

# Spatial Cognition of Chinese “Shang/Xia” and English “Up/Down”

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In spatial cognition, there are great differences between Chinese “shang/xia” and English “up/down”, being obvious subjectivity in both of them. While expressing the same spatial concept, Chinese “shang/xia” does not make a specific spatial dimension distinction but usually focuses on the two-dimensional plane of the “ground” and neglects the features of “point”, “line”, or “volume”. Therefore, when expressing the specific spatial relations, Chinese “shang/xia” has relatively broader semantic meanings and a wider range of spatial concepts. In terms of internal symmetry of language, there exists semantic asymmetry between Chinese “shang” and “xia”, and “shang” has a broader scope of application than “xia”, which is the result of the interaction of linguistic prominence and principle of linguistic economy. The semantics of English “up” and “down” in spatial relations are basically symmetrical.

*Keywords:* spatial cognition, Chinese “shang/xia”, English “up/down”

## Introduction

Lakoff and Johnson (1980) believed that the concept of space is the basis for understanding other concepts (p. 14). In the process of getting to know the world, people constantly perceive and understand the spatial relations between objects. “Up/down” is the cognition of the vertical spatial orientation of space. The concepts of spatial dimension expressed by Chinese “shang/xia” and English “up/down” have both similarities and significant differences. This linguistic and cognitive phenomenon deserves extensive attention and in-depth study by scholars.

In this paper, the corresponding English words of Chinese “shang/xia” are “up/down” determined by corpus word frequency retrieval. Corresponding to Chinese “shang/xia”, English can be “up/down”, “over/under”, and “above/below”. Therefore, in terms of English words corresponding to Chinese “shang/xia”, this paper does word frequency retrieval of corpus. The retrieval results in BCC (<http://bcc.blcu.edu.cn>) and Wordcount show that “up/down” appears relatively frequently, so this paper selects English “up/down” as the corresponding comparative research object with Chinese “shang/xia”.

The Chinese and English sentence examples in this paper are selected from CCL, BCC, *Advanced Learners' English-Chinese Dictionary* (6th edition), the *Contemporary Chinese* (Chinese-English edition) (2002 Supplement), and *Youdao* electronic dictionary.

### Cognitive Theories of Physical Space

There are two cognitive theories of physical space applied in the paper. In Ungerer and Schmid's(1996)prominence view, the choice and arrangement of information in language structure is determined by the prominence of information. Figure-Ground Theory is based on the principle of linguistic prominence. Talmy(1978) believed that “figure” is a positioning concept, while “ground” is the concept of positioning “figure”.Levinson's Frames of Reference Theory (2003) explains the referential spatial relations and holds that it is related to the observer's perspective.

### Spatial Cognition of Chinese “Shang/Xia” and English “Up/Down”

In ancient and modern Chinese(<http://www.cidianwang.com/shuowenjiezi>; <http://www.cidianwang.com/guhanyu>), the basic meaning of Chinese “shang/xia” is “up; higher/down, lower”. The basic meaning of English “up/down” in *Oxford Advanced English-Chinese Dictionary* (6th edition) is “adv. towards or in a higher position/adv. to or at a lower place or position”. According to the Online Etymology Dictionary (<http://www.ctymonline.com,up/down>), other parts of speech and functions of “up/down” all originate from their adverbial parts of speech and functions. It can be seen that the basic concepts of Chinese “shang/xia” and English“up/down”are pure spatial concepts.

### Static Space of Chinese “Shang/Xia” and English “Up/Down”

According to the spatial relationship between “figure” and “ground”, the static spatial relations represented by Chinese spatial word “shang/xia” can be divided into three categories: distance relation, contact relation, and inclusion relation, while the spatial relation represented by English “up/down” is only distance relation.

**Distance relation of Chinese “shang/xia” and English “up/down”.** Chinese “shang/xia” and English “up/down” can indicate that the “figure” and the “ground” have neither contact or connection relationship, nor supporting and being-supported relationship, the distance between the “figure” and the “ground” is close to each other, but also far apart, and that this distance relation can be described as vertical distance relation, or non-vertical distance relation. But English “up/down” also shows a horizontal distance relation, which cannot be found in Chinese “shang/xia”.

Both Chinese “shang/xia” and English “up/down” can express the vertical distance relationship between the “figure” and the “ground”, such as:

- (1) 灯悬挂在桌子上(shang)方。(A lamp hung over the table.)
- (2) 夏天我们经常露宿星空下(xia)。(In summer, we often slept under the stars.)
- (3) The sun was already up when they set off.
- (4) The second house that I grew up in was down.

Sometimes, the distance relationship between the upper and the lower in Chinese is the non-vertical distance relationship between the “figure” and the “ground”, such as:

- (5) 我们的办公室在理发店的楼上(shang)。(Our office is above the hairdresser's.)
- (6) 他们住在下(xia)一层楼。(They live on the floor below.)

Unlike the non-vertical distance relation of Chinese “shang/xia”, the non-vertical distance relation of English “up/down”is inclined distance relation; usually the “figure” is located on the inclined path upward or downward, such as:

- (7) About halfway up the small hill, Obama stopped and realized that something was missing.

(8) There is a village a mile down the mountain from here.

English “up/down” also extends from the original meaning “in (or toward) a higher or lower physical position” to “in a direction regarded as being toward or near the upper end or part of”, that is, to express the relationship of horizontal distance. “Up” and “down” have expanded from vertical distance to horizontal distance. “Down” can represent the concept of two-dimensional “plane” in static space, like “on a paper”, “on a list”, and “Did you get that down?” It is a typical use of the planarization in distance space in English “up/down”. There is no such use of horizontal distance relation in Chinese “shang/xia”.

**Contact relation of Chinese “shang/xia”.** The original orientational meaning of Chinese “shang/xia”, deriving from its original meaning of “in a higher/lower position”,<sup>1</sup> is “attached to or above the outer surface of an object” or “attached to or under the surface”. It is plane contact, which means that the “figure” is completely in contact, connects or overlaps with the “ground”. It is because in the process of understanding the spatial contact relations, with the participation of the observer, the choice of the description language is influenced by the subjective choice tendency of the observer. In English “up/down”, there are no such contact relations. For example:

(1) 院子很小，靠着南墙根有棵半大的小枣树，树尖上 (shang) 挂着十几个半红的枣儿。(The yard was very small. By the southern wall grew a young date tree with a dozen fat red dates on its top branches.)

(2) 河岸上 (shang) 的柳枝轻摆。(Trailing willow branches stirred along the river bank.)

(3) 他的身体在被单下 (xia) 颤抖。(His body stirs beneath the sheets.)

The choice of different types of reference objects will give different meanings to the Chinese spatial word “shang/xia” in different scenes. Sometimes, “shang/xia” can even express the same position relationship, such as:

(4) 天花板上 (shang) 有只苍蝇。(There is a fly on the ceiling.)

(5) 天花板下 (xia) 有一个投影仪。(There is a projector under the ceiling.)

It shows that linguistic representation of the spatial word has strong subjectivity. It is just as Langacker (1991) said: In a certain situation, although the selection of an entity as a “figure” is decided by some objective characteristics, the figure-ground relationship is not inherently unchanged in the situation, but the result of human understanding (p. 308).

When expressing the part of the body or the contact relation without emphasizing the upper and lower positions but emphasizing the meaning of “attachment”, people usually choose Chinese “shang” but rarely “down”, such as “穿在脚上 (wearing on the foot)”, “写在纸上 (writing on the paper)”, “长在手上 (growing on the hand)”, and so on. There are no opposite expressions by using “xia”. In the cognitive activities of the observer, the observer takes himself as the reference point, and regards the “foot”, “paper”, and “hand” as a two-dimensional plane, which also shows a strong subjectivity.

In the cognitive process of “shang/xia”, the concept of “xia” is more dependent on the concept of “shang” and “shang” takes the place of “xia” to express the concept of “xia” because in people’s subjective experience in the cognitive level “shang” is more prominent and people tend to get the concept of “shang” first.

In the spatial reference orientation relation of “shang/xia”, Chinese reflects the change of perspectives and linguistic prominence which influences people’s subjective choice of language. The establishment of the spatial relation of “shang/xia” depends on the position of the reference object, so the selection of the reference object

<sup>1</sup> See <http://www.cidianwang.com/shuowenjiezi/shang4559.htm>.

is very important to the spatial relations. The different perspectives of the observer will cause the change of spatial relations, so it has very strong subjectivity.

**Inclusion relation of Chinese “shang/xia”.** Chinese “shang/xia” can indicate that the “figure” is in the “ground”, which means a three-dimensional spatial inclusion relation is constituted. However, there is no such spatial relation in English “up/down”.

- (1) 墙上(shang)有个小洞。(There is a hole in the wall.)
- (2) 雄鹰在天上(shang)翱翔。(The eagle is soaring in the sky.)
- (3) 那条船沉在水下(xia)。(The ship sank under the water.)

The above example sentences show the inclusion relation of “shang/xia”. The concept of “shang/xia” in the example sentences is similar to that of Chinese “li” (“in” in English). Ge Ting (2004) believed that “plane” and “volume” are the main differences between “shang” and “li” in Chinese. “Shang” emphasizes the concepts of open space and plane, while “li” emphasizes the concepts of closed space and container. However, due to the different closeness of “li”, in physical space, when the boundary mark has the semantic characteristics of [+bottom], [+three-dimension], and [+side], the semantics of “shang” and “in” overlap, such as vehicles, trains, airplanes, and so on. The choice of Chinese “shang” or “li” depends on whether the observer focuses on the two-dimensional “plane” or the three-dimensional “container” perspective.

Clark (1973) drew the conclusion through experiments that if two entities A and B have bearing surface, then B is above A and if B is a container, then B is in A. In the former case, the preposition “on” should be used, and in the latter case, the preposition “in”. For specific means of transport, we can easily find that trains, cars, aircraft, and so on not only have the physical attributes of “containers”, but also have the attributes of “bearing plane”. From the functional characteristics of vehicles, the most prominent role is to carry passengers or goods on the “bearing plane”. The features of “bearing plane” are prominent, while features of “container” are not as prominent as the “bearing plane” features, and are in a non-prominent position. Because of the prominence of the feature of “plane” of vehicles, “Shang” is used in Chinese to express its inclusion relation with loads. When people want to emphasize the “container” characteristics of vehicles, they can also use Chinese “li” (“in” in English) to express this inclusion relation. Therefore, the metaphorical function of Chinese spatial words can be embodied in the three-dimensional physical space such as transportation vehicles. As a result, the “bearing plane” of the three-dimensional physical space is put in a prominent position.

In the above-mentioned static spatial relations of Chinese “shang/xia” and English “up/down”, dimension relation is the most typical one, followed by the contact relation and inclusion relation of Chinese “shang/xia”. This is because the dimension relation best reflects the up-down spatial relation in the basic meaning of Chinese “shang/xia” and English “up/down”. The up-down spatial relation embodied in the contact relation in Chinese “shang/xia” has been relatively weakened, reflecting the “point”, “line”, and “plane” contact relation, and the inclusion relation embodies both up-down relation and in-out relation. The concept of “li” (“in” in English) in Chinese “shang/xia” is characterized by subjectivization.

### **Dynamic Space of Chinese “Shang/Xia” and English “Up/Down”**

Chinese “shang/xia” and English “up/down” can also reflect dynamic spatial relations. When Chinese “shang/xia” is used as a verb, it means “the change of the spatial position of the action”. At this time, it still depends on its basic meaning of “higher/lower”, getting the meaning of “from a lower position to a higher position/from a higher position to a lower position”, such as:

(1) 后来闪电逐渐开始跟着山姆，上(shang)楼，下楼(xia)。(But slowly, as the days went on, Lightning started following Sam—up the stairs, down the stairs.)

(2) 小船借着风在后面的推动，顺流而下(xia)。(The little boat rolled down the river, with the wind behind it.)

When English “up/down” means “to a higher/lower position”, it reflects the dynamic spatial relation based on the relationship between the “figure” and the “ground”. As adverbs or prepositions, “up” and “down” always collocate with verbs. The dynamic spatial relation in Chinese “shang/xia” and English “up/down” is still distance relation, which can be divided into vertical distance relation, non-vertical distance relation. In English, there is horizontal distance relation, which cannot be found in Chinese. For example:

(3) He jumped up from his chair.

(4) The stone rolled down the hill.

(5) She was pacing up and down in front of her desk.

### Spatial Comparison Between Chinese “Shang/Xia” and English “Up/Down”

The cognitive analyses of the above-mentioned spatial relations between Chinese “shang/xia” and English “up/down” can be summarized in Table 1:

Table 1

*The Spatial Comparison Between Chinese “Shang/Xia” and English “Up/Down”*

State	Category	Relation	Shang	Up	Xia	Down
Static space	Relation of distance	Vertical distance	✓	✓	✓	✓
		Non-vertical distance	✓	✓	✓	✓
		Horizontal distance	×	✓	×	✓
	Relation of contact	Point contact	✓	×	✓	×
		Line contact	✓	×	✓	×
		Plane contact	✓	×	✓	×
		Clinging or hanging	✓	×	×	×
	Relation of inclusion	Inclusion	✓	×	✓	×
Dynamic space	Relation of distance	Vertical distance	✓	✓	✓	✓
		Non-vertical distance	✓	✓	✓	✓
		Horizontal distance	×	✓	×	✓

Notes. In the table, “✓” denotes that such spatial orientation relations can be expressed; and “×” denotes that such spatial orientation relations cannot be expressed.

Through the table and the comparative analyses above, it can be seen that Chinese spatial word “shang/xia” expresses more spatial relations than the English spatial word “up/down”. Chinese “shang/xia” can reflect the spatial relations of contact and inclusion, that is, the spatial relation of point, line (one-dimensional), plane (two-dimensional), and inclusion (three-dimensional), while English “up/down” cannot. The horizontal distance relation in English “up/down” does not exist in Chinese “shang/xia”. In reference spatial relations, there is an asymmetric phenomenon in Chinese “shang/xia”, “shang” expressing the attachment relation, but “xia” not.

In static space, Chinese “shang/xia” not only expresses the distance relation between a higher and a lower spatial location, but also has a wider range of semantic extensions. When expressing the concepts of up-down orientation, Chinese does not distinguish specific spatial dimensions. People are accustomed to the cognitive model of “plane” (two-dimensional), that is, they usually focus on the two-dimensional plane of the “ground”

but ignore its “point”, “line” (one-dimensional) or “volume” (three-dimensional) features. Therefore, when expressing specific spatial relations, Chinese “shang/xia” has relatively broader semantic meanings and a wider range of spatial concepts.

In the static space, the “figure” and the “ground”, “point”, “line”, “plane”, “volume”, or the space scope outside the “ground” form a distance, contact, or inclusion relation which reflects the topological meaning of Chinese “shang/xia” and English “up/down”. The distance relation can best reflect the basic meaning of the up-down relation, in which both Chinese “shang/xia” and English “up/down” have shown objectivity. The spatial meanings of Chinese “shang/xia” and English “up/down” do not form a completely corresponding relationship because Chinese “shang/xia” cannot express the horizontal distance relationship as the English “up/down”. The up-down spatial relation in the contact relation of Chinese “shang/xia” has been relatively weakened, and the inclusion relation embodies both “up-down” and “in-out” relations. The “li” (“in” in English) of three-dimensional inclusion expressed by Chinese “shang/xia” is already a subjective concept. In the attachment relation of reference space, Chinese “shang” reflects the change of perspective and linguistic prominence influences people’s subjective choice of language.

In dynamic spatial relations, both Chinese “shang/xia” and English “up/down” can indicate vertical distance and non-vertical distance relations. English “up/down” can also show horizontal distance relation, while Chinese “shang/xia” cannot. In Chinese the position relationship between “figure” and “ground” is paid attention to first, then the action itself, while English pays more attention to verbs, that is, to the action first, and then to the place where the action takes place.

Fourthly, as far as Chinese itself is concerned, the semantic range of the spatial word “shang” is larger than that of “xia”. For example, when expressing static attachment relation, “shang” is often applied instead of “xia” because of the joint effect of linguistic prominence and principle of linguistic economy.

## Conclusion

From the above comparisons, it can be seen that when expressing spatial relations, Chinese “shang/xia” has relatively broader semantic extension and larger range of semantic meanings, while English spatial word “up/down” has relatively narrower semantic scope and more specific representations. Both Chinese “shang/xia” and English “up/down” show certain cognitive subjectivity, but the language representations of spatial relations in Chinese “shang/xia” may be more abstract and subjective than that in English “up/down”.

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