

Implicit Cognitive Meanings of the Spatial Prepositions in, on, and at in English

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Abstract

Learning English prepositions is deemed as a difficult task for EFL learners (Cheng, 2006) because some English prepositions have many similar but slightly different meanings (Boers & Demecheleer, 1998; Radden, 1985). EFL learners face difficulty in using English prepositions because they may only learn the linguistic forms but not the conceptual meanings embedded in prepositions. The purpose of this research is to investigate English spatial prepositions in, on, and at from a cognitive perspective, e.g. the theory of conceptual metaphor (Lakoff & Johnson, 1980) and cognitive grammar (Langacker, 2008). The investigation of the present study was mainly done with document analysis (Bowen, 2009; O'Leary, 2014). After reviewing many primary and previous studies (Dikken, 1995; Freeborn, 1987; Lindstromberg, 1996, 2010; Nishimura, 2005; Radden, 1985), the findings show that English prepositions in, on, and at have not only their prototypical meanings but also implicit meanings, which may be extended by metaphors. It is also found that there is an intimate relationship between the spatial and temporal meanings of prepositions. Besides, the prototypical meanings of in, on, and at can be the foundation to learn other spatial or temporal concepts. Therefore, it is suggested that understanding metaphors and the implicit meanings embedded in prepositions can help EFL students' learning of English language.

1. INTRODUCTION

Learning English prepositions is a difficult task for learners who speak other languages, e.g. Mandarin Chinese, as their native language (Cheng, 2006). Boers and Demecheleer (1998) point out that English has many prepositions, such as in/into, on/onto, and under/below, which are similar but slightly different. It might be a reason why second language learners and EFL learners have problems on selecting correct prepositions in their everyday communication. In Taiwan, where English is a foreign language, English learners frequently make mistakes with prepositions in, on, and at (Cheng, 2006) because the single Mandarin character 在/zai can be employed to present the identical concepts of the three prepositions (Ross & Ma, 2006). In addition, the structure of a prepositional phrase (PP) in English is different from that in Mandarin Chinese. While a PP is a preposition with a noun phrase combination in English, a Mandarin PP is formed by the linear order of a preposition, a noun phrase and a postposition. For instance, in the Mandarin PP 在桌子上/zai zhouzi shang/on the table, the character 在/zai refers to the preposition, 桌子/zhouzi/table is the

noun phrase, and 上/shang/up functions as the postposition indicating the actual relationship between the trajectory and the landmark. Hence, the structure of PP in Mandarin Chinese is suggested as a circumposition (Liu, 2002) reflecting the same concept with English spatial PP. However, English prepositions in, on, and at seem to express more meanings than their counterparts in Mandarin Chinese because Mandarin native speakers frequently use English prepositions wrongly (Cheng, 2006). It seems that Mandarin native speakers cannot rely on their prior knowledge regarding to space and time to learn English prepositions. In other words, if the Chinese character 在/zai can completely show the identical meanings of English in, on, and at, Taiwanese English learners should have less problems on using them.

Nevertheless, Mandarin native speakers absolutely make many mistakes on using English prepositions because the conceptualisation of space formed with their mother tongue is not 100% in accordance with English native speakers' embodiments (Kövecses, 2002; Lakoff & Johnson, 1980). Linguistic relatively (Whorf, 1956) highlights that people's thought may be influenced by their language. In other words, how people understand the concept of space can be shaped by their uses of language. Thus, the uses of English prepositions are supposed to reflect native English speakers' conceptualisation of space. If EFL learners have different understanding of space, language interference (Jarvis & Pavlenko, 2008; T. Odlin, 1989; Terence Odlin, 2003) may occur when learning English language. Furthermore, the three prepositions in, on, and at are considered the difficult fundamental function words in English (Celce-Murcia & Larsen-Freeman, 1999; Chen, 1990; M. C. Jiang, 1995; Posner, 1989). Each of them have its prototypical meaning as well as extended meanings. Second or foreign language learners might not be familiar with the implicit or conceptual meanings of these prepositions because they do not grow up in an English-speaking environment. That is to say, EFL learners may keep using English prepositions wrongly because of their varied conceptualisations about space and time. When their prior knowledge, which is constructed under their mother tongues, differs from English, language interference may cause learning difficulty and linguistic errors.

Accordingly, the present study aims to investigate the spatial meanings of English in, on, and at from a cognitive perspective. What are the conceptual meanings expressed by spatial in, on, and at in English? In other words, when English in, on, and at refer to space, what are their prototypical and extended meanings? Taiwanese EFL students have already studied English since they are at primary school but they still cannot avoid making mistakes with the use of prepositions. Wang (2016) points out that Taiwanese English education majorly focuses on teaching the linguistic forms of the language. Therefore, the present study assumes that only learning the linguistic forms or the collocations of English PPs is not sufficient for correctly using English prepositions. There should be more concepts embedded in English prepositions and they are not taught in the English courses in Taiwan. Hence, the research question of the present study is that other than the prototypical meanings, what implicit meanings are expressed by the English prepositions in, on, and at. Furthermore, as metaphor not only can provide people the way of thinking but also extend word meanings (Boers & Demecheleer, 1998; Lindstromberg, 1996, 2010), this research examines in, on, and at with Lakoff and Johnson's (1980) theory of conceptual metaphor and Langacker's (2008) Cognitive Grammar.

2. LITERATURE REVIEW

Cognitive Grammar and Conceptual Metaphor

Langacker's (2008) Cognitive Grammar discusses many concepts about the relationship between people's thought and language. Word meanings are derived from people's interaction with the world. Different people experience the world differently so they may have varied understanding about the world. An individual and the world are connected with each other by image schemas, which are described as "schematised patterns of activity

abstracted from everyday bodily experiences, especially pertaining to vision, space, motion, and force" (Langacker, 2008, p. 32). People might have different viewpoints on the same concept so they might have varied ways to describe a specific concept. For example, there is a book on the table can also be described as there is a table under the book. The two sentences certainly depict the same relationship between the table and the book. Nevertheless, because the focuses are reversed, diverse expressions can be created to describe the situation. Moreover, the alternative process of experiencing and describing the same content is defined as construal (Dirven & Verspoor, 2004; Langacker, 2008, pp. 55-89). Langacker (2008) employs 'trajectory' and 'landmark' to specify the primary focus and the secondary focus in linguistic expressions. In there is a book on the table, the trajectory is the book and the landmark is the table. By contrast, the trajectory is the table and the landmark is the book in there is a table under the book. These reversed descriptions of the same situation are called construal. Additionally, people's reference point also influences their understanding of the world. For example, the concept of time can be understood both vertically, e.g. 下個月/xia ke yue/next month, in which 下/xia means "down", and horizontally, such as 聖誕節比新年早到/sheng dan jie bi xin nian zao dao/Christmas comes before New Year, in Mandarin Chinese. However, time can only be understood horizontally in English (Evans, 2004; Radden, 1985).

Metaphor not only can extend word meanings but also influence people's understanding of space. By definition, "metaphor is a cross-domain mapping in the conceptual system" (Lakoff, 2006, p. 15). It pervades people's everyday expressions and provides people a way to think of one thing in terms of another (Lakoff & Johnson, 1980). For example, people usually employ the concept of space to understand the concept of time because time is a relatively abstract idea so people try to find a more familiar and concrete concept, which is space, to understand it. Consequently, the metaphor TIME IS SPACE is formed in people's mind and this metaphor creates many linguistic expressions, e.g. in the room vs. in summer, at the station vs. at noon, and on the table vs. on Monday. Lakoff and Johnson (1980) argue that people's conceptual system is metaphorical, which means people can understand concepts by metaphoricalised them in diverse ways. English speakers utter in summer as the summer is thought as a three dimensional space so the preposition in can be applied. They say at noon because noon similarly expresses a specific temporal point. They speak on Monday because a day may be transferred into a 2 dimensional spatial surface. In addition to TIME IS SPACE metaphor, many other metaphors can be accessed in people's everyday communication, such as TIME IS MONEY, ARGUMENT IS WAR, LOVE IS A JOURNEY, and MORE IS UP. Interestingly, a certain notion can be understood through several different concepts. For example, depending on the speaker's intention, TIME can be comprehended as SPACE, MONEY, and an ARROW to show different aspects of TIME. Thus, people can find various metaphors in their everyday communication, such as don't waste my time and time flies. The former presents TIME IS MONEY metaphor and the latter indicates TIME IS A FLYING OBJECT metaphor (Lakoff, 2006; Lakoff & Johnson, 1980).

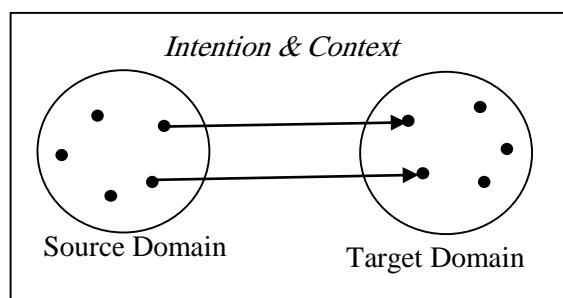


Figure 1. Conceptual mapping

Mapping and projection are the key concepts in metaphor research (Kövecses, 2002; Lakoff, 2006; Lakoff & Johnson, 1980). Mapping is a process of projection from a source concept domain to a target concept domain and it is how conceptual metaphor operates when people are thinking and speaking. As mentioned, people are inclined to think an unfamiliar concept via another relatively familiar concept. The source domain concept is the relatively more familiar one, which functions to be the prior knowledge to understand the target notion. Besides, mapping is a one-way projection. Figure 1 demonstrates the process of mapping. Each circle presents different concept domains including several attributes, which are shown as the black dots, insides. The arrows refer to the feature projection from the source domain to the target. Importantly, not all the attributes might be projected because language speakers only borrow the attributes to present some particular aspects of the target. Hence, the language users' intention and the context when an individual is thinking and speaking dominate the mapping process (Wang, 2008). People's intention and the context might be the reasons to explain why different source concepts are employed to understand the same target. For example, when a person wants to show the speed of passing time, the person might metaphoricalise time as a flying arrow. When one intends to emphasise the value of time, the one might employ some linguistic expressions about money to describe time.

Moreover, metonymy cannot be overlooked when discussing metaphor. Unlike metaphor, which is a cross-domain mapping and its purpose is to achieve understanding, metonymy is a mapping process within a single concept domain and it has referential function (Lakoff & Johnson, 1980). When a language user employs one thing to stand for another in his linguistic expression, the individual is using metonymy. One of the most salient examples of metonymy is PART FOR THE WHOLE. For instance, the phrase 'good heads' in we need some good heads in our team refers to we need some 'talent people'. In this case, the body-part 'head' is employed to stand for a whole person. The mapping process is within the same conceptual domain since head and body are certainly different human body-parts. Interestingly, metonymy could provide additional meanings. For instance, 'good heads' in we need some good heads in our team stands for persons who are smart. This noun phrase can be replaced by good hands, which means people who are skilful and new blood referring to new members. Each of them presents some special features of the referred person.

In cognitive science, an individual's personal experience is highlighted as it is further turned into the individual's prior knowledge or embodiment influencing the individual's thinking, speaking, and understanding of the world (Kövecses, 2002; Lakoff & Johnson, 1980; Langacker, 2008; Yule, 2006). Mapping is also based on the language user's prior knowledge. Therefore, how metaphor influences people's thought is certainly decided by their experience. For instance, Mandarin speakers' conceptualisation of time can be both vertical and horizontal but English speakers can only understand the timeline horizontally (Boroditsky, 2001; Evans, 2004; Kemmerer, 2005). In other words, some metaphors can be universal and some can be specific. Some uses of prepositions may be linguistic specific, which is needed to be learnt by EFL learners if they do not have the same conceptualisation.

English Prepositions

For Pullum and Huddleston (2002, p. 603), a preposition is defined as "a relative closed grammatical distinct class of words whose most central members characteristically express spatial relations or serve to mark various syntactic functions and semantic roles." A preposition describes the relationship between a trajectory and landmark (Langacker, 2008, pp. 70-73). Figure 2 presents the syntactical structure of the prepositional phrase, on the table, which is composed of a preposition and a noun phrase (NP) (Crystal, 1992). For Li and Cheng (1988) a prepositional phrase is formed by a preposition and its object and a PP function to refer to place, time, direction, manner of an action, etc.

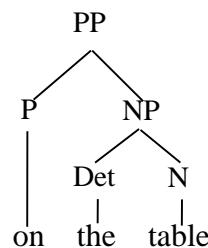


Figure 2 .The tree diagram of the prepositional phrase, on the table

A PP can play both the roles of adjective and adverb in English and an individual's embodied experience assists the one to construct the knowledge of space. For Lindstromberg (2010), a PP can function as (1) preposition proper; (2) directional adverbs; and (3) particles in English sentences. Preposition proper generally refers to the prototypical meaning of a preposition presenting the concept of place or time in a sentence, e.g. at school and on the table. The concept of directional adverb is presented as in the phrase, go away. This kind of preposition is also known as an intransitive preposition because no NP is allowed to follow the preposition (Lindstromberg, 2010). 'Away' definitely shows a direction of 'leaving the speaker'. Finally, a preposition can combine with an intransitive verb and forms a phrasal verb in English. For instance, the preposition up in pick up functions as a particle and additionally entails the sense of an upward motion. A particle is defined as "uninflected grammatical function words and used for not to distinguish between prepositions and adverbs" (Cheng, 2006, p. 7). For EFL learners, e.g. Taiwanese students, the verb-particle combination is mostly treated as an idiomatic expression. Instructors usually tell students to memorise each phrasal verb as phrasal verbs are diverse chunks. By learning English prepositions in this way, learners can hardly acquire the covert conceptual meanings embedded by the prepositions (Wang, 2016) and they may still make mistakes on using English prepositions. Thus, the present study aims to investigate the conceptual meanings of English prepositions in, on, and at in order to provide EFL learners more detailed information about them. By learning English prepositions, it should not only learn prototypical meanings but also the extended meanings, which may not exist in EFL learners' mother tongues.

3. METHODOLOGY

In order to address the research question, which is what are the conceptual meanings expressed by spatial in, on, and at in English, the conceptual meanings of English in, on, and at were reviewed and analysed via document analysis. Document analysis is a type of qualitative analysis, which systematically examined collected data based on a specific topic (Bowen, 2009; O'Leary, 2014). The research process includes reading, organising, description, classifying and interpretation. The target and major documents for analysing in the present study were Lindstromberg's (2010) English Prepositions Explained and Nishimura's (2005) Prepositions because their discussion on English prepositions provides many detailed views from a cognitive perspective. Moreover, some grammar books (Freeborn, 1987; Z.-Y. Jiang, 2009; Pullum & Huddleston, 2002) and research papers in respect of prepositions (Boers & Demecheleer, 1998; Cheng, 2006; Lindstromberg, 1991, 1996; Tang, 1981) were also brought into the investigation.

The target documents were carefully read and the information was organised for the further interpretation. Besides, the data analysis was done with triangulation among various data sources so that the impact of bias could be eliminated and creditable evidence could be drawn (Bowen, 2009; Denzin, 1970). After investigating and classifying the evidence across various data, it is believed the conceptual meanings of English in, on, and at can be deduced.

4. FINDINGS AND DISCUSSION

By carefully reading, analysing, and classifying the data from the collected documents, the results are reported in the following sections. The meanings of three prepositions, in, on, and at are firstly reported separately. Later, the variation of them is discussed.

Meanings Expressed by the Spatial Preposition *in*

The English preposition *in* includes at least five different but related meanings. Firstly, the prototypical meaning with which people are deeply familiar presents the sense that a trajectory NP is inside a landmark (Coventry, Valdes, & Guijarro-Fuentes, 2010; Lindstromberg, 2010). Figure 3 demonstrates the relationship between the trajectory and landmark, which is expressed by the prepositions *in*. As a result, *in* illustrates the concept of a three-dimensional boundary so the yellow circle (trajectory) is inside the rectangle (landmark).

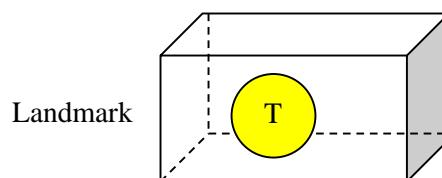


Figure 3. The prototypical meaning of English *in*

However, Nishimura (2005, p. 131) points out that the concept of BOUNDARY might be varied as *in* can be applied to diverse landmarks, such as a line, a section, and the whole (a circle). Table 1 visualises some images, which to some extent express the idea BOUNDARY. It is deemed that that conceptual metaphor (Lakoff & Johnson, 1980) and the gestalt law of closure (Yeh, 1999) should be brought into the discussion. People's everyday communication implies that they may think of a one-dimensional line and a not fully closed section as a full two-dimensional or three-dimensional space so the preposition *in* can be employed to form different linguistic utterances, e.g. *in line*, *in the city*, and *in school*. The gestalt law of closure can explain these linguistic expressions because people can imagine and convert not fully connected segments as a fully closed landmark, e.g. a city.

Table 1. Visual images of BOUNDARY revealed by *in* (Nishimura, 2005, p. 131)

Vis ual im ages	a line	a section	an area	a circle
	— —	— —	▲ ▲	○ ○
Exa mples	in line in order	in the country in the town in the city	in the society in the office	in a circle in the team in all in school

Secondly, the expression *in line* is spoken as the line is metaphoricalised as space. For example, it can be said that there is a capital C in the line of XXXCXXX. In addition, when several persons are arranged in a linear order, it can be described as several people are

waiting in line. Thus, two metaphors, which are A SEQUENCE IS A LINE and A LINE IS SPACE, can be found so the preposition in can be employed to show 3D line space.

Thirdly, the preposition in has both static and kinetic meanings. The static meaning refers to the prototypical meaning of in presenting the trajectory's position is surrounded by the landmark. In addition to this, Nishimura (2005, pp. 133-137) uses the example the teacher is in to explain. The kinetic meaning of in shows 'something has been added into somewhere'. The teacher is in presents a result after a movement, which is not mentioned or implicit in this expression. Although the reason is not clearly pointed out, language users still can understand the sentence because they have the schema of movement in their mind. The teacher is originally not here but he comes to here now. Nevertheless, Lindstromberg (2010) argues that this example is an exception because the landmark of in should be explicit. Accordingly, as in shows a result of a movement, he is in London implies that he went to London. This is one of the implicatures of the preposition in.

The fourth meaning of in can be exemplified by the grammatical structure, be verb + past participle + in (Nishimura, 2005). For example, when using the pattern be interested in + Ving, it implies that certain experience has already been tasted by the subject. I am interested in playing basketball implies that I have already experienced the event 'playing basketball' and after that, I start to love doing this activity. Furthermore, the metaphor AN EVENT IS A PLACE/SPACE/CONTAINER can be suggested explaining this kind of expression because the NP after the phrase be interested in is metaphorically converted into space. Therefore, the subject can be 'in' the event, just like the subject is in 3D space.

The final meaning expressed by in is also a metaphor, which is "STATES, CONDITIONS, CIRCUMSTANCE, ACTIONS, MOODS, etc. ARE SPACE" (Lindstromberg, 2010, p. 77). In people's everyday expressions, many ideas, e.g. love, game, and war, are metaphoricalised as various space so the experiencer can go into, go out of, and go through them. For example, they are in love shows love is space so they can be inside the scope of loves. The idea is similar to Reddy's (1993) conduit metaphor, which points out that language is a container as well as an ontology because languages can hold meanings and convey the meanings to another person. Hence, when the preposition in is prefixed to a NP referring to states, conditions, circumstance, actions and moods, the NP is thought as space.

Meanings Expressed by the Spatial Preposition at

The prototypical meaning expressed by at shows the concept of 'a point' and most of its extended meanings to some degree imply the idea of point, too. Lindstromberg (2010, p. 173) further suggests that "using and understanding AT in its spatial meaning often involves a mental act of 'zooming out' so that the Subject and the Landmark are visualised from such a distance that they merge into a single point". For example, by zooming out the view of the location London, the phrase in London can become at London because the reference point of distance becomes farer and higher (Lindstromberg, 2010, pp. 174-176). In addition, at can also demonstrate 'a point on a route', e.g. the train from London to Edinburgh will call at York, as well as the point on a scale, e.g. at 37 degrees centigrade. Furthermore, at can be employed to present a contact with the edge of a landmark (Herskovits, 1987, p. 131; Lindstromberg, 2010). Figure 4 illustrates two pictures showing the relationship between the trajectory X and the landmark table. One can describe the relationship in Figure 4-A as X is at the table, which means X is at the edge of the table. However, X is at the table cannot be employed to describe Figure 4-B because the location of X is not at the edge of the landmark. For Figure 4-B, it can only be said that X is on the table or X is placed near the edge of the table. According to the examples above, two metaphors can be drawn. One is A SPECIFIC PLACE IS A POINT, e.g. at the table, and the other is A SPECIFIC GRADUATION ON THE SCALE IS A POINT, e.g. at 37 degrees and at the price of 210 US dollars.

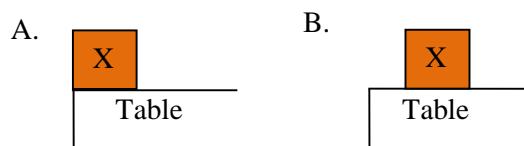


Figure 4. At the table vs. on the table

More idiomatic expressions of at are also considered being generated from those metaphors mentioned. For instance, when at precedes a proper noun, e.g. at the Ritz and at the Hilton hotel, the proper noun is thought as a point, which is derived from A SPECIFIC PLACE IS A POINT (Herskovits, 1987, p. 131; Lindkvist, 1978). Furthermore, A TARGET IS A POINT metaphor is also found in people's everyday life because a target can be a focal point or an aim, which entails the sense of a specific point, e.g. they look at us and try to get some directions (Lindstromberg, 2010; Nishimura, 2005).

Additionally, Nishimura (2005) indicates that at also can show the relationship between a cause and an effect. For example, I am very pleased at this news and I am very surprised at his sudden death (Nishimura, 2005, pp. 46-47) both present the relationship between reasons and results. Nishimura elucidates them as the agent starts to feel pleased and surprised 'at the moment' of hearing this news and knowing the information of someone's death respectively. In this case, the preposition at is applied because the concept of time intimately connects with the concept of space. Hence, because a temporal point is usually thought as a spatial point in people's conceptual system, people's conceptualisation of time may function to help people's interpretation of English prepositions. The idea of time and space are closely connected. They can be employed to understand each other (Lakoff & Johnson, 1980).

Meanings Expressed by the Spatial Preposition *on*

Comparing with the prepositions at and in, Lindstromberg (2010, pp. 51-56) points out that the spatial preposition on is relatively different in English. The prototypical meaning of on can be deduced as it has the opposite meanings to the preposition off, e.g. put on vs. put off. The spatial preposition on generally presents a trajectory is in contact with the surface of a landmark which functions to support the trajectory from gravity (Coventry et al., 2010, p. 84; Herskovits, 1987, p. 140), as can be seen in Figure 5. In addition, the trajectory not only can be on the top side of the landmark, e.g. on the table, but also on the left or right side, e.g. on the wall. The trajectory can also be on the bottom side of the landmark, e.g. on the ceiling. As long as the trajectory is 'sustained' by the landmark 'with a contact', the meaning of on is demonstrated. Moreover, on is also opposite to the concept of back, which implies the concepts of movement and orientation. For instance, when you say come on to someone, it entails that someone's location is opposite to you and you would like the hearer to come closer to you. The moving direction is from somewhere toward the location where you are.

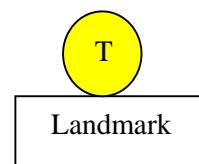


Figure 5. The prototypical meaning of *on*

Another meaning expressed by on is end-point connection (Herskovits, 1987, p. 148; Lindstromberg, 2010, p. 52). For example, the concept expressed by both the campgrounds are right on the ocean and the balloon is on the end of a string can be visualised by the trajectory and landmark relationship shown in Figure 6. Unlike the prototypical meaning of

on, the landmark in Figure 6 is presented as a dotted rectangle because the trajectory is in contact with the end of landmark but the landmark might not bear the landmark, e.g. the campgrounds are right on the ocean. Both sentences entail the sense of end-point connection, which is expressed by the preposition on.



Figure 6. The end-point connection concept of on

Interestingly, Lindstromberg (2010, pp. 61-64) specifically indicates that 'burden metaphor' and 'basis metaphor' are resided in people's mind and presented in their language. Burden metaphor can be investigated in the example it's unfair on us, which shows an unwelcome feeling comes into one's mind. This feeling is treated as pressure being on a person. However, Lindstromberg also suggests that on one's mind is different from in one's mind because the latter one does not imply the unwelcome feeling in English. He explains something is on your mind implies that you are not happy to have the something in your mind. Besides, the expressions, on purpose, depend on, and rely on, entail the basis metaphor (Lindstromberg, 2010). Extended from the prototypical meaning of on, abstract landmarks can be described. For instance, relying on your proposal, our company will earn more money in this quarter means that your proposal functions like a base to help our company earn more money. Otherwise, our company cannot earn more money. Your proposal is the landmark functioning to support our company, the trajectory. It is therefore can be portrayed by the preposition on because the prototypical on presents the meaning of a borne landmark. In addition, the term 'base' is employed to describe a concrete landmark, e.g. table, while 'basis' refers to an abstract landmark, e.g. purpose.

Similar to the preposition in, on also has its dynamitic meanings, such as move on. Nishimura (2005, pp. 89-119) argues that on presents several kinetic meanings. The schema of sun movement is brought to exemplify kinetic on as the sun appears on the opposite side of you in the morning and moves continuously with a curve-shape track. Accordingly, the image of the sun rising expands the meaning of on, such as the sense of appearance. For example, the actors are on implies someone or something is ready and appears on the stage, which is on your opposing side. Lindstromberg (2010, p. 65) connects the sense of "accessibility, availability, existence and currency" to the kinetic meaning of on. When something appears within your vision, it implies the thing's existence and it can be accessed. The sense of 'currency' refers to a state of affairs, e.g. it's on sale (Lindstromberg, 2010, p. 65). Subsequently, the appearance sense can be further extended and generated another meaning of on, which is a cause and effect relationship. When something is prepared and on, the cause is that the preparation is done and the effect is something can be shown or presented. For the example the play is on, it means the actors are ready to do their performance and get onto the stage. Although some information is not indicated in the expression, the result is certainly formed by the previous preparation. Thus, the cause and effect sense of on is suggested and drawn.

According to the sun movement image, 'the sense of continuity' and the 'TILT' concept can be further suggested because the sun moves continually with an arc-like track. The sense of continuity of on demonstrates a continuous progress of moving. For example, he is on duty refers to someone is currently within an action and walk on and on explains nonstop walking. The phrase on duty presents a continuous duration of work and it is not like at work, which displays a temporal point within a whole working time (Nishimura, 2005). More expressions with the same idea can be accessed, e.g. on business, the light is on, and on job. They all specify a nonstop state. Besides, he is on the way to the airport is also in respect of a continuous movement because the agent is still within the action of moving from

somewhere to the airport. In addition, which side are you on and I'm on your side express the metaphor APTITUDE IS A SIDE to present the sense of personal aptitude (Nishimura, 2005, p. 108). This metaphor is considered being generated from the prototypical meaning of on because a side of something is similar to the concept of a surface. Although the trajectory and the landmark do not have an actual contact, personal aptitude is metaphoricalised as a surface so the preposition on is applicable to form such kind of linguistic expressions.

Different Concepts and Variations of Prepositional Phrases

Preposition in, on, and at express different prototypical meanings but they sometimes may also function similarly. For instance, the sentences I am at the coffee shop and I am in the coffee shop both can generally refer to the same location. However, some conceptual differences exist between them. In line with the prototypical meanings, in reveals a concept of boundary and at shows a point. Therefore, in not only presents the trajectory's location but also additionally points out that the trajectory is inside the boundary of the landmark, which is the coffee shop. By contrast, I am at the coffee shop simply points out the location of the subject. The trajectory is not necessarily inside the shop. However, when saying I am in the coffee shop, the trajectory has to be inside the shop. According to Nishimura (2005), I am in the coffee shop can also be understood as I am at the coffee shop because the speaker zooms out the reference point.



Figure 7. The image of on line

On line vs. in line can be another pair of example. The concepts or images expressed by the two phrases are different. When a line is considered as a thin surface, on can be applied. Figure 7 reveals the concept of on line. Because people's reference point turns the line into a surface, the line can metaphorically support the trajectory or to show the continuous action.

In line, on the other hand, is a metaphorical expression and the line string is thought of forming by some components. For example, there are six people in line means the queue of the six people is metaphorically turned into a line. The queue is metaphoricalised as linear 3D space to surround those people. As illustrating in Figure 8, the sequence of the six circles structures the imagine of a line and it is further presumed space. Thus, the expression in line can be frequently accessed in people's everyday communication.



Figure 8. The image of a line-like space

One more example comes from at school vs. in school. The PP at school is spoken to specify the location of the school on the map. It is frequently treated as a linguistic chunk in English teaching in Taiwan. Teachers teach this prepositional combination as an idiomatic expression and hardly tell students why other prepositions cannot be applied and still express the same meaning. While at school is a spatial PP, in school refers to a temporal period of being educated. In school presents the sense of one's state as it is in line with the metaphor "STATES, CONDITIONS, CIRCUMSTANCE, ACTIONS, MOODS, etc. ARE SPACE" (Lindstromberg, 2010, p. 77). People have the prior knowledge that school is a place where official teaching and learning take place. The PP at school is employed to specify the place, e.g. I am at school, but in school converts the meaning of place to a temporal period, such as I am in school. The use of in school can be deemed as a kind of metonymy because the mapping occurs within the domain of school derived by TIME IS SPACE metaphor. The spatial sense of school is thought as the temporal period of being schooling. Additionally, the

mapping also operates between the concepts of space and time. I am in school means that I am within the period of being educated at the place of school. The TIME IS SPACE metaphor can be observed from the PP in school. One can be in this period/space and out of this period. Therefore, at school and in school not only have different meanings but also express different concepts.

Prepositions in, on and at Expressing the Most Basic Spatial Concepts

Recalling the prototypical meanings of the prepositions in, on, and at, the researcher suggests that they entail the most fundamental spatial concepts, e.g. point, 3D space, and surface, in people's conceptual system and further influence people's conceptualisation of other space. According to linguistic relativity, people's thought is influenced by their language (Whorf, 1956). The preposition in reveals the concept of 3D space. Through metaphorical thinking, the prepositions can be applied to varied landmark and express different meanings. Besides, people learn other but related concepts based on the understanding of in. For example, people understand the concept of in and then they can realise the meanings of inside/within. It is further extended to understand the notions of out/outside/without. In addition, on has relatively less extension but it contains wilder meanings than at and in. The sense of brace further generates the burden metaphor, basis metaphor and other meanings. The concepts of surface and side can be deemed as extended meaning from the prototype of on. Hence, it further presents the meanings which can be expressed by under, above, onto, behind, and on the back of. Importantly, the preposition at demonstrates the concept of point, which further functions as the base of other prepositions. For example, having the concept of point in mind, people can develop the uses of from/to, between, before/after, etc. The landmarks preceded by these prepositions entail the a spatial or temporal point. Some more linguistic usages are additionally suggested deriving from the concept of a static point expressed by at, e.g. from a point to another point and between two points.

5. CONCLUSION

This study reviews many studies and reports the conceptual meanings expressed by the English prepositions in, on, and at via document analysis. Prepositions in, on, and at not only have their prototypical meanings but also extended meanings (Evans, 2004; Herskovits, 1987; Kemmerer, 2005; Lindkvist, 1978; Lindstromberg, 1996, 2010; Nishimura, 2005; Tang, 1981). People's different viewpoint and metaphorical thinking can extend the meanings of prepositions. They not only function to help people's understanding of other spatial concepts but also have close relationship with temporal ideas. Moreover, different PP may express similar or the same meaning. The speakers' vantage points and intentions drive them to employ different special prepositions because they may want to highlight varied aspects the space. Therefore, EFL learners are suggested comprehending the conceptual meanings of in, on, and at, especially those which do not exist in EFL learners' mother tongues. In addition, because TIME IS SPACE metaphor resides in people's mind and it deeply influences people's experience of space and time, EFL learners have to understand how space and time are conceptualised in English native speakers' mind and reflected in the uses of prepositions. If the conceptualisation is not identical to the learners' embodied experience, linguistic mistakes may occur because of interference from the first language (Jarvis, 1998; Jarvis & Pavlenko, 2008; Terence Odlin, 2003, 2005). Language mirrors the speakers' thought (Whorf, 1956). Learning another language is like learning another ways of thinking.

The present study has some limitations as some literatures may be overlooked during the procedure of data collection. Besides, the research scope of the present study only focuses on spatial meanings of the three prepositions in, on, and at but when doing the data analysis, it is found some of the conceptual meanings cannot be explain without the connection with

the temporal meanings of the prepositions. Hence, further research can be done with more comprehensive previous studies. The temporal meanings of in, on, and at are another scope for further investigation to provide EFL learners more detailed information about English prepositions.

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