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“Physical Space First!”: A Corpus-based Study on the Use of Localizer ‘Shang’ in Early Child Mandarin

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Abstract

The study investigated the pragmatic use of localizer ‘shang (上)’ by 168 Mandarin-speaking preschoolers (aged 2;6,3;6,4;6,5;6) in the Early Childhood Mandarin Corpus (ECMC) (Li & Tse, 2011). Six types of pragmatic meaning of ‘shang (上)’ were proposed based on literature review, the four about physical space (including the meaning of supporting, attaching, higher position and containing) were produced by 62 children from the four age groups, whereas the two about psychological space were not found in the corpus. No significant age and gender differences were found in the production of ‘Noun (N) + shang (上)’ expression. The localizers, ‘shang (上, on)’ and ‘li (里, in)’ were often used interchangeably, although they have different meanings in spatial expression. The developmental trends of use of ‘shang (上)’ were discussed with reference to cultural context, cognitive development and language acquisition.

Keywords: early child Mandarin, spatial expression, locative terms, localizer, spatial perception
“Physical Space First!”: A Corpus-based Study on the Use of Localizer ‘Shang’ in Early Child Mandarin

Spatial expression plays an important role in daily communication and is a critical part of human language. Spatial relation in Chinese cannot be expressed by simply using prepositions; instead, it should employ a combination of prepositions and localizers (Chu, 2000). In the expression of ‘on the table’, for instance, ‘on’ is a spatial localizer and should be presented as ‘zai ... shang (在…上)’ in Chinese, in which ‘zai (在)’ is a preposition and ‘shang (上)’ is the spatial localizer. Therefore, Chinese children need to acquire these localizers to express spatial relation appropriately and purposively, which could be regarded as an important milestone in early language acquisition. Some studies have investigated the acquisition of Chinese localizers, especially its developmental sequence in the early years. Among all the localizers, shang (上) and li (里) were found to be the most frequently used and therefore, acquired earliest (Jia, 2000; Kong, 2003; Xiong, 2001). Chinese linguists proposed seven to ten types of pragmatic meaning of ‘shang (上)’ in spatial expression according to different standards proposed by these linguists (Gou, 2004; Tong, 2006), and some studies found that the two types with support and containment relationship were acquired earlier and better than that of the others (Jia, 2000; Xiong, 2001; Kong, 2003; Zhang, 1987). However, few studies have systematically and comprehensively examined the acquisition of the exact proposed types of pragmatic meaning of ‘shang’ in early childhood. This study endeavors to fill this gap by analyzing all the cases of ‘shang’ elicited from the Early Child Mandarin Corpus (ECMC, Li & Tse, 2011) and summarizing the patterns and trends in the use of ‘shang’.
Spatial expression in Mandarin Chinese

Spatial expression in Chinese involves some spatial lexicons that have varying semantic meanings, which accordingly bear on different pragmatic meanings in the sentence (Gou, 2004; Tong, 2006; Wu & Wei, 2007;). Chinese has two types of localizer: monosyllabic and disyllabic localizer (Chu, 1997). There are many disyllabic forms for the localizer Shang (上) such as Shangbian (上邊), shangmian (上面), shangtou (上頭), which serve to indicate the upper location like the monosyllabic form ‘上 (shang) ’ does (Lv, 1996). To express the similar meaning of ‘supporting’, like English localizer ‘on’ does, the Monosyllabic localizer shang (上) is conventionally used with the structure of ‘Noun (N) + shang (上)’. In Chinese literature, shang (上) has six types of pragmatic meaning with the structure of ‘Noun (N) + shang (上)’, according to the conclusion from analyzing all the classifications of the researchers (Gou, 2004; Tong, 2006). It is of great interest to developmental psycholinguists to know when and how Chinese young children acquire these different types of meanings in the early years. This study aims to address these questions with the data elicited from a large-scale corpus.

In addition, Chinese localizers need to have a specific structure to express spatial relationship. In English, one just needs to use the preposition ‘on’ to express the spatial relation with the meaning of ‘support’, i.e., ‘on the desk’. In Chinese, however, one needs to employ the combination of ‘zai’ (preposition) and ‘shang’ (localizer) to express the same meaning: ‘zai zhuozi shang’ (在桌子上, on the desk). In this structure, ‘shang’ can be seen as a suffix of the noun ‘桌子 (desk) ’ to indicate its location (Chu, 2000). This ‘N(Noun) + L(Localizer)’ structure is very commonly used in daily Chinese discourse as
it can apply to other localizers such as *li*(里), *xia*(下), and so on (Zhu, 2000). Therefore, acquiring this structure and its pragmatics will be a remarkable milestone in early child language acquisition. Below are four examples of this structure:

Example #1

<table>
<thead>
<tr>
<th>N</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>地板</td>
<td>上</td>
</tr>
</tbody>
</table>

Diban *shang*

Floor on

‘On the floor’

Example #2

<table>
<thead>
<tr>
<th>N</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>床</td>
<td>上</td>
</tr>
</tbody>
</table>

chuang *shang*

bed on

‘On the bed’

Example #3

<table>
<thead>
<tr>
<th>N</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>山</td>
<td>上</td>
</tr>
</tbody>
</table>

shan *shang*

Mountain on

‘In the mountain’

Example #4

<table>
<thead>
<tr>
<th>N</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>天</td>
<td>上</td>
</tr>
</tbody>
</table>

Tian *shang*

Sky on

‘In the sky’

**The Pragmatics of the localizer ‘shang (上)’**

Semantics refer to the original or ordinary meanings of a word in a language and can only be used in certain sentences, whereas pragmatics conveys extended meaning beyond the original ones within context (Griffiths & Patrick, 2006). In Chinese, the original meaning of *shang (上)* is ‘high altitudes’, and its ordinary meaning which is commonly used is ‘on
the surface of the objects’ and ‘supporting’ (Chinese Modern Dictionary, 2016). However, it has many extended pragmatic meanings, one of which serves to convey the locative meaning of ‘in certain range of some object’. Each of the pragmatic meanings is highly associated with the distinctive feature of the object being described and their corresponding spatial relations (Liu, 1994). For instance, when saying ‘在桌子上 (zai zhuozi shang, on the table)’, people focus on the supporting function of the table (N) and the spatial relation between the object and the table; however, ‘在窗户玻璃上 (zai boli shang, on the glass of window)’ guides people’s attention to the ‘attaching’ surface of the window glass. Similarly, in English, the distinctive pragmatic meanings of ‘on’ could lead to the preference in focus for the described object. For example, in ‘he climbed on to the roof’, the ‘roof’ is regarded as destination; while in ‘he was on the roof’, the ‘roof’ is considered as position (Wu & Wei, 2006). Therefore, young children need to acquire all these semantic and pragmatic meanings of ‘shang’ in Chinese to express spatial relationships appropriately. Analyzing children’s pragmatic use of ‘shang’ will allow us to better understand the development of spatial concepts and expression in the early years.

However, linguists have different views on the pragmatics of ‘shang’ in Mandarin Chinese. Gou (2004) proposed a seven-type framework to understand the pragmatics of ‘shang’ in Mandarin Chinese according to the status and features of ‘N’ in the structure of ‘N + shang (上)’ : (1) ‘N’ has the function of supporting, e.g. ‘桌子上 (zhuozi shang, on the table)’; (2) ‘N’ has the function of presenting, e.g. ‘黑板上 (heiban shang, on the blackboard)’; (3) ‘N’ is around the upper position in the view of the speaker, e.g. ‘天花板上 (tianhuaban shang, near the ceiling)’; (4) ‘N’ has a status of attaching with something,
e.g. ‘窗戶上 (chuanghu shang, on the window)’; (5) ‘N’ has the function of containing, e.g. ‘車上 (che shang, in the car)’; (6) ‘N’ is the aspect of something, e.g. ‘思想上 (sixiang shang, of one’s mind)’; and (7) ‘N’ is just an abstract nouns, e.g. ‘邊防線上 (bianfangxian shang, on the frontiers of)’. Tong (2006), however, argued against this seven-type framework and suggested to classify the pragmatic meanings according to their cognitive distinctions, which is shown as follows: (1) Group One considers ‘shang (上)’ as the locative expression to describe the physical space, and has three types of pragmatic meaning: (a) referring to the higher location; (b) referring to the vertically spatial relation ‘up/above’; and (c) referring to the inside of the described container; (2) Group Two uses ‘shang (上)’ to express the psychological space instead of the physical space, and could be further classified into seven subtypes according to the described object (‘N’): (a) ‘N’ is a concrete noun expressing certain spatial metaphor, e.g. ‘生命線上 (shengmingxian shang, on the lifeline)’; (b) ‘N’ refers to psychologically existing place, e.g. ‘電視上 (dianshi shang, on TV)’; (c) ‘N’ is an abstract noun that expresses spatial metaphor, e.g. ‘歷史上 (lishi shang, in history)’; (d) ‘N’ refers to some events, e.g. ‘會議上 (huiyi shang, in the meeting)’; (e) ‘N’ is an abstract noun referring to involved scope, e.g. ‘經濟上 (jingji shang, economically)’; (f) ‘N’ is an abstract noun referring to perspective aspect of objects, e.g. ‘名義上 (mingyi shang, nominally)’; and (g) ‘N’ is abstract noun referring to the philosophical aspect of objects, e.g. ‘人權問題上 (renquanwenti shang, on humanitarian questions)’. This framework is very complicated thus cannot be used to examine the early acquisition of pragmatics of ‘shang’.

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Having compared the existing frameworks, we found that shang (上) has diversified pragmatic meanings according to the semantic meaning of N in the same collative structure. In this sense, the classification proposed by Tong suits the need of the present study more as it divided the types of pragmatic meanings of shang (上) according to the cognitive concentration. However, the second group of Tong’s classification is too complicated for analyzing the production of the children in the early years. Hence, we proposed the following six types of the pragmatics of ‘shang (上)’ to be examined with the corpus.

(1) M1: Supporting the object (indicating the location in physical space and cognitively focusing on the supporting function of object)

蘋果 在 桌子 上

pingguo zai zhuozi shang

Apple P Table on
‘The apple is on the table.’
Pragmatic meaning: The table is supporting the apple.

(2) M2: Attaching the object (indicating the location in physical space and cognitively focusing on the attaching relation between the objects and the attached point, line or surface)

黏 在 窗戶 上

nian zai chuanghu shang

Stick P the window on
‘stick on the window’
Pragmatic meaning: glued to the window

In particular, corresponding to the 3-D features of the object, M2 could be further classified into three subtypes: Subtype 1: M2-point, e.g. ‘點上 (dian shang, on the point)’; Subtype 2: M2-line, e.g. ‘線上 (xian shang, on the line)’; Subtype 3: M2-plane, e.g. ‘面上 (mian shang, on the plane)’.

(3) M3: Locating the object in the higher position compared with the horizon position of the speaker (indicating the location in physical space and cognitively focusing on the object-location of vertical relation with other objects)

小鳥 在 天空 上

xiaoniao zai tiankong shang

Bird P sky on

‘The bird is in the sky’

Pragmatic meaning: The bird is flying in the sky (so that the position of the bird is higher than the speaker)

(4) M4: Containing (indicating the location in physical space and cognitively focusing on the containing function of object)

手 上

shou shang

Hand on

‘in the hand’
Pragmatic meaning: contained in the hand

(5) M5: Involved scope of things (extending meaning of *shang* in physical space to psychological space and focusing on the scope of things)

電視 上

dianshi *shang*

TV on

‘in TV program’

Pragmatic meaning: in the TV program

(6) M6: Philosophical aspect of things (extending meaning of *shang* in physical space to psychological space and focusing on the aspect of things)

經濟 上

jingji *shang*

Economy on

‘in economy’ or ‘economically’

Pragmatic meaning: in the aspect of economy

In summary, in this newly proposed framework, M1 indicates the supporting function of the object; M2 emphasizes the attaching/sticking/bonding relationships according to the features of ‘N’ which could be point/line/plane; M3 discloses the higher location in vertical view, M4 highlights the containing feature, M5 and M6 refer to the ‘psychological space’ and focus on the involved scope and philosophical aspect of things, respectively (Fang, 2002; Wu & Wei, 2007; Gou, 2004; Tong, 2006). We hypothesize that
young children might have some difficulties to understand and acquire the fifth and sixth pragmatic meaning of ‘shang (上)’, which highly demand the speakers’ understanding of the ‘psychological space’. This study will examine the corpus data to see whether children aged from 2 to 5 use the six pragmatic meanings in their daily communication.

**The interchangeable localizer of ‘shang (上)’**

In Chinese, there are some localizers that could be used interchangeably, for instance, shang (上) and li (里) share some common pragmatic meanings when referring to spatial relationship in physical space (Gou, 2004). In some spatial expressions regarding physical space, ‘shang (上)’ could even be replaced with ‘li (里)’, which also conveys the meanings of supporting and containing. As shown in the following examples, they share the same pragmatic meaning and could be interchangeable.

(1) Spatial Expression with ‘shang’

玩具 在 車 上

Wanju zai che shang

Toys P car on

‘Toys are in the car’

Pragmatic meaning: Toys are contained in the car.

(2) Spatial Expression with ‘li’

玩具 在 車 里

Wanju zai che li
Toys in the car

‘Toys are in the car’

Pragmatic meaning: Toys are contained in the car.

However, Ge (2004) and Tong (2006) argued that when expressing spatial range, even though ‘shang’ and ‘li’ could be interchangeable, the structure of ‘N + shang’ and ‘N + li’ could have different meanings, as ‘N’ itself could change its meaning depending on the associated localizers. As shown in the following two examples, ‘手上 (shou shang, on the hand)’ and ‘手里 (shou li, in the hand)’ have similar but noticeably different meanings. The similar meaning is that the object is held in hand. But, ‘手上 (shou shang, on the hand)’ implies the open hand, whereas the second ‘手里 (shou li, in the hand)’ indicates clenched hand (Tong, 2006). Apparently, ‘手里 (shou li, in the hand)’ and ‘手上 (shou shang, on the hand)’ are interchangeable to indicate the location of the object, however, they differ in the cognitive foci and the meaning of N.

(1) Containing (cognitively focusing on the containing function of object and recognizing the open status of the hand: the object is supported by an open hand.)

手上

Shou shang
Hand on
‘in the hand’

Refined meaning: contained in open hand
(2) Containing (cognitively focusing on the containing function of object and recognizing the clenched status of the hand: the object is held in a clenched hand.)

手 里
Shou li
Hand in
‘in the hand’

Refined meaning: held in clenched hand

This means that young children will have to acquire the nuance of pragmatics in ‘shang (上)’ and ‘li (里)’ and other similar interchangeable localizers to be a mature and skillful communicator in Chinese. Therefore, this study will also analyze the similar cases elicited from the corpus to investigate whether and when young children could understand and express the nuance of pragmatics between ‘shang (上)’ and ‘li (里)’ in their spatial expression. Accordingly, this study will elicit all the natural utterances with localizers produced by 168 Mandarin children from the corpus, with a focus on the pragmatics of ‘shang (上)’ in the structure of ‘N + Shang (上)’ and its replacement ‘li (里)’. The following questions guided the present study:

1. How many types of pragmatic meaning of ‘N + shang (上)’ could be identified from the sample? When could Mandarin-speaking young children use them? Are there any significant differences of age or gender in producing these types of pragmatic meaning of ‘N + shang (上)’?
2. How many cases of interchangeable use of ‘shang (上)’ and ‘li (里)’ could be found from the corpus? Did the children realize the nuance difference between 'shang (上)’ and ‘li (里)’?

Method

The Corpus

The Early Childhood Mandarin Corpus (Li & Tse, 2011) used in this study collected all the utterances produced by 168 Mandarin-speaking preschoolers that were randomly sampled from each class of the 8 participating preschools located in four major districts of Beijing: Chaoyang, Dongcheng, Xicheng, and Haidian. This sample represented children from four age groups (ages 2;6, 3;6, 4;6, and 5;6), with twenty-one boys and twenty-one girls in each age group. All participants were native speakers of Mandarin, and their parents and teachers also spoke Mandarin at home and in the preschool respectively.

Communication Task

All the participants were randomly paired (boy/girl, boy/boy, or girl/girl) and encouraged to play and talk with each other in this task. A toy play context area furnished with a set of toys, including cooking materials, food and fruits, furniture and electrical appliances, and hospital materials and vehicles, was set up in the participants’ classroom. Only one pair of participants was allowed to play in the room for 30 minutes. Their conversations during playtime were audio-recorded using an unobtrusive and high-fidelity recorder, as well as observed uninterruptedly by the researchers. All the conversations were transcribed by experienced research assistants (RAs). All the spatial
expressions were first identified by a research assistant and then confirmed by a panel of Chinese linguists.

**Coding of Mandarin spatial localizer ‘shang (上)’**

The six-type pragmatic meaning framework we proposed above was used to code all the locative expressions with ‘shang (上)’: M1 for supporting, M2 for attaching with point, line and plane, M3 for higher location, M4 for containing, M5 for scope of things, M6 for aspects of things. All the data were divided into halves and two trained RAs coded each half based on the coding systems. Before starting the formal coding, the two coders coded six paired cases selected from each half. The percent agreement on the 12 paired cases was 93.8%, indicating excellent inter-rater reliability.

**Result**

The 168 Mandarin speakers produced 703 locative expressions, of which 29.30% (tokens=206, n=168) used the localizer ‘shang (上)’. In addition, 49.5% (tokens=348, n=168) of the locative expressions involved ‘li (里)’, which turned out to be the most frequently used localizer in early child Mandarin. Almost every child produced the locative expression with ‘li (里)’, but only 79 of the 168 children used ‘shang’, indicating that ‘li’ rather than ‘shang’ was more frequently used in early child Mandarin. One-way ANOVA on the tokens with Age as the independent variable found a statistically significant difference among the four age groups in producing localizer ‘shang (上)’ in both Monosyllabic and Disyllabic form, F(3, 112)=3.041, p=.032.

In particular, the first four types of pragmatic meanings of shang (M1, M2, M3, and M4) were identified from the locative expressions made by these Mandarin young
speakers aged 2;6 to 5;6, whereas the last two types -scope (M5) and aspects (M6) of things were not found. The pragmatic meaning of supporting (M1) was most frequently used (45.22%), followed by the meaning of attaching (M2) (30.43%), the meaning of higher location (M3) (3.04%) and finally, the meaning of containing (M4) (11.30%). In addition, M1 and M2 were used by the four age groups, M3 was not found in the groups under 3;6, and M4 was not found in the groups under 4;6. Further analysis indicated that all the age groups were able to produce the three subtypes of M2: attaching with point, line and plane except for the group of 2;6, who did not use the meaning of ‘attaching with plane’.

Analyses on the extracted sentences from the cohort found that 32 types of nouns were involved with the structure of ‘N + shang (上)’. Among them, six types were M1, seven were M2-point, one was M2-line, nine were M2-plane, five were M3, and four were M4. The 32 types of nouns could be classified into five groups as follows (See Table 1): (1) (part of) body: tou shang (头 上), bozi shang (脖子上), shou shang (手上); (2) furniture: zhuo shang (桌上), chuang shang (床上), shafa shang (沙发 上); (3) place or building: caoping shang (草坪上), fangding shang (房顶上), lou shang (楼上); (4) high location: like tian shang (天上), shan shang (山上), shu shang (树 上); and (5) daily object: majiang shang (麻 将 上), dangao shang (蛋糕 上).

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Insert Table 1 about here

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In addition, 55.83% (115 of the 206) of the ‘shang (上)’ cases was used with the ‘N + shang (上)’ structure, which were produced by 62 children. This structure was most frequently used among the ‘shang (上)’ cases in the corpus. One-way ANOVA on Age effect found that there was no significant difference among the four age groups, F(3, 58)=0.423, p=.737. However, an increasing trend in the productive size towards the pragmatic meanings in the four age groups was found, with 11.30% of the 2-year-olds, 12.17% of the 3-year-olds, 26.09% of the 4-year-olds, and 50.43% of the 5-year-olds. Specifically, each of the subtypes of the four pragmatic meanings of shang (上) (M1, M2, M3 and M4) produced by these children was found to increase by age as shown in Table 2. And a noticeable increase was observed between Age 4;6 and Age 5;6 (see Figure 1).

Chi-square test found that there was no statistically significant gender differences in producing the different types of pragmatic meanings of shang (M1, M2, M3, and M4), \( \chi^2(5) = 7.920, p = .161 \).

Findings also revealed the interchangeable use of shang and li. In the use of M4-containing of ‘shang (上)’ such as ‘guo shang（鍋上）’, ‘shou shang（手上）’, ‘che shang（車上）’ and ‘feiji shang（飛機上）’, there was a trend of using the ‘N + li（里）’ structure to refer to M4-containing, i.e., ‘guo li（鍋里）’ (across four age
groups), ‘shou li (手里)’ (aged 2;6 to 3;6), ‘che li (车里)’ (aged 5;6). In addition, the ‘N + li (里)’ was also used to express the M2-attaching, such as the M2-point type ‘dangao li (蛋糕里)’ (aged 5;6), ‘erduo li (耳朵里)’ (aged 5;6), and the M2-plane type ‘duzi li (肚子里)’ (aged 3;6 to 4;6) and ‘men li (门里)’ (aged 3;6).

Discussion

The present study found that four types of pragmatic meanings were used in 32 types of the ‘N + shang (上)’ structure in the Corpus. This finding suggests that the sampled children in Beijing have acquired the basic pragmatics of the localizer ‘shang (上)’ at a very early stage, which is consistent with the findings of other studies (Jia, 2000; Xiong, 2001; Kong, 2003). The four types of pragmatic meanings have different levels of the quantity of spatial information, which required different stages of development of the language and cognition (Liu, 1994). In this sense, from the use of the ‘N + shang (上)’ structure by the Beijing preschoolers, a developmental trend could be identified to understand the acquisition of the related spatial expression and concepts in early years: physical space first (in preschool years), and psychological space second (primary school years or later). This section will highlight the two major findings and explore their implications for psycholinguistics and early childhood education studies.

Physical space first

The present study found the ‘N + shang (上)’ structure to be the most frequently used among all the spatial expressions for the localizer shang (上) (55.83%). As children aged, there was an increased usage of this structure. This finding indicated that Mandarin-
speaking children might still be developing their abilities of using the ‘N + _shang_ (上)’ structure to express location in the early years, even though they have acquired the basic pragmatics of ‘_shang_ (上)’. This has provided cross-linguistic evidence to support the developmental theory of language acquisition in early childhood (Piaget & Inhelder, 1956; Johnston & Slobin, 1979; Casasola & Cohen, 2002).

However, among the six types of pragmatic meaning of ‘_shang_ (上)’ in the ‘N + _shang_ (上)’ structure, four about physical space were used by the Mandarin-speaking young children in Beijing. The two advanced levels about the psychological meanings of ‘_shang_ (上)’ were not found in this study. This finding indicated that those young children might have not acquired abstract concepts, such as the scope and aspect of things associated with M5 and M6. According to Piaget and Inhelder (1956), young children were still in the preoperational stage (aged 2-7) and could not understand some concrete logics, not to mention abstract concepts. Only from the formal operational stage (after about age 12), children can understand and express abstract concepts in daily communication (Piaget & Inhelder, 1956). Therefore, follow-up studies are needed to understand when Mandarin-speaking children can understand and use the two types of psychological meanings of ‘_shang_ (上)’, which can be a signal of the acquisition of the concepts of ‘psychological space’.

Although no significant gender or age differences was found in the use of ‘N + _shang_ (上)’ structure, developmental trends and patterns were found. In particular, M1 and M2 were acquired by the age of 2;6, M3 by the age of 4;6, and M4 by the age of 5;6. This developmental trend may be related to children’s cognitive development at different
ages, indicating cognitive preference and ‘blind spot’ in spatial perception in young children (Clark, 1973; Kelly, 2002). For example, no utterance with the plane-type meaning of M2 was found in the 2;6 group, which may be related to the limited cognitive ability of 2-year-olds, who could not differentiate the point, line, and plane features of an object. The absence of the usage of specific pragmatic meanings provides some insights on the progress of the development of spatial concepts in the early years (Liu, 2000; Fang, 2001; Bowerman, 2006).

The interchangeable use of ‘Shang (上)’ and ‘li (里)’

‘Shang (上)’ and ‘li (里)’ have been found to be used interchangeably by Mandarin-speaking adults (Fang, 2002). This was also reflected in this study with young Mandarin-speaking children in Beijing. This finding indicated that young children had acquired the language skill associated with using interchangeable terms and could use it appropriately. Both the ‘N + shang (上)’ structure and the ‘N + li (里)’ structure expressed the meaning of containing. Fang (2002) suggests that a speaker using the two structures can understand the two features of the same object. For instance, in the pair of ‘Che shang (上)’ and ‘che li (里)’ structures, children use ‘che shang (上)’ to express their understanding that the car (che) is a supporting object, whereas they use ‘che li (里)’ to highlight its function of containing (Liu, 1994). In the present study, only two speakers (aged 5;6) produced ‘che li (里)’ while all the other speakers used ‘che shang (上)’. This finding indicated that the mature speakers could have better perception or understanding about the spatial information of the same object than the younger ones. Similar cases were also found, for example, some children aged 5;6 used ‘dangao li (里)’ (in the cake)
and ‘erduo li (里)’ (in the ears) to better express the spatial information of the target objects. In this connection, using ‘li (里)’ to replace ‘shang (上)’ to express more precise locative information of objects might be a reliable indicator to show that the speaker has acquired spatial concepts and their appropriate expressions. This could be assessed in early childhood language tests to understand the developmental levels of early years. This implication, however, needs further studies to verify.

It is widely believed that children could understand spatial relationships if they could talk about it with spatial languages (Bowerman, 1996). The present study found that all four groups of children could use the five groups of noun objects in the ‘N + shang (上)’ structure with four pragmatic meanings to represent their body, furniture, high location, place and building, and something that is attaching to but under the described object. Piaget and Inhelder (1956) proposed that children first develop the egocentric reference, followed by the allocentric reference in their spatial representation system. Accordingly, children in the present study may have developed to the stage of allocentric reference, as they could use the ‘N + shang (上)’ structure appropriately and correctly in daily communication. Further studies may be needed, however, to verify this assumption.

The present study has some limitations. First, it is limited to the data elicited from a large-scale corpus with children aged two to five in Beijing. Some experiments in terms of the language ability in producing spatial expression in the structure of ‘N + shang (上)’ could be conducted to obtain a holistic picture of early acquisition of ‘shang (上)’ pragmatics. Second, it is limited to the play context established by the corpus. Young
children’s natural speech is dependent on the context. Children might be able to use more spatial expressions in other contexts, such as home or school activities. Third, spatial expression is more demanding than spatial comprehension for young children during 30 minutes of free play, as spontaneous speech involves the selection of appropriate localizers, the creation of rational phrases and the organization of sentences (Li & Tse, 2011). In real life, they may have more contexts and chances to use ‘shang (上)’ and ‘li (里)’ and other advanced levels of the pragmatic meanings such as M5 and M6 proposed in the present study. Therefore, more studies and especially, experiments are needed in this area to further investigate the performance of using and understanding these pragmatic meanings in the real life of the preschool children.
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