Fuhrman & Boroditsky (2007), English speakers with a left-to-right writing system are more accustomed to referring the left direction to the past and the right one to the future, but for Hebrew speakers with a right-to-left writing system, the situation reverses [23]. Here is a figure of the left-right coding:
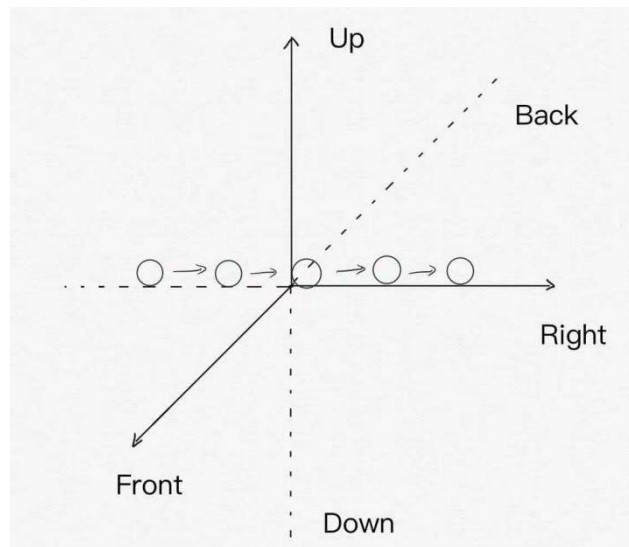
Figure 5: The Left-Right Coding of Time

According to Vallesi *et al*. (2008), there exists the left-right congruency effect of the stimulus-response mapping observed in these temporal studies, which suggests that if the stimulus is congruent with the required response in the left-right coding, the "overt motor response" will be activated and people will react subconsciously as directed [24]. As a proof, an experiment conducted by Rolf Ulrich & Claudia Maienborn has tested the congruence between the temporal cognition and the left-right coding based on the explicit signals of motor responses [25]. When a fixation cross was shown in the middle of the screen and some sensible or nonsensical sentences appeared successively, the subjects were asked to press the left shift key with their left index fingers to denote the past or to the future. The researchers recorded the reaction time of the subjects in determining the temporal reference of the subjects either consistent or inconsistent with the left-right coding in their mind. Then, the conclusion has been reached that the left-right mental timeline does exist and makes a difference in people's motor responses. Though expressions in languages can be hardly navigated, we can still find some implicit forms in different languages. For instance, in Chinese there is an expression of 左手过去，右手未来 (In your left hand lies the past, and in your right hand is the future). All in all, consensus can be boldly reached that the left-right coding cannot be dissociated from human's cognition.

4. Conclusion

This paper has conducted a relatively comprehensive research on the temporal-spacial metaphors in English, French and Chinese, comparing the differences and similarities of the linguistic representations in the three languages and explaining these surface discoveries from a cognitive perspective. As for the metaphorical similarities, this paper probes into the moving-ego, the moving-time and the temporal-sequence models in English, French and Chinese so as to explore the similarities between these languages in employing all the models mentioned above. As for their metaphorical differences, this paper categorizes the temporal referential system into three axis: the up-down coding, the front-back coding, and the left-right coding. More expressions with up-down coding have been shown in Chinese than the other two languages, which has initiated a variety of explanations without a final verdict. In contrast, the front-back coding is universally employed in the three languages, but all of them have shown special attributes. The left-right coding, though with a lack of actual use in the three languages, has exerted profound influence on people's cognition, as

proved by many experiments. Nevertheless, this paper hasn't supported its conclusions with more evidences from other languages and also, experiments haven't been operated in this research, which all call upon further exploration and contemplation. All in all, if this paper could enlighten the readers a little, it would be considered as a modest contribution to further study in this territory.

Word Count: 4606

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