

HOW DO CHINESE L1 LEARNERS EXPRESS ESTONIAN STATIC SPATIAL RELATIONS?

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Abstract. The aim of this research was to find out how differences in Chinese and Estonian spatial language influence the way Chinese L1 speakers acquire the Estonian system of expressing static spatial relations. For this purpose, a picture description task was carried out by 22 native Chinese speakers.

The main finding was that the Chinese L1 learners of Estonian did not use support through attachment relation (expressed by the postposition *küljes*) or support by the tip relation (expressed by the postposition *otsas*) almost at all. Instead, they used simple support relations (expressed by the adessive case or the postposition *peal*) similarly to their native language, which was in stark contrast with the native Estonian usage. Expressing containment relations did not pose such a problem to Chinese learners of Estonian.

Another important finding was that Chinese learners of Estonian had a higher probability of using native-like logic in Estonian in choosing between support and containment relations while describing the pictures when they used case suffixes and a lower probability when they used adpositions.

Keywords: L2 spatial language, spatial relations, containment, support, location markers, language typology, Estonian, Chinese

1. Introduction

The present article is the first attempt to find out how the similarities and differences in the expression of static spatial relations in Estonian and Chinese influence the way Chinese learners of Estonian (abbreviated as CLE throughout the rest of the article) express static spatial relations in Estonian. For this purpose, a picture description task was carried out by 22 CLE. Each participant described 39 pictures with different kinds of static spatial relations from the topological relations picture series by Bowerman and Pederson (1992). It was also important to consider whether there were any other factors that could influence the usage of

Estonian by CLE, such as the teaching methods and textbooks that have been used. To my knowledge, only two earlier studies have dealt with the usage of Estonian by CLE (Tarkin 2019, 2021), but none with the usage of Estonian spatial language by CLE.

Both Chinese and Estonian divide different static spatial relations into containment and support relations. Like English, they use two different sets of location words or suffixes, not three as Dutch or one as Spanish (see Figure 1) (Bowerman, Choi 2001). In Estonian, it is possible (but not obligatory) to divide support relations into more specific subcategories. They are support via attachment (expressed by the postposition *küljes* ‘attached to’) and support via attachment to the top of an object (expressed by the postposition *otsas* ‘attached to the tip/top, at the tip/top’). In Chinese, like in English, there is only a distinction between containment and support without the possibility to divide support relations into more detailed subcategories. In addition, in Chinese the support relations are heavily dominant in usage to describe different kinds of static spatial relations, unlike in Estonian where support and containment relations are more or less evenly used (Bleive 2022). Also, in Estonian both locative case suffixes and adpositions are used, while in Chinese only adpositions are used.

The hypothesis for this research was that the dominance of support relations expressed by postpositions and the lack of distinctions between different kinds of support relations in the native language of CLE influence the way CLE acquire the usage of Estonian locative adpositions and case suffixes. The usage of postpositions to express different spatial relations mainly through a simple support relation without any division into subcategories by using the postposition *peal* ‘on’ should prevail in the language use of CLE. The case suffixes should be underused, especially those expressing containment relations. In addition, when describing the spatial relations by support relation, the processing time of CLE should be shorter than when describing the spatial relations by containment relation.

The article consists of four main sections. It begins with an overview of how static spatial relations are expressed in Estonian and Chinese. Next, the data and the method that was used to gather it are described. Section three describes the data analysis. Finally, there is a discussion section on the possible reasons for the results and how they could be implemented while teaching.

2. Overview of expressing static spatial relations in Estonian and Chinese from the typological perspective

Bowerman and Choi (2001) have created a gradient of support and containment relations, the two most fundamental spatial concepts. According to them, many languages express situations of containment, support, encirclement, attachment, adhesion, piercing, hanging and so on by using most often two, but sometimes also one or three terms. In most languages there is one term for containment and one term for support, dividing the rest of the abovementioned situations also into those two categories. The so-called IN-ON gradient (Figure 1) covers situations from more prototypical support situations to more prototypical containment situations.

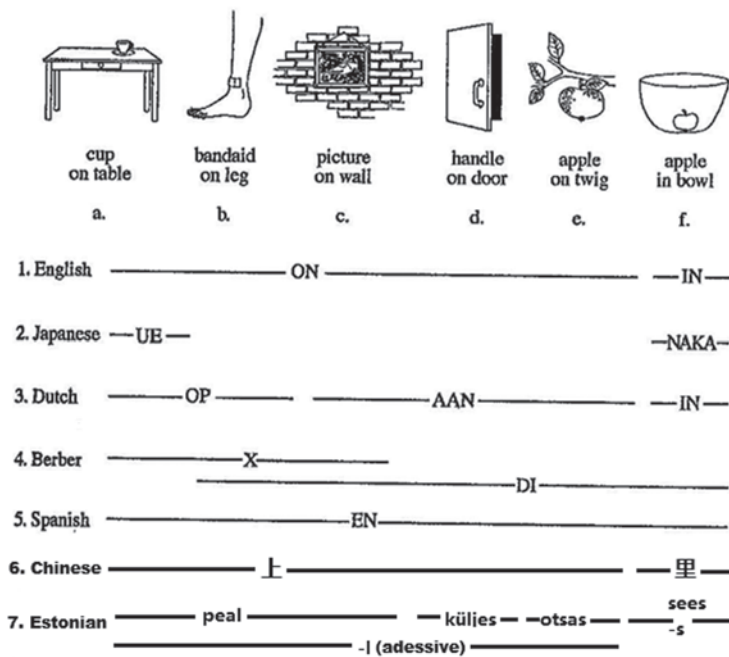


Figure 1. IN-ON gradient (Bowerman, Choi 2001), with the addition of Chinese and Estonian according to Bleive 2022

Estonian uses mostly the inessive case and the postposition *sees* ‘in’ for static containment relations and the adessive case and the postpositions *peal* ‘on’, *küljes* ‘attached to’ and *otsas* ‘attached to the tip/top, at the tip/top’ for static support relations. In Chinese there is mostly the postposition (or location marker) 里 *li* ‘in’ and the location noun (or location marker) 里面 *lǐmian* ‘in, inside’ and sometimes also the postpositions 中 *zhōng* ‘in, in the middle of’ and 内 *nèi* ‘in’ for containment relations and the postposition 上 *shang* ‘on’ and location nouns 上面 *shàngmian* ‘on, above’, 上边 *shàngbian* ‘on, above’ and 上方 *shàngfang* ‘on, above’ for support relations.

In order to better understand the similarities and differences in expressing spatial relations in Chinese and Estonian, a pilot study (Bleive 2022) was conducted with 10 Estonian native speakers (abbreviated as ENS throughout the rest of the article) and 5 Chinese native speakers (abbreviated as CNS throughout the rest of the article) who didn't participate in the main study. They described the pictures of the topological relations picture series of Bowerman and Pederson (1992) in their native language. The CNS had some knowledge of Estonian (on various levels from being fluent to being a beginner). Accordingly, they were also asked to describe the pictures in Estonian, so that later I could map the spatial relations most difficult to describe for CNS. This was useful in choosing the pictures for the main study. In addition I used the research of Zhang (2013) on the usage of English spatial

¹ The difference here is irrelevant. In this article I have decided to use the term postposition in order to be able to compare the situation better to Estonian, but actually there is a lot of discussion going on regarding this topic (e.g. Paul 2014: 93–137, Djamouri et al. 2011, McCawley 1991).

language by CNS – also based on the picture series of Bowerman and Pederson (1992) – in order to have a bigger basis of comparison for comparing the answers of CNS and ENS.

As Bleive (2022) stated in his article on expressing static spatial relations in Estonian and Chinese, there are many similarities in how Estonian and Chinese divide the gradient. On the one hand, speakers of both languages made similar distinctions between situations of containment and support. On the other hand, the CNS tended to describe most of the situations in Chinese with terms of support (50 pictures) and only a handful of very prototypical containment situations with terms of containment (10 pictures). By contrast, ENS tended to use the terms of support and containment in Estonian more evenly (33 and 21 pictures, respectively).

One vivid example where the ENS used containment relation and the CLE support relation is the type of spatial relation called “paradoxical figure-ground reversal”. It is rare but not unseen in world languages as there are some varieties of French (Werning 2012) where a similar containment relation as for picture 21 (depicted is a shoe on a foot) in Estonian is possible. Werning (2012: 323) believes that the reason behind this kind of descriptions of spatial relations is:

The cognitive salience of a containment plus the salience of function/control that are present in these configurations, which trigger the choice of the IN preposition accompanied by a cognitive flip of *locatum* and *relatum*.

The same author (Werning 2013: 244) points out two main features that are common for the cases of paradoxical figure-ground reversals:

The ground, often but not always a body part, controls the figure.
The figure encircles or caps the ground; therefore the ground(!) is partially IN the figure(!).

It seems quite probable that those factors are also playing an important role in similar spatial expressions in Estonian.

According to another study (Moltaji 2016), a similar paradoxical figure-ground reversal is also possible in Persian: *Kafš tuye pāe* – shoe IN feet ‘The shoe is on her feet’ (Moltaji 2016: 26). The same is possible also in French: *La chaussure est au pied* – the shoe is ATTACHED the foot ‘The shoe is on the foot’ (Werning 2013: 240), which is the same in Estonian: *King on jala-s* – shoe is foot/leg-INESSIVE ‘The shoe is on the foot’.

Or another example from Italian, which uses the containment relation in the same way as Estonian does with picture 5: *Il cappello è in testa* – the hat is IN head, ‘The hat is on the head’ (Werning 2013: 240); *Müts on pea-s* (Estonian) – hat is head-INESSIVE ‘The hat is on the head’.

Or similar to the description of picture 10 in Estonian, in Italian, *L’anello è infilato nel dito* – the ring is threaded IN the finger ‘The ring has been stuck on the finger’ (Werning 2013: 243); in Persian, *angoštar tuye angošte* – ring IN finger ‘The ring is on the finger’ (Moltaji 2016: 27); and, finally, in Estonian: *Sõrmus on sõrme-s* – ring is finger-INESSIVE ‘The ring is on the finger’. Werning states that in Ancient Egyptian and Akkadian, similar kinds of usages were also normal (2013: 240–243).

There was one more major difference between the language usage of the ENS and CNS: the way they broke down the types of situations described through a support relation. The CNS mainly used the postposition 上 *shang* ‘on’ to describe support situations, as well as the related location noun 上面 *shàngmian* ‘on, above’. The ENS tended to make more distinctions by using postpositions like *peal* ‘on’, *küljes* ‘attached to’, *otsas* ‘attached to the tip/top, at the tip/top’ or the adessive. All those Estonian location markers express a support relation, but each of them emphasizes a different aspect of it. Thus the ENS had the option of using more precise ways of describing situations through a support relation by using the postpositions *peal*, *küljes* or *otsas* or the more general way of using the adessive for describing the same situations. So it turns out that for Estonian speakers, the situations of attachment and attachment to the top/tip of something are subdivisions of the support situation. For CNS nothing like this was observed; there were no subdivisions for either the support situations or the containment situations, making the division more clear-cut. (Bleive 2022)

In my earlier article on expressing static spatial relations in Chinese and Estonian (Bleive 2022), I proposed that the containment relation (picture f in Figure 1) should actually be at the beginning of the IN-ON gradient, as the most stereotypical containment relation in its core actually contains a support situation (Kolstad 1991, referred through Mandler 1992). As pointed out by Kutscher (2011), there are some languages, such as Ardeşen-Laz, which do not fit onto Bowerman and Choi’s IN-ON gradient. In Ardeşen-Laz the spatial term for the situations where the apple is in the bowl (picture f in Figure 1) and where the cup is on the table (picture a) is the same. The contradiction arises because the idea of the IN-ON gradient is that there are no languages where there are spatial terms for situations on the gradient in a way that they are not adjacent on the gradient. When modifying the gradient in a way that the containment situation (picture f) is at the beginning of the gradient, this contradiction of Laz data would disappear, as the pictures a and f would be adjacent to each other.

3. Method and data

3.1. Data collection: picture describing task

In order to create the questionnaire, the LimeSurvey online survey tool was used². The questionnaire was conducted in May 2021. The respondents saw 39 pictures that were chosen according to the results of the pilot study (Bleive 2022) from the 71 pictures of the topological relations picture series created by Bowerman and Pederson (1992). The 39 more difficult pictures were chosen. For every picture there was a question, *Where is...* (name of the object)?

The respondents had to describe the position of one object, shown in orange (*locatum*, figure) and determine the way in which another object, shown in black (*relatum*, ground), was related to the orange object. In order to minimize the variation of different objects and to avoid the situation where the respondent does not describe the picture simply because s/he is not able to name the *relatum*, I added

² <https://survey.ut.ee>

to every picture the genitive form (of which it is possible to create other locative forms) of the *relatum*. The *locatum* was already mentioned in the question above the picture. In this way, the respondents could concentrate only on the usage of the locative cases or adpositions in their answers without any other disturbing factors. An example of how the respondents saw the question and picture is given as a screenshot from the survey in figure 2.

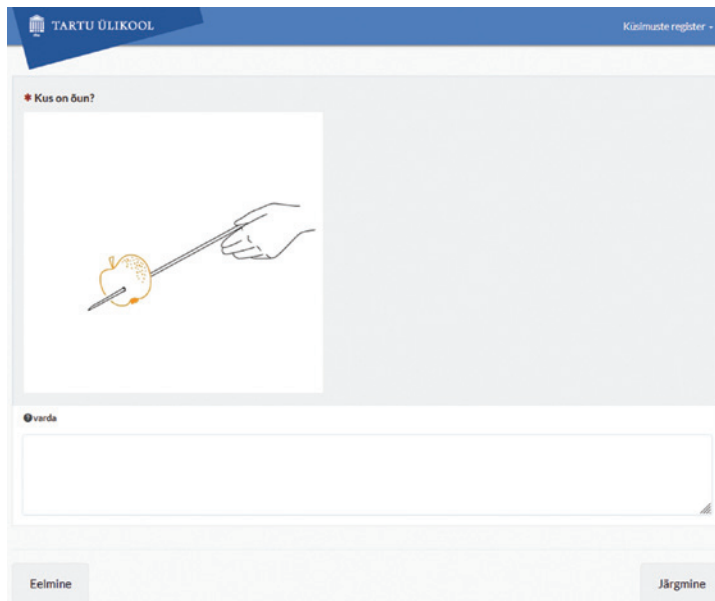


Figure 2. Example of a question from the survey

In order to minimize the risk of misunderstanding the experimental task, I presented the respondents with the instructions for the experiment in Chinese³. The respondents answered the questionnaire in writing through LimeSurvey. To measure the reaction time, I saved the time each respondent had spent on every page. There was one picture and one question visible per page at a time, and to proceed to another question the respondents had to move to another page by clicking ‘next’.

To analyze the gathered data, I compared the results to the pilot study and conducted a statistical analysis using the statistical software R (version 4.1.1), packages *lme4*, *multcomp*, *lmerTest* (R Core Team 2021).

3.2. Participants

Altogether 22 respondents completed the questionnaire. The respondents were 18–21 years old. There were two different groups. In one group there were 15 respondents, who were 18–19 years old; in the other group there were seven respondents, who were 20–21 years old. At the moment of answering the survey, the respondents of the first group had been learning Estonian intensively (around 10 hours per week) for three years only in the classroom environment. Respondents

10 ³ Instructions in the original and the English translation: 请在参照物（即图中非黄色部分）的单词后添加表示位置的格或词。提示：图片下方的蓝色单词为参照物单词的属格形式。Please add a case suffix or a word expressing location after the word indicating the reference object (that is the part of the drawing that is not yellow). Hint: the blue word below the picture is the genitive form of the word that indicates the reference object!

of the second group had been studying Estonian for five years, three of which were spent in a classroom environment (around 10 hours per week) and two in a natural language environment in Estonia. I deemed it not necessary to gather information about their language proficiency level, as I had been teaching both groups for one year in Beijing. Theoretically both groups should have reached at least B1 level, but in practice, the proficiency levels were quite non-uniform depending on the individual's personal motivation. Both groups had learnt Estonian for the first two years by using the textbook "E nagu Eesti" (Pesti, Ahi 2015). After that, textbooks like "Keel selgeks!" (Rammo et al. 2012) and "Naljaga pooleks" (Kitsnik, Kingisepp 2006) were used. All the respondents had started their studies of Estonian in China at the Beijing International Studies University (BISU). The first group answered the questionnaire during their Estonian class, although they were not actually together but rather in their homes since they participated in the Estonian class via Zoom. I was available for them on-line via Zoom while they answered the questionnaire. The second group answered the questionnaire at different times, when it was most suitable for them. The gender distribution among the respondents was unequal: there were two male respondents and 20 female respondents. The native language of all respondents was Chinese and the first foreign language was English.

3.3. Data

After conducting the questionnaire I had 39 answers from 22 respondents, the response rate being 100%. As I allowed multiple responses, the respondents also had the possibility to add more than one answer, but this option was used very rarely, only seven times. That is why there are 865 responses rather than 858.

In order to analyze the data, qualitative analysis and statistical analysis (including mixed effects logistic regression and mixed effects linear regression) were used. In statistical models, only pictures (25 out of 39) with support or containment as the predominant spatial relation in Estonian answers of the ENS were used. All the pictures where other spatial relations were mainly used were not included in the statistical models.

4. Results

4.1. Categories of difficult spatial relations for CLE

The answers were divided into three groups according to the type of spatial relation: containment, support and other kinds of spatial relations. Of all Estonian answers of the CLE, there were 379 answers (43.8%) using support relations, 201 answers (23.2%) using containment relations, and 285 answers (33%) using other kinds of relations. Of all Estonian answers (altogether 447) of the ENS, there were 193 answers (43.2%) using support relations, 128 answers (28.6%) using containment relations and 126 answers (28.2%) using other kinds of relations. This is shown in Table 1.

Table 1. Answers according to types of spatial relation

Answers	Support relations	Containment relations	Other kinds of relations
CLE	379 (43.8%)	201 (23.2%)	285 (33%)
ENS	193 (43.2)	128 (28.6%)	126 (28.2%)

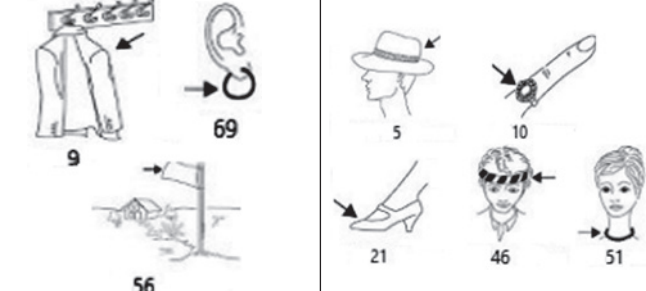
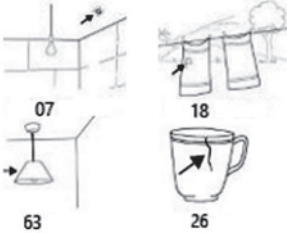
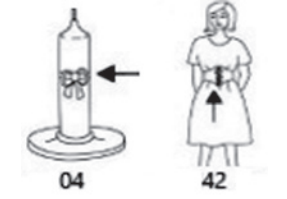
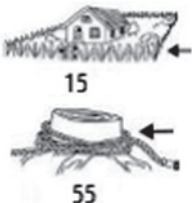


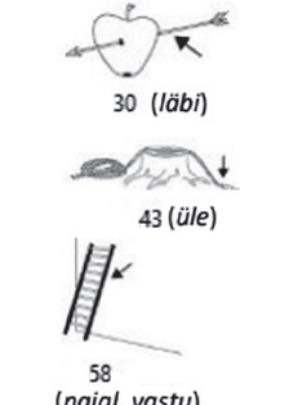

Out of the 39 pictures, 11 were mostly described in a native-like way (the type of spatial relation and the predominately used locative case suffix or adposition coincided with the usage of native speakers). 28 pictures were described in a non-native-like way (the type of spatial relation and the predominately used locative case suffixes or adpositions did not coincide with the usage of native speakers).

There are four main categories of pictures (see Table 2) where CLE systematically tended to have difficulties with following the native-like logic. The first two categories (see category no. 1 and 2 in Table 2) are similar in that there is difficulty with using adpositions that describe support relations, but not in their prototypical horizontal way. They describe support relations where the supporting ground is either vertical (or some other non-horizontal direction) or only a small part of the supporting object is actually in contact with the object that is being supported. These adpositions were *otsas* ‘attached to the tip/top, at the tip/top’ and *küljes* ‘attached to’.

In addition to that, there are three smaller categories (see category no. 5, 6, 7) where the CLE occasionally had difficulties. Those categories were the use of *ümbër* ‘around’ (no. 5), using internal locative cases instead of (logical) external locative cases (no. 6) and, finally, a mixed category of some less frequent adpositions (no. 7).

Table 2. Main categories of difficult static spatial relations for CLE

Category of difficult types of static spatial relation expression	Pictures described in a non-native-like way	Pictures described in a native-like way
1 <i>otsas</i>		
2 <i>küljes</i>		

<p>3 Figure and ground reversal</p>		
<p>4 Flat surface containment</p>		
<p>5 ümber</p>		
<p>6 Internal locative cases instead of external locative cases</p>		
<p>7 Usage of other adpositions</p>		

Among the ENS there were many pictures where *küljes* and *otsas* dominated (so that 50% or more answers were with those postpositions). Among the CLE there were no pictures where *küljes* or *otsas* dominated. Thus, it can be concluded that most of the CLE did not use those postpositions in a native-like way. The majority used the adessive (for pictures 20, 27, 33, 41, 61, 65, 66, 70) instead. It is interesting that, of the four participants who used *küljes/külge*, three preferred to use the dynamic allative/illative variant *külge*. Only one participant used both postpositions *otsas* and *küljes* at least once. In the answers of ENS there was some variation in describing those pictures, mainly meaning that adessive and in one picture (22) inessive case was used by some respondents (a clear minority).

Two other categories of pictures (see no. 3 and 4 in Table 2) are both described to some degree counter-intuitively by the ENS. The first of those two categories (no. 3) mainly contains pictures with clothing elements and jewelry (pictures 5, 9, 10, 21, 56, 69). In this category the aforementioned paradoxical figure-ground reversal is used. Unlike the previous two categories, there were also some pictures (for example 46, 51) that did not pose any difficulties for most respondents.

The way of describing the spatial relations depicted in the pictures of the fourth category (see no. 4 in Table 2) is less counter-intuitive. This category contains pictures (7, 18, 26, 63) where, in Estonian, flat surfaces and objects on them are not described as support relations but, like in Chinese, as containment relations. In this category, as in the first two categories, there were no pictures that did not pose any difficulties to CLE.

Additionally, there was one category (see category no. 5 in Table 2) that was divided evenly into two subcategories, one in which the CLE had no difficulties following the native-like logic and the other one where they did. The ENS described all the pictures belonging to this category by using the adposition *ümber* ‘around’. Meanwhile, the CLE tended to use *ümber* in a native-like way only when they described the picture as a loose-fitting relation. In Chinese, there is a postposition 周围 *zhōuwéi* ‘around’ for cases where the *locatum* does not touch the *relatum*, a situation that some researchers call loose-fitting relation in contrast to tight-fitting relation (Norbury et al. 2008). The postposition 周围 *zhōuwéi* is not used when there is a tight-fitting relation. The CLE tended to use the adessive to describe the pictures with tight-fitting relation, clearly following the Chinese logic that uses the postposition 上 *shang* ‘on’ to describe those pictures as support relations.

The CLE had difficulties with some other Estonian adpositions also, but those adpositions did not form a uniform group (see category no. 7 in Table 2). There were just some sporadic individual pictures that were difficult. For example, picture 30 was difficult because of the usage of the adposition *läbi* ‘through’, an adposition that does not have any equivalent in Chinese. The usage of only a verb is common in Chinese to describe picture 30, as the situations where a figure is impaled by a ground are at the top of the hierarchy of basic locative constructions (a construction that is used in response to a question “where is the X”) according to Levinson and Wilkins (2006: 16). This makes the likelihood of using other constructions instead of a basic locative construction very high. So it is easy to understand that if the Chinese description of the same picture either uses the adposition 中 *zhōng* ‘in the middle, in’ or uses only a verb 穿过苹果/插着苹果 *chuānguò píngguǒ/chāzhe píngguǒ* ‘penetrating an apple/piercing an apple’ without any adposition or location word, then the CLE tried to describe the picture in Estonian in a similar way

as in Chinese. This was done by using the inessive (*õun on vardas* ‘the apple is in a stick’) or a verb that describes the situation (*õun läbistas nool* ‘the apple was penetrated by an arrow’).

4.2. Findings revealed by the statistical analysis

1) The possible correlations between the answers where there was the same type of spatial relation used both by the CLE and ENS and the types of spatial relation in Estonian (containment or support) were examined with mixed effects logistic regression⁴. The model revealed that there was a statistically significant (p-value 0.0227) difference between the types of spatial relations (containment or support) used by the CLE when describing the situations in Estonian and the types of spatial relations used by the ENS. In those cases where the CLE described the spatial relation as support, there was a greater probability of the CLE using native-like logic for choosing the type of spatial relation to describe the situation.

2) The possible correlations between the case and adposition usage in the answers of the CLE and ENS were examined with mixed effects logistic regression⁵. The model revealed that if the CLE used case suffixes in their Estonian answers, then the type of spatial relation in their answers was more likely to coincide with the answers of the ENS. On the other hand, however, if the CLE used adpositions in their Estonian answers, then the type of spatial relation was less likely to coincide with the answers of the ENS. For a brief summary, see Table 3.

Table 3. Summary of native-like and non-native-like usage of postpositions and case suffixes by the CLE

Native-like case usage	Native-like adposition usage	Non-native-like case usage	Non-native-like adposition usage
250/545	62/545	134/545	99/545
45.9%	11.4%	24.6%	18.1%

In 250 cases (45.9%) out of 545 answers (all the answers that were analyzed), the CLE used case suffixes to describe spatial relations in the pictures and at the same time the type of spatial relation was the same in the Estonian answers of the CLE and the ENS. By contrast, if the CLE had used adpositions to describe the spatial relation in their Estonian answers, then the type of spatial relation coincided only in 62 cases out of 545 answers (11.4%). There were 134 cases out of 545 answers (24.6%) where the CLE used case suffixes, but the type of spatial relation did not coincide with the spatial relation used by the ENS. In addition, there were 99 cases out of 545 answers (18.1%) where adpositions were used and the type of spatial relation used by the CLE coincided with the answers of the ENS. For a brief summary, see Table 3.

⁴ `mlog.glmer <- glmer(Hiinlaste.vastustes.ja.eesti.vastes.sama.kohasuhte.liik ~ Lihtsustatud.kohasuhte.liik.eesti. keeles + (1|Vastaja.ID) + (1|Pildi.ID), data = andmed, family = "binomial", control = glmerControl(optimizer="bobyqa"))`
Variables in English: answers where there was the same type of spatial relation used both by the CLE and ENS ~ the type of spatial relation in Estonian + respondent's ID + picture's ID.

⁵ `mlog.glmer2 <- glmer(Hiinlaste.vastustes.ja.eesti.vastes.sama.kohasuhte.liik ~ Lihtsustatud.kohasuhte.liik.eesti. keeles + Käändelõpp.0.või.kaassõna.1.emakeelsete.vastustes + Käändelõpp.0.või.kaassõna.1.hiinlaste.vastustes + (1|Vastaja.ID) + (1|Pildi.ID), data = andmed, family = "binomial", control = glmerControl(optimizer="bobyqa"))`
Variables in English: the same type of spatial relation used both by the CLE and ENS ~ the type of spatial relation in Estonian + the usage of case suffixes or adpositions in the answers of the ENS + the usage of case suffixes or adpositions in the answers of the CLE + respondent's ID + picture's ID.

In general, it turns out that the CLE overused the locative cases as they tended to use case suffixes much more often in their Estonian answers (in 384 cases out of 545, 70.5%) than adpositions (only in 161 cases out of 545, 29.5%). The ratio of native-like and non-native-like answers was almost two to one (more precisely, there were 1.87 native-like answers to every non-native-like answer). In contrast, when adpositions were used the ratio was almost the opposite: in 62 cases, the usage was native-like and in 99 cases the usage was non-native-like – the ratio thus being 0.63 native-like answers for every non-native-like answer.

3) The possible correlation between response time and the answers where the CLE used the same type of spatial relation as the ENS was examined with mixed effects linear regression⁶. The model revealed that there was a correlation between response time and the overlap of the type of spatial relation in Chinese and Estonian. Specifically, if the type of spatial relation was not the same in both languages, the reaction time was shorter. In contrast, if the type of spatial relation was the same in both languages, then the reaction time was longer.

4.3. Differences in adposition usage between the CLE and ENS

The CLE did not use most of the adpositions with the same frequency as the ENS. The adpositions *küljes* ‘attached to’ and *otsas* ‘attached to the tip/top, at the tip/top’, which do not have equivalents in Chinese, were the two adpositions used with the most different frequencies by the ENS and CLE. In both cases, the difference between the two groups was around 10% (see Figure 3). The next adpositions with the biggest differences in the percentage of usage were *ümber* ‘around’ (around 8% difference), *peal* ‘on’, *sees* ‘in’, *kohal* ‘above’ and *üle* ‘over’ (all had a difference of around 2%), all of which have partial equivalents in Chinese. Although they colexify different senses (see François 2008) in Estonian and Chinese, they share at least some senses. The postposition *peal* is exceptional as it was the only adposition used more by the CLE than by the ENS. All other adpositions were used more by the ENS. The following chart (Figure 3) depicts the percentages of usage of the most differently used spatial adpositions in all answers of the ENS and CLE (including those where only case endings were used). They are sorted according to the differences in the percentage of usage. The bigger the difference in the height of the columns, the bigger the difference in the percentage of usage. Other adpositions used by respondents – *kõrval* ‘next to’, *ees* ‘in front of’, *ääres* ‘beside’, *lähedal* ‘near’, *najal* ‘leaning against’, *all* ‘under’, *vastas* ‘facing’, *vastu* ‘against’, *taga* ‘behind’, *tipus* ‘at the tip of’, *keskel* ‘in the middle of’ and *juures* ‘at, near to’ – were not used with significantly different frequencies. They were therefore not added to the chart. See Figure 3 for more details.

16 ⁶ `m1in.lmer <- lmer(Vastamiskiirus ~ Hiina.vaste.kohasuhte.liik.sama.mis.eesti.keeles + (1|Vastaja.ID) + (1|Pildi.ID), data = andmed)` Variables in English: response time ~ the answers where the CLE had the same type of spatial relation as the ENS in their answers + respondent's ID + picture's ID.

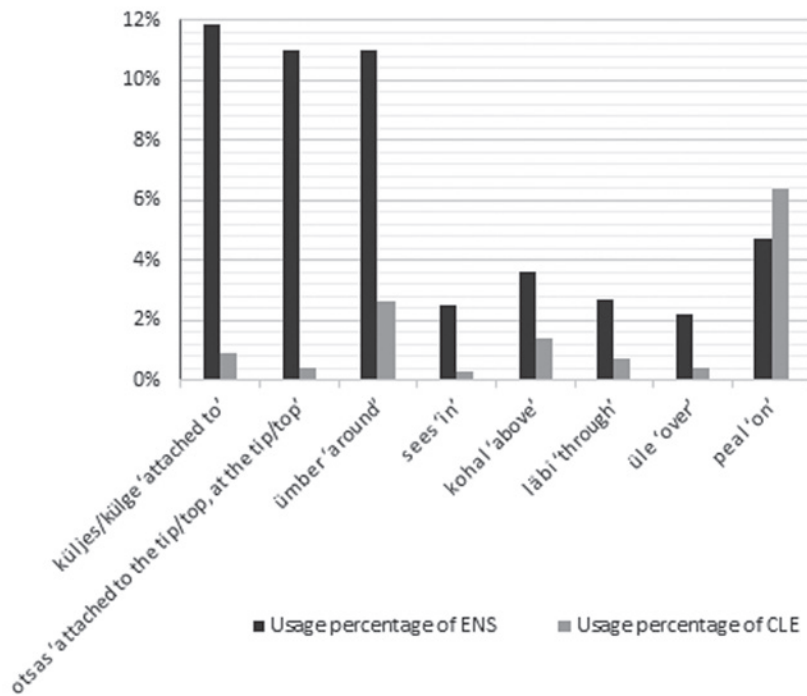


Figure 3. Percentages of most used locative adpositions in all answers of the ENS and CLE

It is interesting to note that there were no big differences in usage rates of the adpositions from the chart above between the two groups who participated in the study. The only adpositions that were used with considerably different usage rates were the postposition *küljes/külge*, which was used 15 times by the advanced group (7 members) and only twice by the less advanced group (15 members) and the ambiposition *üle* which was used 5 times by the advanced group and once by the less advanced group.

Not a single participant used all of the 6 adpositions in the chart (excluding postpositions *peal* and *sees*, because the adessive and inessive are in parallel use with them). There was one participant who used five out of six, two who used four out of six, and two who used three out of six. This indicates that there wasn't a single group of more advanced participants who were able to use more different adpositions, rather different participants tended to use different adpositions.

5. Discussion

There were three main results of the statistical analysis. Below I will discuss the possible causes for these results: I'm trying to find reasons why the adessive was used in a more native-like way than the inessive or any kind of adpositions, and why describing pictures as support relations required more time. Understanding the reasons for this helps to understand how the CLE are influenced by their native language in learning how to express static spatial relations in Estonian.

1) With regards to the first result, the question is, why did the type of spatial relation in the Estonian answers of the CLE coincide with greater probability with the answers of the ENS if the type of spatial relation in the answers of the ENS was support?

This seems to be quite expected, as my earlier article (Bleive 2022) states that CNS tended to describe most of the pictures of Bowerman and Pederson's topological relations picture series as support relations using mainly the Chinese postposition 上 *shang* 'on' or the location noun 上面 *shàngmian* 'on, above'. As it is so prevalent to describe spatial relations through support in Chinese, it is to be expected that the CLE tend also to use the same strategy when describing the same relations in Estonian. Out of 865 answers they gave 379 answers where the pictures were described through a support relation in contrast to 201 answers where the pictures were described through a containment relation. There were also more pictures where the ENS used a support relation (193 support relations against 128 containment relations, out of 447 answers). Hence it can be expected that when overusing a support relation to describe the pictures in Estonian, the Chinese respondents were more likely to describe the pictures through the same type of spatial relation as the Estonian respondents.

The CLE had difficulties with mainly two groups of pictures. In the first group, there are pictures that were described by the ENS by using the adposition *küljes* 'attached to' (first subgroup) or by using the adposition *otsas* 'attached to the tip/top, at the tip/top' (second subgroup). The CLE tended to use the adessive instead of these adpositions when describing those pictures. But as the adessive expresses the support relation in the same way as the postpositions *küljes* and *otsas* do, the type of spatial relation is still native-like even though the usage of the adessive is not. In contrast, in the second group the CLE did not use the inessive in the same way as the ENS did and again used the adessive instead. In this group there are two subgroups: in the first one there are the pictures that use paradoxical figure-ground reversal to describe a situation, like *müts on peas* (literally 'the hat is in the head'), and in the other one, objects on a surface are described through containment, such as *ämblik on laes* (literally, 'the spider is in the ceiling'). So, the result was that not only did the CLE not choose the native-like case suffix, but they also did not choose the type of spatial relation in a native-like way, so instead of using a containment relation they described those pictures with a support relation. This confirms the result that the CLE are more likely to use the spatial relation in a native-like way if the ENS describes the picture through a support relation.

2) With respect to the second main result, the question is, why was the usage of adpositions by the CLE less native-like than the usage of case suffixes?

If the CLE used adpositions in their Estonian answers, then the type of spatial relation was less likely to coincide with the type of spatial relation used by the ENS. On the one hand, during classroom teaching, there was more emphasis on teaching of the usage of cases, including locative cases, giving the impression that in Estonian the main way to express spatial relations is by using locative cases and less by using locative adpositions. This explanation seems probable if one takes a look at the textbook that was used by both groups of respondents for the first two years ("E nagu Eesti" by Pesti and Ahi 2015) and other textbooks used by them ("Keel selgeks!" by Rammo et al. 2012 and "Naljaga pooleks" by Kitsnik and Kingisepp 2006). Only one

of those textbooks mentions the postposition *küljes* ‘attached to’ and none of them mentions *otsas* ‘attached to the tip/top, at the tip/top’ in its postpositional use. In addition, according to the vocabulary proficiency level search that can be found among the Estonian as a second language teacher tools (Kallas et al. 2021) such frequently used adpositions as *küljes* ‘attached to’, *otsas* ‘attached to the tip/top, at the tip/top’ and *ääres* ‘by the side of’ should be learned only at the B1 language proficiency level. All this indicates that starting to add adpositions like *otsas* and *küljes* into textbooks at lower levels could have a great impact on making the CLE (and Estonian learners with other native languages as well) more acquainted with them. Of course, as exact data about the contact with Estonian outside the classroom context was not gathered, there is always a possibility that other factors could be influential as well. For example, as there was not a big difference in adposition usage of more and less advanced groups, it is possible that the only differences in usage of *küljes* and *üle* could be explained by more intense language contact of those few participants who used them in their answers.

On the other hand, the reason can also be that even if in the perception of the CLE the character 上 *shang/shàng* (only the unstressed pronunciation of the character 上 is a postposition with the meaning ‘on’) has a similar meaning to the postposition *peal* ‘on, on top of’, it is also used to denote more abstract meanings. In general its usage is wider. It might seem intuitively logical to connect the functions and meanings of those two postpositions so that one could assume the use of the postposition *peal* by CLE in those places where in Chinese the postposition 上 *shang* is used. The reason why it is not so could be that the first functions of the character 上 were according to Jin (2021) as a noun meaning ‘something or somebody who is located in a high place’, as an adjective with the meaning ‘upper, higher, better, superior’, or as a verb with the meaning ‘to move to a higher place’. The function of postposition appeared only in the stage of Early Medieval Chinese (Jin 2021). This could explain why the CLE do not use the Estonian postposition *peal* by analogy to the Chinese postposition 上 *shang*, even though those two postpositions have many similarities in their usages and one could assume overuse of *peal* by the CLE.

3) With regard to the third result, the question that arises is, why was the response time of the Estonian answers of the CLE slower if the type of spatial relation in Estonian and Chinese is the same compared to the cases where the type of spatial relation in Estonian and Chinese is not the same? At first glance this might seem counter-intuitive, because when one’s native language acts in some respect in the same way as the second language acquired by the same person, then it seems reasonable to assume that it is easier and faster to produce those structures in the second language as well.

The reverse situation can also have various explanations. For example, Finnish and Estonian native speakers mainly perceive similarities when learning Finnish or Estonian, but Russian native speakers mainly perceive differences when learning the same languages (Kaivapalu, Martin 2015). Unlike Russian, Finnish and Estonian are two closely related cognate languages. Hence it makes sense that once one knows that there are few similarities between one’s native language and the target language, then it is not reasonable to assume that one can make a lot of use of analogy between his or her native language and the target language. But once it is obvious that the native language and the target language are similar, it makes

sense to make use of analogy between those languages. In this way, learning many new structures and morphemes can be avoided and thus the learning process can be vastly accelerated, at least in the first phases of language acquisition. This is exemplified by Håkan Ringbom (1987) and his analogy of a football player and a tennis player trying to learn how to play squash. I assume that as Chinese and Estonian are even more different languages than Russian and Estonian, then the same kind of difference as between Russian students and Finnish students learning Estonian applies to Chinese and Finnish students learning Estonian. As there is zero relation (Ringbom 2007: 5) between the spatial language forms of Estonian and Chinese, the contrast could be possibly even more accentuated. If we consider that once two languages are different the learners start to perceive more differences, it could also explain why the reaction times are slower for the pictures where the spatial relation in Estonian and Chinese is the same. This might be so because even if in those cases where the difference is lacking they are perceiving mainly differences, it is more difficult for them to process the similarity, because it is contrary to what they expected. The consciousness about the dissimilarity of the two languages produces the situation that Kaivapalu (2017: 259) describes: the L2 learners grow suspicious because it seems too similar to be true.

There is also evidence that similarity does not necessarily help to process semantically similar words faster from another study that researched Japanese-English bilingual processing (Allen and Conklin 2013). It showed that in the case of increased phonological similarity, the response times were shorter, whereas if there was increased semantic similarity the response times were longer in the lexical decision task.

In conclusion, even if the CLE overused the external locative cases, they still used them in the most native-like way, but at the same time they needed more time for processing while giving this kind of answers. This is an interesting result as it goes against the hypothesis of this research that one could expect more and faster usage of postpositions as it is similar to Chinese. But as discussed above, one can find logical reasons why the situation is not exactly as expected.

6. Conclusion

As the answer to the main research questions of this article, it can be concluded that the CLE do not have difficulties distinguishing support and containment relations in Estonian, as this distinction exists in both languages with respective linguistic markers to express it. However, it must be noted that there are some differences that make the Estonian system of expressing static spatial relations difficult to acquire for the CLE. The main difficulty for learners lies in the fact that in Estonian the border between situations that are seen as support or containment in many cases does not coincide with the same border in Chinese.

The fact that the CLE tended to overuse support relations in their Estonian descriptions in comparison to the ENS is in accord with the first part of the initial hypothesis, which stated that the dominance of support relations in Chinese influences the CLE to overuse support relations in their Estonian descriptions. The dominance of using the postposition 上 *shang* 'on' in Chinese to describe most of

the static spatial relations did not influence the CLE to overuse postpositions in their Estonian descriptions. This is contrary to the second part of the hypothesis, which stated that the usage of postpositions and the lack of any kind of distinction between different kinds of support relations in Chinese should influence the CLE so that the usage of postposition *peal* ‘on’ is prevailing. Instead, the CLE tended to overuse the adessive. The only postposition that they slightly overused was *peal*, so this part of the hypothesis matched to some degree with the reality. As supposed by the hypothesis, the CLE were unable to differentiate between different kinds of support relations in Estonian (such as attachment by using *küljes* and attachment to the top by using *otsas*). They tended to use simple support relations expressed by the adessive instead.

On the one hand, the dominance of support relations in Chinese influenced the CLE so that they tended to overuse support relations in their Estonian descriptions. On the other hand, it did not influence the CLE so that they needed less time to produce Estonian descriptions with support relations. This was contrary to the third part of the hypothesis, which stated that when describing spatial relations by support relations the processing time should be shorter than when describing spatial relations by containment relations.

For further research, the question remains whether it is only difficult to learn how to express those precise distinctions in support relations or whether it is also difficult to understand them. The usage of some adpositions like *ümber* ‘around’, *läbi* ‘through’, *üle* ‘over’ and *kohal* ‘above’ that do not position themselves on the IN-ON gradient was also somehow difficult for the CLE as their native language lacks equivalents for those adpositions. The postposition *najal* ‘leaning against’ is a special case as it is a postposition expressing a support relation and it was not used by the CLE at all, but it was rarely used by ENS as well. Apart from that, it is also important to discuss in more depth the possible practical implementations of the study based on the data gathered.

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KUIDAS HIINA EMAKEELEGA ÕPPURID VÄLJENDAVID EESTI KEELE STAATILISI KOHASUHTEID?

Agu Bleive

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Artikli eesmärk oli uurida, kuidas hiina ja eesti keele vahelised erinevused staatiliste kohasuhete kirjeldamisel mõjutavad hiina emakeelega õppurite staatiliste kohasuhete väljendamist eesti keeles. Eeldati, et hiina emakeelega eesti keele õppurite eesti keele kohasõnade ja -käänete kasutust mõjutab see, et 1) hiina keeles on domineeriv kohasuhete väljendamine toetamissuhte kaudu ning kohasuhteid väljendatakse postpositsioonidega; 2) hiina keeles väljendatakse eri tüüpi toetamissuhteid samade väljendusvahenditega. Hüpoteesi kontrollimiseks vajalike andmete kogumiseks kasutati pildi kirjeldamise ülesannet, mille käigus 22 hiina emakeelega eesti keele õppurit kirjeldasid Bowermani ja Pedersoni (1992) staatiliste kohasuhete pildiseeria 39 pilti.

Esiteks eeldati, et hiina keele mõju väljendub selles, et hiina emakeelega eesti keele õppurid kasutavad eesti keeles kõige rohkem postpositsioone, mis väljendavad lihtsat, ilma täpsema liigendusega, toetamissuhet. Sealjuures peaks kõige rohkem kasutatavaks kaassõnaks olema postpositsioon *peal*, kuna selle hiinakeelset vastet 上 *shang* 'peal, -l' kasutatakse hiina keeles toetamissuhete väljendamiseks väga palju. Andmete analüüsil selgus, et see eeldus peab paika, kuna katseisikud tõepoolest ülekasutasid toetamissuhte väljendusvahendeid (adessiiv, *peal*) staatiliste kohasuhete kirjeldamisel. Samuti puudusid pea täielikult teist tüüpi toetamissuhte väljendusvahendid, nagu postpositsioon *kiiljes* (toetamine kinnitumise kaudu) või postpositsioon *otsas* (toetamine kinnitamise kaudu objekti tipuossa). Postpositsioon *peal* oli tõepoolest kõige rohkem kasutatud kaassõna (kuid mitte kõige rohkem kasutatud kohaväljend).

Teiseks eeldati, et käänded peaksid olema hiina emakeelega eesti keele õppurite poolt pigem alakasutatud, kuna hiina keeles käänded puuduvad. Eriti peaksid alakasutatud olema need käänded, millega väljendatakse seesolemise suhet, kuna hiina keeles väljendatakse seesolemissuhtega väga väheseid kohasuhteid. Sealjuures peaks kohasuhete väljendamine hiina emakeelega eesti keele õppuritel analoogia tõttu hiina keelega võtma vähem aega siis, kui hiina ja eesti keeles on kohasuhete liik sama. See eeldus ei pidanud paika, kuna tegelikult võis täheldada hoopiski käänete (eriti adessiivi) ülekasutust ning pikemat vastamise aega, kui hiina ja eesti keele kohasuhete liik langes kokku.

Võtmesõnad: teise keele omandamine, kohasuhted, kohamarkerid, seesolemine, toetamine, keeletüpoloogia, eesti keel, hiina keel

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