A Cognitive Linguistic Approach to English, Chinese and Thai Spatial Terms: The Case of *on*, *shang* and *bon*

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Abstract

The objective of this article is to compare the English spatial term *on*, the Chinese spatial term *shang* and the Thai spatial term *bon* from the cognitive linguistic perspective. These three spatial terms share a basic meaning of the position on the surface of something. However, the extended usages of these three terms are relatively different. In analyzing the differences between these three terms, sample sentences of English, Chinese, and Thai are collected from three corpora. The corpora used are British National Corpus by Oxford University (2021) for English sentences, Modern Chinse CCL Corpus by Peking University (2021) for Chinese sentences, and Thai National Corpus by Chulalongkorn University (2021) for Thai sentences. Data collected from the corpora are analyzed and discussed. The cognitive linguistic approach is adopted in the discussion. Concepts of spatial relations and meaning, proto-scene, polysemy words, and the semantic network of these three spatial terms are discussed in this article. The result of the analysis can be applied to spatial terms in teaching and learning. Since the difference between languages should be emphasized during

classes, some negative transfers may be prevented. In addition, foreign students will have a better understanding of the terms studied in the foreign language classes.

Keywords: Cognitive, Spatial, *on*, *shang*, *bon*

Introduction

There are ways to express a relationship between two objects in every language. The methods used may vary in each language to talk about these spatial relations, i.e., prepositions, postpositions, adverbs, particles, nouns, verbs, etc. For instance, to refer to a book on the table, in English the preposition *on* is used. In Chinese, the location word *shang* is used. This kind of location word in Chinese is considered as a noun. In Thai, the preposition *bon* is used.

To understand these three spatial terms better, definitions of these three spatial terms are listed and summarized in this study.

The transliteration system used for the Chinese language in this study is Chinese romanization. Initials and finals of pinyin system are used. The Pinyin system is the official romanization system for standard Mandarin Chinese in Mainland China.

The transliteration of the Thai language is from the Royal Thai General System of Transcription. The system is the official system for rendering Thai words in the Latin alphabet published by the Royal Institute of Thailand.

The definitions of *on* as a preposition from Oxford Advanced Learner's Dictionary International Student's Edition 8th by Hornby (2010) are as follows:

1. a position covering, touching, or forming part of a surface: *on the table was a water jug.* 2. supported by somebody or something: *he was lying on his back.* 3. used to show a means of transport*: I came on my bike*. 4. used to show a day or date: *on Sundays*. 5. actions take place immediately after something: *Please report to reception on arrival*. 6. about something or

someone *a book on careers* 7. being carried by somebody; in the possession of somebody: *Have you got any money on you?* 8. being a member of a group or an organization: *to be on the committee* 9. eating or drinking something; regularly taking a drug or medicine: *The doctor put me on antibiotics.* 10. used to show direction: *on the right* 11. at or near a place: *a house on the Thames* 12. used to show the basis or reason for something: *a story based on fact* 13. paid for by something: *to live on a pension* 14. by means of something; using something: *The information is available on the internet.* 15. used with some nouns or adjectives to say who or what is affected by something: *a ban on smoking* 16. to indicate comparison items, which is used as a standard in the comparison, someone or something to be compared with: *Sales are up on last year.* 17. used to describe an activity or a state: *to be on holiday* 18. used when giving a telephone number: *She's on extension 2401.*

The definitions of *on* as a preposition are checked with other dictionaries (Rundell, 2002; Cobuild, 2006; Mayor, 2012) to make sure that *on* can express these meanings.

In the Chinese language, the character *shang* is considered one of the high-frequency characters. Jun (2004) compiled a Chinese character frequency list based on a very large collection of Chinese texts collected from various online sources. The result showed that the character *shang* is in the 16th place of the highest frequency character used in Modern Chinese. Apart from this, *shang* as a location word is considered a high-frequency word (Cai, 2008; Dan, 2009; Lü, 2010; Huang, 2013). S*hang* as a location word can express many meanings; therefore, it is considered one of the most difficult topics for foreign students (Cui, 2000; Lu 2011).

Shang in this article is a noun indicating location. Xiandai Hanyu Cidian (di qi ban) (Modern Chinese Dictionary 7thedition) compiled by Zhongguo Shehui Kexueyuan Yuyan Yanjiusuo Cidian Bianjishi (2016) defines *shang* as a location word as: 1. the location on the surface *lian shang* (on the face) *qiang shang* (on the wall) 2. within the scope of thing or

object *ketang shang* (in class) *hui shang* (at the meeting) 3. in some aspects *shishi shang* (in fact) *lishi shang* (in history).

Liu & Pan (2005) also defined the usage of *shang* as a location word when it is used after nouns as expressing surface, scope, or an aspect. Examples of these usages are *zhuozi shang* (on the table) *zuzhi shang* (in the organization) *sixiang shang* (in terms of ideology) respectively.

Lü (2008) explained *shang* as a location word that the word is used after a noun. The meanings are: 1. the top or surface of an object *shan shang* (on the mountain) *men shang* (on the door) 2. scope, sometimes the meaning is as same as *li* (in) *shijie shang* (in the world) *cun shang* (in the village) 3. aspect *zai zhe ge wenti shang* (on this problem) *shishi shang* (in fact)

In the Thai language, Royal Institute (2011) defines *bon* as a preposition that refers to the location which is in a high place or over like *bon na* (on the face) *mi nangsue wang yu bon to* (there is a book on the table.)

Bandhumedha (2016) categorizes *bon* together with *khangbon* and *nuea* as the words used to show the relation between things and places, which means to be above another thing.

From the abovementioned definitions of these three terms, these terms' meanings can be summarized in table 1.

Table 1

Summary of Three Spatial Terms on, shang and bon Definitions

Definitions	*on*	*shang*	*bon*
a position on a surface	ü	ü	ü
supported by	ü	r	r
a means of transport	ü	r	r
a day or date	ü	r	r
events take place after something	ü	r	r
topics about something or someone	ü	r	r
carried by or in somebody's possession	ü	r	r
member of a group or an organization	ü	r	r

Definitions	*on*	*shang*	*bon*
eating or drinking or taking medicine regularly	ü	r	r
Direction	ü	r	r
located at or near a place	ü	r	r
basis or reason for something	ü	r	r
paid for by	ü	r	r
by means of something	ü	r	r
is affected by something	ü	r	r
comparison item	ü	r	r
an activity or a state	ü	r	r
giving a telephone number	ü	r	r
scope (within a certain area)	r	ü	r
aspect (in some aspects)	ü	ü	r

Note. ü means the spatial term can express this meaning

r means the spatial term cannot express this meaning

From the above definitions of these three spatial terms, we can see that the basic meaning of these three terms refers to the location on the surface of some objects. Despite this same meaning, there are some differences in the extended usage of these terms.

Since there are differences in each language, language transfer is a common phenomenon in language classes. The term's meaning or usages used in one language may be applied to other languages. Such transfer may be a negative one. Even though the concept of space is universal, the methods or terms used in expressing spatial relations may vary in each language. Thus, spatial terms are considered one of the difficult grammar topics for foreign students. EFL researchers also mentioned difficulties for second language learners when they study English prepositions (Celce-Murcia & Larsen-Freeman, 1998; Evans & Tyler, 2005; Wei, 2007; Zhang, 2011; Lorincz & Gordon, 2012; Dallyono, 2019). On the other hand, Chinese location words are also difficult for foreign students (Cui,2000; Cai, 2008; Dan, 2009; Lü, 2010; Lu, 2011; Huang, 2013).

Differences in these languages can cause difficulties like in such cases of an L2 learner of English whose L1 is Chinese or vice versa. As a Chinese language teacher at an international university in Thailand, in which English is a medium of instruction, the case is even more complicated. There is the case of students' error in using the phrase *on campus*. To express this in Chinese and Thai, the spatial terms, which are similar to *in*, are used in both languages; *li* in Chinese and *nai* in Thai. However, students use the term *shang* since they see the word *on* in English.

To point out similarities and differences, the cognitive approach is applied in a comparative study of English, Chinese, and Thai Spatial terms, which are *on*, *shang* and *bon* respectively. Sample sentences of these three spatial terms are collected and analyzed. Sample sentences of *on* are collected from the British National Corpus. Chinese sample sentences of *shang* are collected from the Modern Chinese CCL corpus. Thai sample sentences of *bon* are collected from the Thai National Corpus. From the data analysis, the meanings of these three spatial terms are categorized. Then, the semantic networks of these three terms are formed. Similarities and differences in terms of the meaning they express are summarized. The results from the analysis can be used in these spatial terms language learning and teaching. This applies not only to English language learners whose native language is Chinese or Thai but also to Chinese language learners whose native language is Thai or English or those who have studied English before.

Objective

To compare English, Chinese, and Thai Spatial terms: *on*, *shang*, and *bon* from a cognitive perspective. The cognitive approaches are adopted to find out similarities and differences from semantic networks of these three terms.

Cognitive Approach

Space is the basic concept in cognitive. People use this concept to mention or describe things or objects that exist or are moving around us. Even though the concept of space is universal, the way or method used in expressing spatial relations may differ between languages. To have a clear view of similarities and differences between English, Chinese, and Thai spatial terms: *on*, *shang*, and *bon*, cognitive approaches, which are polysemy approach, spatial relations and meaning, and the proto-scene are adopted in this study.

This study adopted the approach of Tyler and Evans (2003). There are basic assumptions in this approach:

Human uses language to represent ideas or something that exists in the conceptual system. The system involves a conceptual structure such as concepts, scripts, schemas, etc. The structure gives indications of the world by human experience and perception. Thus, conceptual structure is the result of how humans experience and interact with the spatio-physical world.

Conceptualization of spatial relations can be shown in language. People use the concept to express the relation of objects in space. In addition, spatial concepts can be extended to provide non-spatial meaning.

Tyler and Evans (2003) explained that a spatial scene is a conceptualized relation grounded in spatial interaction and experience, involving objects that are related in a particular spatio-configurational way. For example, *the cup is on the table.* The spatial scene described by this sentence is that the cup is attached to or in contact with the upper side of the table. The scene also implies the support function of the table and the cup since the cup may fall down and smash on the floor without this function. Consequently, this kind of meaning can be extended to non-spatial meanings, for example, *you can count on my vote* derives from the meaning of support. From this example, *my vote* supports *you* as *the table* supports *the cup* in another example.

Polysemy Approach

From the abovementioned cognitive approach, we can see that there are extended meanings of the spatial term *on*, which derive from the basic meaning. To find out extended meanings of the three spatial terms: *on*, *shang*, and *bon*, the polysemy approach is adopted.

Tyler and Evans (2003) explained that a polysemy approach suggests that the meanings associated with a spatial particle are related in some way. A linguistic form is paired at the conceptual level, not with a single meaning, but with a network of related meanings. Thus, these meanings form a semantic network. However, it is crucial to note that not all usages are included within the semantic network.

To come up with the semantic networks, first, there must be a primary sense to begin with. Based on (Langacker, 1987), Tyler and Evans proposed the following criteria to consider a primary sense: (1) earliest established meaning, (2) the meaning which is predominate in the

semantic network, (3) use in composite forms, (4) relations to other spatial particles, and (5) grammatical predictions

When a semantic network is formed, there are the primary sense and other senses, which derive from the primary one. Since other senses are originated from the primary one, there must be some similarities or connections between the primary sense and these senses. As for spatial terms, there are the same or similar usages in expressing spatial relations. To express spatial relations, the terms *trajectory* (TR) and *landmark* (LM) are used in this study.

Spatial Relations and Meaning

When people use the concept of space to express objects that exist or are moving around us, people have spatial scenes in their minds. To describe objects or spatial relations in such scenes, many linguists come up with different terms for these objects.

Talmy (1975) introduced the terms Figure and Ground into cognitive linguistic. Figure is a moving or movable object while Ground is a reference point. For sentences like *the pen lay on the table*, *the pen* is considered as Figure while *the table* is considered as Ground.

Langacker (1987) proposed the terms *trajectory* (TR) and *landmark* (LM) to describe the relation of two objects. *Trajectory* (TR) is the object that moves or undergoes changes in relation to the other object, namely *landmark.*

Tyler and Evans (2003) applied the concept of trajectory and landmark in mentioning spatial relation. The trajectory (TR)-landmark (LM) configuration is used to refer to spatial relations. Apart from TR-LM, there is also the concept of containment. For example, when we wake up in a room, we are surrounded by walls, ceiling, and floor. This means we are

contained within a room. Such sentences like *I awoke in my bedroom* can express clear relations between physical TR and physical containers (LM). The terms and concepts of Tyler and Evans (2003) are used in many studies on English prepositions (Dallyono, 2019; Grozdanić, 2019; Aajami, 2019, 2022, among others), as well as other languages' spatial terms (Chmielewska, 2010; Bernardino, 2015; Bamshadi, Gholamalizadeh, & Tafakkori Rezayi, 2017; Đỗ, 2016; Saeed, 2018, among others).

This study adopted the approach of Tyler and Evans (2003); therefore, the terms trajectory (TR) and landmark (LM) are used in the discussion.

The Proto-Scene

When a semantic network is formed by using the Polysemy approach, there is a primary sense of that particular term. The proto-scene represents the primary sense in a semantic network. Other senses, which are in the semantic network, derive from this proto-scene.

Tyler and Evans (2003) define a proto-scene as an idealized mental representation of the recurring spatial scenes associated with a spatial term. The proto-scene is the combination of objects, which are seen as TRs and LMs, and a conceptual relation. For example, the proto-scene for spatial scenes of the following sentences:
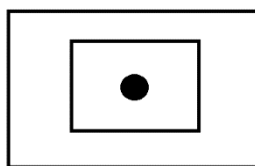
The cat is in the box.

The convict is in the cell.

These two sentences can be diagrammed as in figure 1.

Figure 1

Proto-Scene of in

In this study, the proto-scene of English, Chinese, and Thai spatial terms: *on*, *shang*, and *bon* is drawn out in the discussion part to show the relations of two objects, which are trajectory (TR) and landmark (LM).

Spatial Terms: *on*, *shang,* and *bon* Corpora

The corpora used in this study are the British National Corpus, the CCL corpus and the Thai National Corpus.

The British National Corpus or BNC was created by Oxford University Press in the 1980s to early 1990s. There are 100 million words of text from a variety of genres such as spoken language, fiction, magazines, newspapers, and academic works in the corpus. Texts compiled were selected from 1975 to 1993.

The CCL corpus was created by the Center for Chinese Linguistics or CCL of Peking University in 2003. The corpus consists of Chinese texts with 700 million Chinese characters. Texts from the corpus are also in a wide range of genres like literature, spoken, newspaper, academic, etc. Texts compiled were from the 11th century BC to 2003. CCL offers two corpora, which are Ancient Chinese and Modern Chinese. Modern Chinese texts are from 1949 onwards.

The Thai National Corpus was created by the Faculty of Arts, Chulalongkorn University in 2007. The corpus is designed to be comparable to the British National Corpus in terms of domain and medium proportions. TNC contains 33 million words. The corpus also offers a wide range of genres, for example, fiction, non-academic, academic, interviews, law, etc. 90% of the texts compiled are texts produced from 1998 to 2007. 10% are texts produced before 1998.

To figure out these three spatial terms and their usage, one thousand example sentences are randomly collected from the corpus in each language.

English sentences with *on* are collected from British National Corpus. The genres of spoken language, fiction, magazines, newspapers, and academic works were chosen. English sample sentences with such genres with a specified number of one thousand were randomly downloaded from the British National Corpus website. Sample sentences with *on* analyzed is *on* as a preposition (*on* X). Sample sentences with *on* of other usages, for example, phrasal verbs *go on*, *carry on* and others were excluded. Therefore, the focus is on words or phrases used together with *on*, which is X.

Chinese sentences with *shang* are collected from the Modern Chinese CCL corpus. The genres like literature, spoken, newspaper, and academic were chosen. The size of one thousand Modern Chinese sample sentences with such genres were randomly downloaded from the CCL corpus website. *Shang* as a location word (X *shang*) are analyzed. *Shang* as different word types such as verbs (*shang*+ noun) for example *shang shan* (go up on the mountain) *shang jie* (to go out) *shang sheng* (to rise) are not included in this study. Therefore, the focus is on words or phrases used together with *shang*, which is X.

Thai sentences with *bon* are collected from the Thai National Corpus. The genres of fiction, non-academic, academic, interviews, and law were selected. One thousand sentences within the selected genres were randomly downloaded from the Thai National Corpus website. *Bon* analyzed is *bon* as a preposition (*bon* X). Sentences with *bon* as a verb for example *kaebon* (to redeem a vow) *bonbansanklao* (to pray) are not included in this study. Therefore, the focus is on words or phrases used together with *bon*, which is X.

After sample sentences are collected from these corpora, words or phrases (X) that are used with these three spatial terms are analyzed to examine topics or meanings that these spatial terms can or cannot be used with. As for the topics and meaning, I refer to Zhang (1996)'s study of categorizing predicate meaning framework into 212 kinds of meanings. The categories consist of events, things, time and space, and components. However, some categories are too detailed for this study, for example, animals are divided into animals, beasts, birds, poultry, etc. For this study, no matter what kind of animals the usages of the three spatial terms are the same. Apart from this, there are some categories, which were not used because words or phrases used in sample sentences collected do not have those meanings, for example, the categories of sounds, reasons, laws, etc. Therefore, words or phrases used with these spatial terms are regrouped into 11 main categories, namely, position, events, living things, things, place, time, space, scope, direction, and abstract words.

Descriptions of these 11 categories are as follows:

1. Position in this study refers to a position of an object such as surface or top.

2. Living things are things that can breathe, eat, grow and reproduce such as humans, animals, and plants.

3. Things in this study refer to non-living things for example daily necessities, machines, furniture, materials, and other things.

4. Places are a particular position or point in space for example locations, lands, offices, and other places.

5. Events refer to something that happens or an occurrence such as occasions, trips or visits, and other events.

6. Date/day refers to a particular date or any of 7 days such as the 17th, Monday, etc.

7. Space refers to the dimensions of height, depth, and width within things that exist or move.

8. Direction refers to directions like north, south, east, west, right, left, and others.

9. Scope refers to extent of the area or subject matter which is relevant.

10. Aspect refers to a particular part or topics of something for example economics, health, etc.

11. Abstract refers to ideas or concepts, which do not have a physical existence for example success, belief, and other abstract ideas or concepts.

From these 11 categories, the results of meanings of words or phrases (X) that exist with the spatial terms on, shang, and bon are shown in table 2.

Table 2

Meaning of Words or Phrases (X) That Exist with the Spatial Terms on, shang and bon

Meaning of X	*on X*	*X shang*	*bon X*
position	ü	ü	ü
living things	ü	ü	ü
things	ü	ü	ü

Meaning of X	*on X*	*X shang*	*bon X*
places	ü	ü	ü
events	ü	r	r
date/day	ü	r	r
space	r	ü	ü
direction	ü	r	r
scope	r	ü	r
aspect	ü	ü	r
abstract	ü	ü	ü

Note. ü means the spatial term exists with words that contain this meaning

   r means the spatial term does not exist with words that contain this meaning

From table 2, we can see that there are some categories of X that all three words are used with. The categories are position, living things, things, and places. These ways of using refer to the position of two objects, which is the basic meaning of these three spatial terms.

From the 11 categories listed in table 2, the existence of the meanings with the spatial terms on, shang and bon in each category are as follows:

1. Position

Position from table 2 refers to a spot, surface, or on top of something. This corresponds with the basic meaning of these three spatial terms described in the dictionaries, which is also listed as the first item in table 1. The sample sentences collected from the corpora, *on the surface of* or *on top of* can be seen in these three languages.

2. Living things

All three spatial terms can be used with living things to refer to the position on human bodies like *on shoulder*, *on one's skin*; animal bodies like *on horseback*, *on the head of the tiger*; parts of plants like *on the tree*, *on the tree branch*.

3. Things

All three spatial terms can be used with things to refer to the spatial relation of objects. In fact, there are many subcategories of things such as 1. natural things like islands, beaches, mountains, etc.; 2. things that are built by humans like bridges, roads, streets, etc.; 3. architectures like monuments, buildings, halls, etc.; 4. devices like machines, computers, screens, etc.; 5. things used on daily life like paper, map, plate, etc.; 6. furniture like bed, sofa, chair, etc.; 7. clothes and accessories or ornament like shirt, dress, necklace, etc.; 8. things used for entertainment like piano, CD, films, etc.; 9. materials like plank wood, glass, stone, etc.; 10. vehicles like planes, boats, buses, etc.

4. Places

Places like land can be used with all three spatial terms. However, there are some words or phrases about places that use different spatial terms in other languages. For example, *on the ground floor* or *on different floors* can be used in English but in Chinese, *shang* cannot be used in these cases; the term *zai* (to be at) is used. In the Thai language, *bon* can be used to refer to a particular floor like *on the second floor* but in case of *on different floors*, *bon* cannot be used.

5. Events

On can be used to refer to the event immediately after something like *on arrival*, *on our return*, *on release*. *Shang* and *bon* cannot be used to refer to the event that takes place.

6. Date / Day

When referring to time like date and day, *on* is always used together with the date and day like *on Sunday*, *on October 9*. While *shang* and *bon* are never used with date and day. As for the date, in Chinese the date is just mentioned as a time word or in some cases, a particular date may be used with the preposition *yu*. In Thai the date can be mentioned without prepositions, in some cases, the preposition *nai* (in) is used. When referring to days in Chinese and Thai, days are normally mentioned without prepositions. This point is the main difference between English *on* and the other two languages' spatial terms.

7. *Space*

From sample sentences collected, the term of space like sky can be used with *shang* and *bon* but we did not find the term *on* used with the word *sky,* moreover, in English, the term *in* is normally used with the sky. Even though in the Thai language the spatial term *nai* (in) can also be used with the word *thongfa* (sky), the usage of *nai* will not be discussed in this study since the word *thongfa* (sky) can also be used with *bon*.

8. *Directions*

Directions like the eastern side, the south side, right, etc. can be used with *on* to show the position of two objects. However, from sample sentences collected we do not find *shang* and *bon* used with directions. Normally, to express directions in Chinese and Thai, a verb is needed, *zai* in Chinese and *yu* in Thai. The verbs are put before words that express directions. For instance, to express to be on the right, in Chinese is *zai youbian* and in Thai is *yu thangkhwamue*.

9. Scope

Shang can refer to scope or area like *ban shang* (in class) *huiyi shang* (in the meeting) *shehui shang* (in society). *On* does not have this meaning (Rundell, 2002; Cobuild. 2006; Hornby,2010; Mayor, 2012). *Bon* does not express scope or area (Royal Institute, 2011; Bandhumedha, 2016).

10. Aspect

On and *shang* can refer to some aspect like economics, health, etc. even the word *aspect* itself can be used with these two terms while *bon* cannot.

11. Abstract

All three spatial terms *on*, *shang* and *bon* can be used with words or phrases with abstract meaning. For instance, words like belief, assumption, basis, etc. in three languages are used with all three spatial terms to form phrases like *on the belief (of)*, *on the assumption (of)*, *on the basis (of)*, *xinnian shang* (on the belief of), *jieshe shang* (on the assumption), *(zai)......jichu shang* (on the basis of) *bon khwamchuea* (on the belief of), *bon phuenthan* (on the basis of) and *bon sommutithan* (on the assumption).

Even though words or phrases with abstract meanings can be used with three spatial terms, there are some differences which are caused by differences between languages. For example, the word *need*, can be used with *on* and *shang* as in *on the need and xuqiu shang* (on the need). However, to way express this phrase in Thai is *tam khwamtongkan* (on the need) the word *khwamtongkan* (need) is normally used with the preposition *tam* (according to).

Discussion

The objective of this study is to find out similarities and differences between English, Chinese, and Thai Spatial terms: *on*, *shang*, and *bon* from a cognitive perspective. Sample sentences from BNC, CCL, and TNC corpora gave us a view of the meanings and usages of the three spatial terms: *on*, *shang* and *bon*. From the data analysis, the result shows that these three spatial terms are polysemy words in which there is a basic meaning or the primary sense. Additionally, there are extended meanings or other senses, which derive from the primary sense.

To form a semantic network, there must be a primary sense to start with first. The proto-scene represents the primary sense in a semantic network. Other senses, which are in the semantic network derive from this proto-scene. When there is a primary sense or proto-scene together with other senses, which are originated from the proto-scene, a semantic network can be formed.

The Proto-Scene

From the data analysis, I claim that the basic meaning or the primary sense of these three spatial terms are the same. The primary sense of *on*, *shang,* and *bon* is the spatial relation of object or trajectory (TR) on the surface of something or landmark (LM). Therefore, the proto-scene of these three spatial terms can be drawn as the one in figure 2.

Figure 2

Proto-Scene for Spatial Scenes of on, shang and bon.
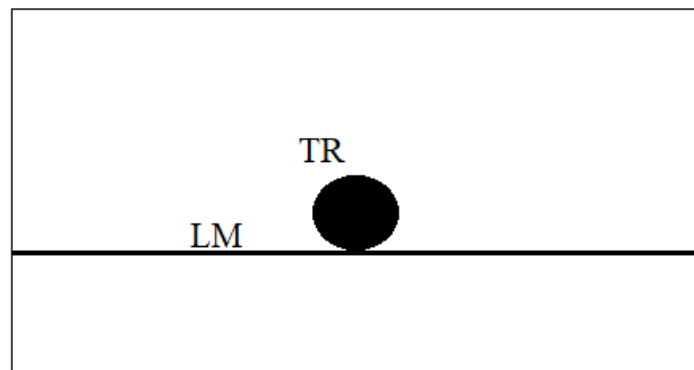
The proto-scene of these three spatial terms is used to describe the spatial scene, which is the physical-spatial relations of physical TR and physical LM.

For instance, *I sit on a bench*, which is collected from BNC. *I* in this sentence is considered as TR and *a bench* is considered as LM.

As for *shang*, there is the same kind of proto-scene. Sentences like *Gongju ying shi xian zhiyu nenggou fangbian na dao de weizhi shang.* (Tools should be placed on the location/position that is convenient to pick.) *gongju* (tools) is TR, which is to be placed on *weizhi* (location or position), which is LM.

Similar to English and Chinese, there is also this kind of proto-scene from data collected in the Thai language. For instance, *kancharachon bon thanon* (traffic on the road) *kancharachon* (traffic) is considered as TR, and *thanon* (the road) is LM. The spatial scene is many vehicles on the road.

From the 11 categories of words or phrases (X) in table 2, the result shows that the first four categories, namely position, living things, things, and places are used with all three spatial terms. The reason is that these words refer to physical-spatial relations. Position can be seen in the case of proto-scene. Living things, things, places are all physical LMs of those sentences.

The abovementioned examples and the analysis of three spatial terms show that the primary senses of *on, shang,* and *bon* are the same, which is a position or to exist on the surface. Consequently, they share the same proto-scene for spatial scenes, which is shown in figure 2 as objects (TR) on the surface of something (LM).

The Extended Usage from Physical-Spatial Relation to Non-physical Relation

From the proto-scene, which is physical-spatial relation as shown in figure 2, the usage can be extended to non-physical relation.

For *on,* from expressing physical-spatial relations as in *I sit on a bench,* the usage can be extended to non-physical relations such as *getting on top of the workplace.* This kind of usage derives from the physical position of LM like *a bench.* In this example, *the workplace* is considered as non-physical because it does not refer to the highest place in the office building physically but refers to the highest position in terms of ranking in the workplace.

As for *shang*, there are sentences that express physical-spatial relations like *Gongju ying shi xian zhiyu nenggou fangbian na dao de weizhi shang.* (Tools should be placed on the location/position that is convenient to pick.) The usage of the word *weizhi* (location or position) can be extended to a non-physical one. For example, *ba zhiyu fang zai di yi zhongyao*

de weizhi shang. (Put intellectual education on the most important position.) This sentence means consider intellectual education as the most important thing. Both *intellectual education*, which is TR, and *position*, which is LM in this sentence are invisible. Even though the same word, namely *weizhi* (position) is used in front of *shang*, the positions mentioned in these two sentences are different since one is physical while the other is not.

From the physical-spatial relation of *bon* like *kancharachon bon thanon* (traffic on the road), the road or LM can be extended to the non-physical usage. For example, *kwam samret bon thanon naktennis achip* (success on the road of professional tennis player) *kwam samret* (success) is TR and *thanon naktennis achip* (road of professional tennis player) is LM. *Thanon* (road) is this sentence is not a real physical road but a metaphor of the route of being professional tennis player, which starts from the beginning to the success.

The abovementioned examples come from the last category of words or phrases (X) in table 2, namely abstract words or phrases. Even though all three spatial terms *on*, *shang,* and *bon* can be used with abstract words, there could be some differences in the words used. A particular word may be used in one language, but not in others. This depends on how the meaning is perceived in that language; spatial terms rather than *on*, *shang,* or *bon* may be used instead when referring to the same topic.

Non-physical usages of three spatial terms *on*, *shang,* and *bon* are extended usage of physical-spatial relation. Abstract words or phrases, which are LMs are non-physical usages. This kind of usage arises from the concept of the support that LM gives to TR, in which without LM, TR may not be in that position as drawn in figure 3.

Figure 3

Support Sense
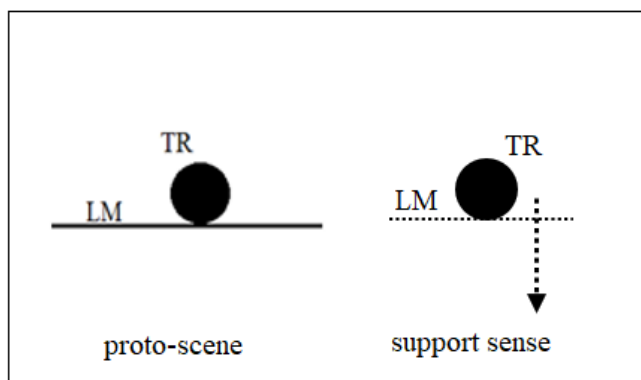
From the analysis, the result shows that this non-physical usage comes from the proto-scene and is considered as one sense or meaning in the semantic networks of *on*, *shang,* and *bon.* The sense is called the support sense in the semantic networks.

Differences in Extended Usages

From categories in table 2, there are still cases in which these three spatial terms *on*, *shang,* and *bon* are different like in the case of expressing events, date or day, space, direction, scope, and aspect.

To refer to these meanings or senses, the following terms, which are temporal sense, high position, direction, covering, and linkage are used to show different spatial scenes of TR and LM.

Temporal sense refers to time perception or concept. Events, dates, and days are the concepts of time. In a temporal sense, the timeline is LM, and the event, date, or day that some action takes place is TR.

High position refers to the position of something in a place higher than the other thing, which is not attached to the surface. The position in space is LM and the existence or movement of the object is TR.

Direction refers to the concept of expressing directions. The direction is LM while the object in the scene is TR.

The sense of covering is applied as in TR covers LM. TR is on LM as in objects that are in the particular scope or area.

As for linkage sense, the aspect or topic is LM and the other objects mentioned are TR. This sense comes from the concept of linkage. Linkage refers to the sense of objects (TR) being connected to LM when TR is on the LM.

From the last 7 categories in table 2 and the abovementioned senses or extended usages of these three spatial terms, the result of whether any of these terms can be used or not is summarized in table 3.

Table 3

Extended Usage of the Spatial Terms on, shang and bon

Senses	*on*	*shang*	*bon*
temporal sense	ü	r	r
high position	r	ü	ü
direction	ü	r	r
covering	r	ü	r
linkage	ü	ü	r

Note. ü means the spatial term can be used to express this sense or meaning

r means the spatial term cannot be used to express this sense or meaning

From the data analysis, extended usages of the spatial terms *on, shang* and *bon* in each sense are as follows:

Temporal Sense

When using *on* to express events, the concept of time is unavoidable since the scene refers to the point of time after the occurrence of that event, which means immediately after something, for example, *on arrival*, *on our return*. In addition to events, date and day are definitely the concepts of time. English prepositions can be used in the temporal sense, such as on Monday, on January 1st, etc. Since there is the word *timeline*, that means humans conceptualize time as a line. Therefore, we see the timeline as LM, and the event, date, or day that some action takes place will be TR as shown in figure 4.

Figure 4
Temporal Sense
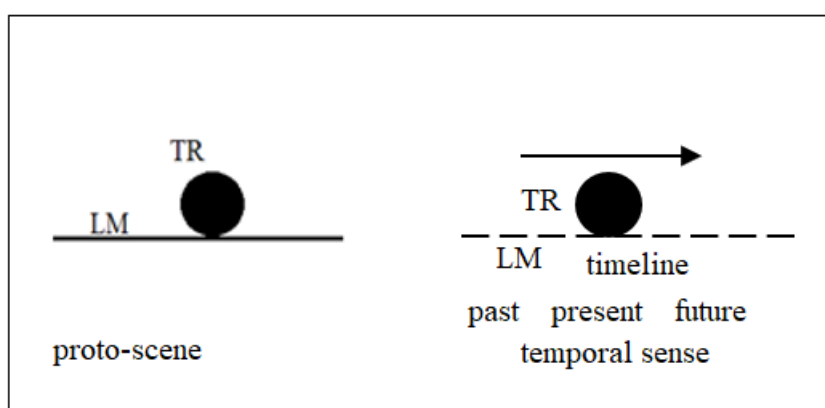
Only *on* has temporal sense, *shang* and *bon* cannot express this particular sense. In Chinese, *shang* is considered as a location word. Chinese location words have no usage in expressing time. There are other ways to express the concept of time in Chinese, which will not be discussed in this study. As for Thai, the preposition that can be used with day or date is *nai* (in), not *bon*.

High Position

When mentioning something in space like *the sky*, *shang* and *bon* can be used since they can refer to the position of something, which is higher than the other thing. These two things may or may not be attached. However, when using *on* to express the relation of two objects, the objects are attached.

In the case of space that *shang* and *bon* are used, space is LM and the existence or movement of the object is TR. TR is in the higher position, which derives from the proto-scene. TR is on LM as shown in figure 5.

Figure 5

High Position Sense
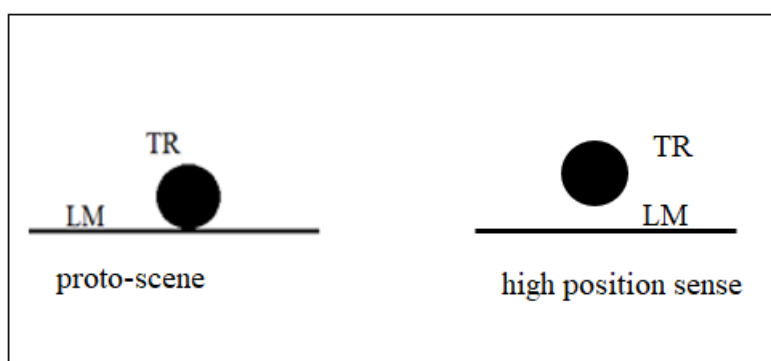
Direction

The spatial term *on* can express directions like right side or south side. Directions that are used with *on* is LM while the other object in the sentence is TR as shown in figure 6.

Figure 6

Direction Sense
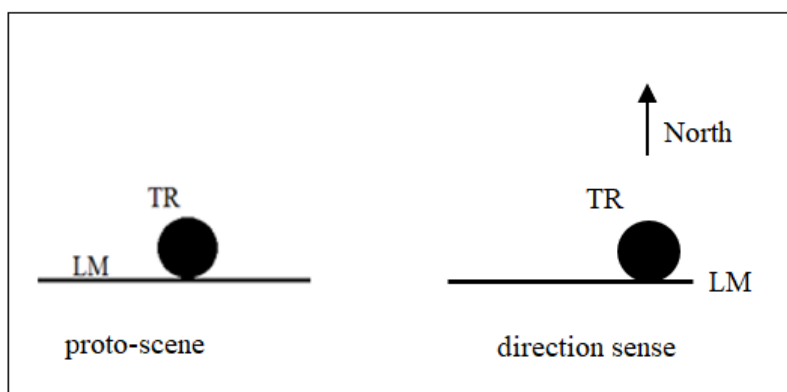
Shang and *bon* cannot express direction. To express directions in Chinese and Thai, a verb, *zai* in Chinese, and *yu* in Thai are needed and then followed by direction words.

Covering

The spatial term *shang* can express scope or area like when referring to students in a class *ban shang de xuesheng* (students in the class). The scope or area like *ban* (class) is LM and the noun after the term *shang* like *xuesheng* (students) is TR. The sense of covering is applied as in LM covers TR. The TR mentioned is the TR that is on LM as in objects that are in the particular scope or area. The scene of covering sense is shown in figure 7.

Figure 7

Covering Sense
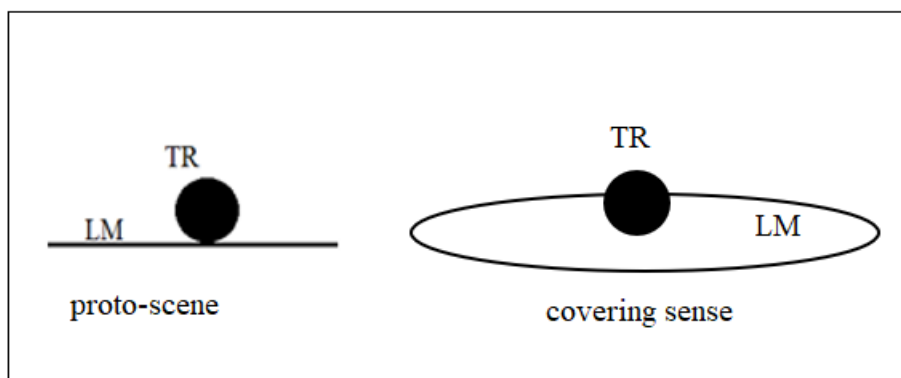
To express scope or area in English and Thai, *on* and *bon* are not used while *in* and *nai* (in) are used.

Linkage

Spatial terms *on* and *shang* can be used with nouns indicating aspects or topics. The aspect or topic is LM and the other object mentioned is TR. This sense comes from the concept of linkage. Linkage refers to the sense of objects (TR) being connected to LM when TR is on the LM. The scene of linkage sense is shown in figure 8.

Figure 8
Linkage Sense
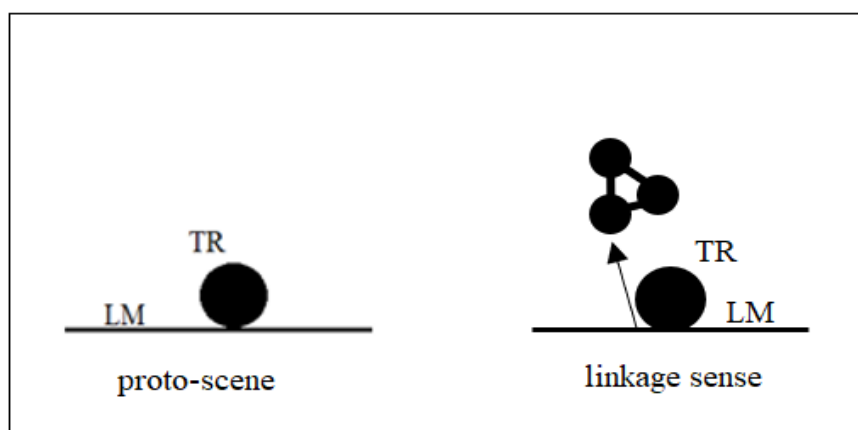
In Thai language, to express aspects or topics, the preposition *nai* (in) is used, not *bon* because the concept of a topic or aspect for Thai people is conceptualized as containment. When Thai people refer to a topic or aspect, the spatial scene is in the containment.

From the discussion of *on*, *shang*, and *bon* usages, we can see that these three terms are polysemy words. The primary sense and the support sense of these three words are the same. However, other senses are different as shown in table 3. Therefore, the semantic networks of these three spatial terms are different.

Semantic Network of on, shang and bon

The semantic network of *on* is shown as the network in figure 9. The proto-scene is the primary sense, which is the spatial relation of the object (TR) on the surface of something (LM). From this proto-scene derive other senses, which are support, temporal, direction, and linkage.
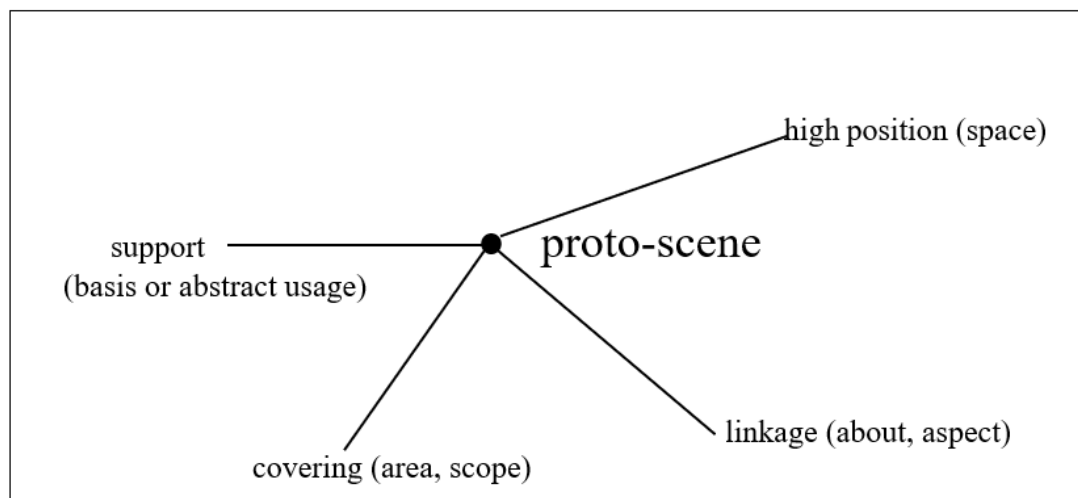
Figure 9

The Semantic Network of on
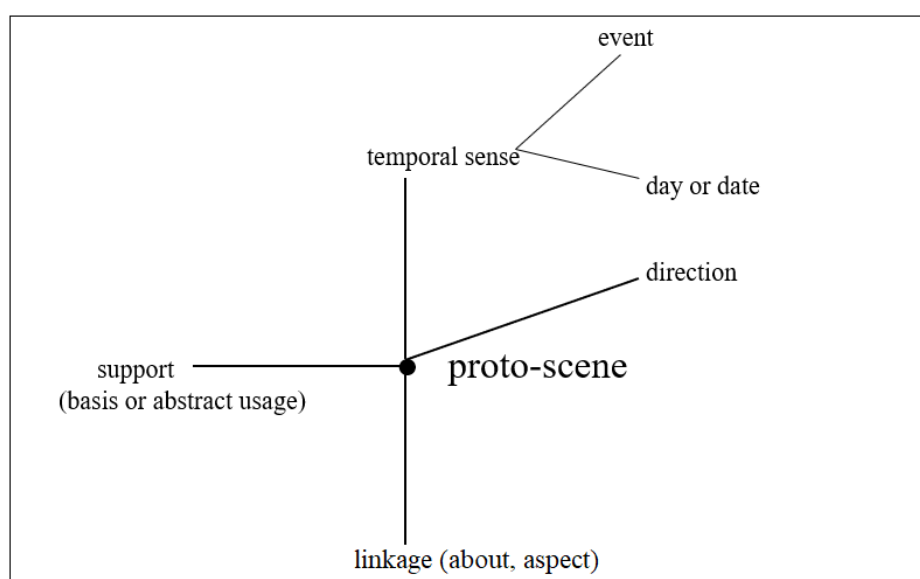
The semantic network of *shang* is shown as the network in figure 10. The proto-scene is the primary sense, which is the spatial relation of the object (TR) on the surface of something (LM). Other senses, which are support, high position, covering, and linkage are extended from the proto-scene.
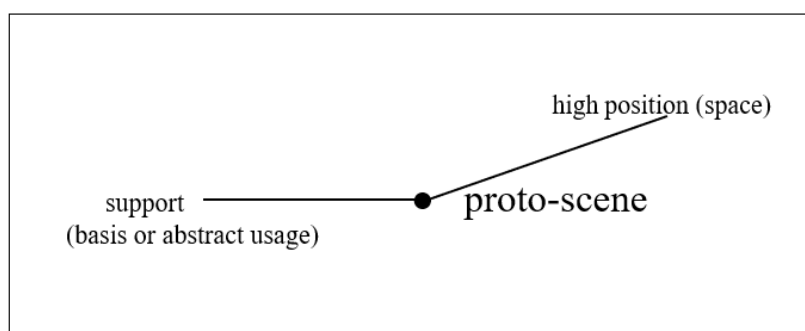
Figure 10

The Semantic Network of shang

The semantic network of *bon* is shown as the network in figure 11. The proto-scene is the primary sense, which is the spatial relation of the object (TR) on the surface of something (LM). The meaning of high position in space and the extended usage of abstract concepts come from the proto-scene.

Figure 11

The Semantic Network of bon

With clear illustrations in figure 9, figure 10, and figure 11, the semantic networks of these three spatial terms are shown. All senses that exist in the semantic networks of *on, shang, and bon* can be summarized in table 4.

Table 4

Senses from Three Semantic Networks of the Spatial Terms on, shang and bon

Senses	*on*	*shang*	*bon*
primary (proto-scene)	ü	ü	ü
support	ü	ü	ü
temporal sense	ü	r	r
high position	r	ü	ü
direction	ü	r	r
covering	r	ü	r
linkage	ü	ü	r

Note. ü means there is this particular sense in the semantic network

r means there is no such sense in the semantic network

From table 4, we can see that the similarities of these three spatial terms are the primary sense or basic meaning, which is the physical-spatial relations of the object (TR) on the surface of something (LM). The other similarity of all three spatial terms is the support sense. This sense is the non-physical-spatial relation or the abstract usage, which derives from the physical-spatial relation.

As for other senses, they exist in either one or two semantic networks as shown in table 4. Temporal sense only exists in the semantic network of *on*. Both *shang* and *bon* have high position sense in the semantic networks. Only *on* can express direction. Thus, this sense only exists in the semantic network of *on*. Covering sense exists in only the semantic network of *shang*. Lastly, linkage sense exists in both semantic networks of *on* and *shang*.

Therefore, we can see that differences between these three spatial terms are obvious. Such differences should be emphasized in foreign language teaching and learning.

For English teaching and learning of the spatial term *on*, table 4 can be introduced or taken into consideration in teaching the preposition *on.* Firstly, teachers can start by explaining the similarities of *on* and *shang or bon*, when they refer to the basic meaning as shown in figure 2. Teachers can give an example of *a cup on the table.* Then, teachers can explain the extended usage of abstract words or phrases, which derive from the basic meaning, for example *on the basis.* After explaining the terms' similarities, teachers should compare the differences between these spatial terms. Figure 4 can be used to let students understand that *on* is used in expressing temporal sense like *on arrival*, *on our return*, *on release, on May 7, on Monday*, while figure 6 can be used to express directions like *on the southside, on your left.* As for Thai learners, the linkage sense or usage of expressing aspects or topics should be emphasized since *bon* does not have this sense.

For Chinese teaching and learning of spatial term *shang*, table 4 can also be used in teaching the location word *shang.* In teaching the term, teachers can start by explaining the similarities of these terms first. Figure 2 can be used to let students see the basic meaning. An example like *zhuozi shang* ...... (something on the table) can be given. Then, teachers can explain the extended usage of abstract words or phrases with an example like *(zai)......jichu shang* (on the basis of). After that, teachers should emphasize the differences between these terms. Figure 7 can help in teaching *shang* with the meaning of area or scope like *ban shang* (in class), *shehui shang* (in society). This meaning should be emphasized since the other two terms cannot express it. As for Thai learners, the linkage sense also needs to be emphasized since *bon* does not have this sense.

Conclusion

This article compared spatial terms in English, Chinese, and Thai, which are *on*, *shang*, and *bon* respectively by adopting cognitive approaches. One thousand English sentences with the preposition *on* were collected from British National Corpus by Oxford University. One thousand Chinese sentences with the location word *shang* were collected from Modern Chinse CCL Corpus by Peking University (2021). One thousand Thai sentences with the preposition *bon* were collected from the Thai National Corpus by Chulalongkorn University. Sample sentences were analyzed with the focus on words or phrases used with these three spatial terms. There are 11 categories of the meanings of these words or phrases. The results of the data analysis were discussed by using spatial relations and meaning, proto-scene, polysemy words, and the semantic network of these three spatial terms. The conclusions are that these three terms are polysemy words; the proto-scene or primary sense of these three words are the same, in which TR is on the surface of LM. With this proto-scene, the usages can be extended to other senses as shown in the semantic network of each term. The spatial term *on* can be extended to such senses as support, temporal, direction, and linkage, while *shang* can be extended to support, high position, covering, and linkage senses. Bon usage is relatively limited with only two extended usage high positions in space and abstract usage. Differences in these three spatial terms are to be emphasized in the teaching and learning of these three languages' spatial terms.

The limitation of the study is that this study only focuses on these three terms as spatial terms. This study only included *on* as a preposition; *shang* as a location word, which is considered as a noun in Chinese, and *bon* as a preposition. Future studies should explore these

three terms in other usages or meanings. In addition, other spatial terms with similar concepts can also be included. In terms of the approaches adopted, a polysemy approach suggests that the meanings of a spatial particle are related in some way. Along with this, the semantic network is a network of related meanings. Thus, meanings which are unrelated may be excluded from the semantic network. Apart from this, despite the fact that space is a basic and universal concept, some individual may see things and their relations differently. Studies of these spatial terms from other perspectives or approaches should also be conducted to have a clearer view and better understanding of these three terms' similarities and differences.

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