Cognitive Aspects of Acquisition of Prepositions in SLA

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INTRODUCTION AND THEORETICAL BACKGROUND

This paper is intended as an attempt to examine the acquisition of certain prepositions in Second Language Acquisition (SLA). To our knowledge, little work has been done on prepositions in the field of SLA research. This work suggests that there may be another cognitive process which shapes interlanguage (IL) (Selinker 1972, 1981, 1992), and which may account for the choice of certain prepositions by non-native speakers (NNS).

In his "Interlanguage," Selinker (1972) initially proposed a theory which postulates five processes responsible for the way in which an L2 learner constructs his/her linguistic system (interlanguages). The processes are distinct from both his/her native language and the target language. These processes are: native language (NL) transfer, overgeneralization, transfer of training, communicative strategies and learning strategies. The first two processes NL transfer and overgeneralization, can be singled out from the rest on the basis of the kind of input they facilitate. NL transfer (further developed in Rediscovering Interlanguage, 1992) may be held responsible for facilitating input for the IL from the NL system; overgeneralization, on the other hand, uses the target language (TL) system as a source of input. In both cases the learner’s interlingual system inherits features from another linguistic system.
I propose there may be a cognitive process responsible for the choice of prepositions in interlanguages constructed by NNS of English distinct from NL transfer or other processes such as overgeneralization, transfer of training, communicative strategies and learning strategies. This process facilitates transfer between general non-linguistic cognition and the L2 learner’s interlingual system.

First language acquisition research suggests that there is a link between general cognition involving spatial relationships and language. In her research on the relationship between cognitive predispositions and the semantic system of first language learners, Bowerman (1993) has pointed out that children learning a first language are biased in respect to the organization of their semantic space. She provides experimental evidence that children learn to partition the world around them in accordance with the spatial metaphors afforded them by the language they are learning. She shows that, for example, English and Korean children at the age of 20-22 months and older differ in how they conceptualize the space around them and spatial relations between objects in several respects. One of the differences is that Korean children distinguish between such spatial concepts as “tight fit” and “loose fit/no fit”, whereas English speaking children do not. On the other hand, English speaking children distinguish between such concepts as “covering a surface” and “containment” regardless of how well the participating objects fit together. Bowerman claims that starting at a very early age children learn the “cleavages” of their languages that get encoded in a semantic categorization scheme particular to each language.
Lakoff and Johnson’s work on metaphors points in the opposite direction, where a speaker’s general cognitive system finds expression in the language he/she speaks. Lakoff and Johnson (1980) submit that a large number of linguistic expressions in English are based on a set of metaphors. For example, the authors characterize "container metaphors" as follows:

We are physical beings, bounded and set off from the rest of the world by the surface of our skins, and we experience the rest of the world as outside us. Each of us is a container, with a bounding surface and an in-out orientation. We project our own in-out orientation onto other physical objects that are bounded by surfaces. Thus we also view them as containers with an inside and an outside. (29)

Lakoff and Johnson contend that the container metaphor underlies not only expressions that involve concrete objects, such as "out of the room" or "in the woods" but, also, expressions involving abstract concepts. These are just a few examples taken from the list that they provide:

- He is in love.
- We are out of trouble now.
- He fell into depression.

These examples show that the abstract concepts “love”, “trouble”, “depression” are treated as metaphorical containers at the semantic level.

The situation with the cross-influence between general cognition and language for non-native speakers of a language is very different. An adult non-native speaker already has a well established cognitive system which, according to Bowerman, is biased to the
speaker’s native language. It is reasonable to believe then that, according to Lakoff and Johnson, such a well-established cognitive system would have some influence on the new language the speaker is learning. I propose that some of the errors in a NNS’s use of prepositions in positions which denote abstract (non-spatial) relationships between two entities (e.g. "part of a whole" relationship) stem from the NNS’s perception of spatial relationships between concrete objects in the real world. These relationships become mapped onto the IL system via a cognitive process which I will refer to as “Metaphorical Imagery (MI).” Following Bowerman’s research, I need to point out that the NNS’s perception of spatial relations in general can be said to be shaped by their native language. In this sense, the cognitive process I am proposing is akin to NL transfer, except that it does not involve linguistic information from the NL system. The native language participates in the transfer only inasmuch as it has already influenced the speaker’s cognitive system.

Another piece of the puzzle is provided by Kellerman and Eckman. Kellerman(1979) describes an idea that some linguistic items are more prototypical in a language than others. His experiment with Dutch speakers learning English shows that the NNS’s are more comfortable transferring some uses of the word “break” (the ones Kellerman calls prototypical, for example “He broke his leg”) than the more marginal ones such as “Some workers have broken the strike.” Eckman (1977) had collected similar evidence based on phonetic data from English and German speakers and he refers to this phenomena as “markedness.” So, in addition to a NNS’s cognitive system being shaped by the native language, some concepts become more “prototypical”, or “marked.” This implies that the speaker should have a tendency to think not only in terms of how various relationships
are implemented in their native language, but also what relationships are more “core” to the language.

In other words, if a NNS has to express an abstract relationship between two entities he or she may tend to think of the relationship in concrete terms and apply a spatial preposition. For example, in *We have some problems in our English1 the learner is using a spatial preposition “in” instead of “with” (which in this case according to Celce-Murcia and Larsen-Freeman (1983) exemplifies an abstract relationship “in regard to” ). We suggest that the choice of the spatial preposition “in” is determined by the learner’s tendency to make the abstract (intangible) concepts PROBLEM and ENGLISH concrete and also by the tendency to process the relationship between the two as spatial.

I also suggest that there may be a tendency for L2 learners to prefer spatial imagery. The spatial metaphors may be more prototypical or unmarked because they evoke a more vivid mental image in the learner’s mind.2 If one constructs a mental image of a situation that involves abstract concepts, he/she would have to use a metaphorical extension of the objects and relationships in the situation simply because abstract concepts do not have any graphic representation of their own.

Ijaz’s research on lexical acquisition (1986) shows that L2 learners' judgments of the semantic space underlying spatial prepositions in English are different from those of native speakers. She points out that where the typical or central meanings of the spatial

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1 This example comes from The Grammar Book: An ESL/EFL Teacher’s Course by Celce-Murcia, M and Larsen-Freeman (1983) p. 263.
prepositions are concerned the judgments of NS and NNS were similar, which is consistent with Kellerman; the differences arise in the use of spatial prepositions in contexts involving non-central meanings. Ijaz shows that German and Urdu speakers tend to overuse the preposition ON in contexts involving motional, contiguous meaning (expressed by ONTO, UPON) despite the fact that both languages have direct equivalents for prepositions in such contexts. From that she concludes that "the use of ON in these contexts [ONTO, UPON] . . . appears to have been the result of a simplification strategy" (p. 438). The simplification strategy is attributed to Kellerman's idea of prototypicality, according to which the non-central meanings would be less transferable from L1 into L2.

In this study I would like to build on Ijaz’ work and show that learners’ preference for certain spatial prepositions extends beyond the domain of concrete spatial relations and into the domain of abstract concepts. Following Ijaz, I will argue that in acquiring prepositions advanced L2 learners, in addition to "restructuring L1 concepts and defining new semantic boundaries . . . [which] involves permeating and breaking down native language conceptual structures." (p. 405), creatively construct (as opposed to restructure) their cognitive schemas and that this occurs by means of the process of mental imagery. We examine contexts which involve the use of prepositions whose central meaning does not involve spatial relationships and describe the strategies employed by NNS in dealing with such contexts.

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2 This idea has been suggested to me by Elaine Tarone.
THE STUDY

The study was carried out in two phases, the second one being a more focused version of the first.

Phase I

The purpose of this phase was to take a broad sample of subjects with different linguistic backgrounds and, from a practical point of view, to identify a group with similar linguistic background which would give the clearest results in a focused study. Also, I intended to identify problem areas with the instruments (which will be discussed in the appropriate sections) in order to fine-tune the focused study.

Research Questions:

I What strategies do NNS's of English use when they have to choose a preposition in the following contexts:

Type A. NP1 is NP2 of NP3

1. abstract NP referents (e.g. The idea of discrimination was the centerpiece of his augury.)
2. concrete NP referents (e.g. The birdbath is the centerpiece of Joe's lawn)

Type B. NP1 with NP2 (e.g. We have some problems with our English)
II Do NNS's use mental imagery when they have to choose a preposition? In what contexts?

**Experimental Setup**

I Subjects

All subjects of this study are students, faculty or staff of the University of Minnesota, Twin Cities, USA.

For this study two groups were selected:

Group A (NS) - 21 native speakers of English ranging from 15-50 years of age, with the following backgrounds: General College students -2, ESL grad students - 8, secretaries and administrators - 5, linguistics prof. - 3, CLA students - 3.

Group B (NNS) - 29 non-native speakers of English ranging from very low, beginner proficiency to very high native like proficiency. This group is divided into three subgroups:

- Advanced - 11
- Intermediate - 12
- Beginner - 6

The subjects in this group come from the following linguistic backgrounds:

- Japanese - 5
- Vietnamese - 9
- Chinese - 4
- Spanish - 3
II Instruments

For Phase I we used two kinds of instruments:

I. *Cloze Test* which included 14 sentences of the following types:

Type A (7 items) NP1 is NP2 of NP3
   a. abstract referents - 3 items
   b. concrete referents - 4 items

Type B (1 item) NP1 with (in regard to) NP2

Type C (6 items) Distracter sentences

Sentences of Type A included 5 items (one item was not admissible) containing elements which I thought contained vocabulary unfamiliar to both NS and NNS subjects. Each of

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3 In the course of the study sentences 4, 8, 10, and 11 turned out to have design problems which made the data uninterpretable and, therefore, were excluded from the count.
the five sentences contained one unfamiliar noun in the NP1, NP2, and NP3 positions. (The nouns "habilimentry," "augury," "preceptor," "moiety," and "contrivance" were selected from a thesaurus). The idea behind selecting unfamiliar vocabulary items was to test whether unknown contexts have an influence on the NNS's choice of prepositions. The hypothesis was that, faced with an unfamiliar situation, the learners would be forced to use some strategy other than relying on their interlingual competence. An inherent problem with this approach is that it decreases the reliability of the results due to a high probability that the subjects will be simply guessing. However, the verbal reports were helpful in weeding out the unwanted guesses.

As it turned out in the process of administering the tests the design had a number of problems:

a. much of the vocabulary used in the test was not comprehended by the students; the numbers of unfamiliar items surpassed the ones that were used in the test on purpose which made this variable uncontrollable.

b. some of the vocabulary items that were meant to be incomprehensible were, in fact, comprehended by a number of native speakers, which made the results hard to interpret.

c. overall, the test contained too many variables which were not expected. However, apart from making the results difficult to interpret, a wide variety of variables in this pilot study helped to focus the variables in the later study.

II. Verbal Reports.
Verbal reports were conducted with 17 subjects immediately following the Cloze Test. During the interviews I tried to get the subjects to reveal the strategies which they used in choosing prepositions by asking them to remember and describe their thoughts while they were filling out the test. While the subjects were giving answers and explanations I was taking notes. I decided against using any technical equipment to keep the subjects' level of self-consciousness as low as possible.

**Test Procedure**

   Step I. The test was administered to Group A(NS) to establish the frequency of usage of prepositions by native speakers, which would indicate which prepositions are preferred in the given contexts.

   Step II. The test was administered to Group B(NNS) with subsequent interviews.

In the process of administering the test I was using subjects that were most readily available. Therefore, the subjects used in both NS and NNS tests included a high number of English language professionals such as ESL teachers and linguistics professors (7 out of 23 for NNS test and 11 out of 21 for NS test), which affected the results. It should be mentioned, however, that NNS's of native-like proficiency are very difficult to find outside of ESL and Linguistics academic fields.
RESULTS

The analysis of verbal reports shows that the NNS’s responses can be grouped into the following eight categories:

I  Choose what feels natural ("feels right"), relying on one’s IL competence
II Overgeneralization (Analogy) ("saw the phrase used with "in" many times"
   This strategy also includes instances of substitution. e.g. "I used "of" here
   (sentence 6) because I replaced "premise ___ his life" with "highlight of the day" )
III Formula("it is a set expression")
IV Transfer ("that's how I would say it in Russian")
V Mental Imagery ("I used "on" because it is on the lawn" (hands are in motion) or "Society is like a box and students are in that box.").
VI Guess
VII Reconstruction (The NNS attempts to establish the relationship between the referents of the NPs, e.g. "I know what "preceptor" means but it doesn't make sense in this sentence, so it must be something in the house.")
VIII Going by the Rule ("I used "of" because I always use it to combine two NP's, simple modification.")

To answer questions 1 and 2 of this study, the results are summarized in Table A. (For a more detailed table see the Appendix)
Strategies used by NNS's to select prepositions

<table>
<thead>
<tr>
<th></th>
<th>&quot;Feels right&quot;</th>
<th>Overgeneralization</th>
<th>Formula</th>
<th>NL transfer</th>
<th>Mental image</th>
<th>Inference</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL</td>
<td>25</td>
<td>19</td>
<td>3</td>
<td>3</td>
<td>20</td>
<td>31</td>
<td>12</td>
</tr>
</tbody>
</table>

Table A exemplifies the total number of instances of the eight types of responses identified through verbal reports so far.

It should be noted that responses from group VII can be grouped together with group V responses. The responses in group VII stem from situations where the subjects were unfamiliar with one or more NP’s in the test sentence, which often forced them to invent a meaning for the word. Judging by the responses, the subjects invented meanings consistent with the other information available to them from the sentence, namely the other NP that was familiar to them. For example, in the following sentence “NP1 is the cornerstone ___ the house” the subjects would reconstruct the situation relying on the prototypical concept of a house as a container thus placing whatever the referent of NP1 is inside the house. (See Discussion of Verbal Reports for more details) The responses in group VII show that the subjects who gave the responses rely on metaphor similarly to the subjects whose responses are grouped in V.

The numbers in Table A show that NNS subjects’ responses in this test cluster around the following categories: Feels right (22%), Overgeneralization (17%), Mental Imagery (17%) and Reconstruction (27%). The percentages indicate that Mental Imagery plays an
important role in how NNS's deal with prepositions. MI and Reconstruction together comprise 44%, almost half of all strategies used by the subjects, which suggests that metaphor underlying MI and Reconstruction may direct the prepositional choices made by L2 learners.

Also, Mental Imagery was used 14 times out of 68 (20%) in contexts with concrete NP referents and only 4 times out of 51 (8%) in contexts with abstract NP referents. The data show that whenever MI strategy was used, a spatial preposition such as "in", "on", or "at" was selected. This suggests that Mental Imagery is linked not only to the concreteness of the NP referents, but also to the preposition selected to represent the relationship between the referents.

**Discussion of Verbal Reports.**

The data show that whenever MI strategy is used, a spatial preposition such as "in", "on", or "at" is selected. Whenever a spatial preposition is selected, MI strategy or a closely related strategy is used. This suggests that Mental Imagery is linked not only to the concreteness of the NP referents, but also to the preposition selected to represent the relationship between the referents.

Here are some examples of the NNS's explanations. These examples are focused only on the spatial prepositions:

**Sentence 2.** The birdbath is the centerpiece _in__ Joe's lawn.
Speaker 8. (VTN) The speaker said that she didn't know the meaning of either "birdbath" or "centerpiece" but did imagine a lawn and a sparrow.

Speaker 5. (JPN)"There is some kind of a yard and right in the middle there is a center. . . ."

Speaker 3. (JPN)"I was debating between "in" and "of" but the decided to go for "in" because it's a spatial thing. I imagined a box and something in it. A yard with a fence."

Speaker 1. (CHN) "Sounds better than "on.""

Sentence 13 We have some problems _in__ our English.

Speaker 6 (BENG) "When I visualize English, I see something with a bottom. It is very hard to visualize "with." It is like hugging English."

Speaker 9 (CHN) "English is like a shape. A broad shape. And problems are inside the shape."

Speaker 17 (JPN) "English is a broader thing than problems. The problems are inside but not in the middle. (here the subject drew a picture of a oblong and a small circle closer towards one of the narrow ends)"

These examples show how the speakers explain the preposition choices they made and may indicate how they go about making the decision to use a spatial preposition. In each case there is a somewhat vivid mental picture of the situation or event referred to by the sentence reported by the learner. However; there are cases discussed later in this paper.
when a different strategy may override Mental Imagery, in which case a different preposition is used as well.

The data contains five instances when Reconstruction was used in connection with a spatial preposition. These instances require special attention.

I. Speaker 1, sentence 14 (The preceptor is the cornerstone in the house where they live). Here the speaker gave the following explanation: "I know what the word preceptor means, but it does not fit this sentence, so it must be something in the house."

II. Speaker 10, sentence 12 (The idea of discrimination is the centerpiece in his augury) Here the speaker said that "centerpiece must be something in the middle. . . "

III Speaker 10, sentence 16 (The broken engine is the most disappointing moiety in this dead lawnmower) The speaker explained that "moiety" must be something inside the lawnmower.

IV Speaker 12, sentence 16 the speaker said that "moiety" is "a part in the engine."

V Speaker 14, sentence 14 (The preceptor is the cornerstone in the house where they live) Here the speaker explained that the "house is something that contains the other. . . "
In all five instances, although the learners were using Reconstruction, their explanations suggest that the container metaphor (Lakoff and Johnson 1980) is at work here. Lakoff and Johnson do not mention mental imagery; however, we believe it is reasonable to assume that there must be a close link between mental imagery and the metaphorical mapping of our human spatial "in-out" orientation onto our language.

There is one instance of the choice of "of" in conjunction with a very strong MI in the data which is hard to explain.

Speaker 4. (SPN) Sentence 17. (The reset button is the most useful component of this extraordinary contrivance). Here the speaker had a very strong mental image of the "reset" button right next to "turbo" button on an IBM computer (which is an extraordinary contrivance). Perhaps, MI was overridden by the NNS's already existing competence. so, this instance could be counted as an example of group I.

Phase II

Research Question:

Do Vietnamese speakers of English as a second language tend to use spatial prepositions which can not be attributed to NL transfer in contexts which allow both spatial and abstract prepositions? If they do, then to what extent?

RESEARCH DESIGN

I Subjects
The subject pool for this phase has been narrowed to the students of General College at the University of Minnesota. The subjects have been selected from two groups:

Group I. 31 native speakers of Vietnamese between 18 and 30 years old who have lived in U. S. for more than three years.

Group II. a control group of 29 native speakers of English between 18 and 20 years old.

**Instruments**

I. **Cloze Test**

The test consists of 7 sentences which are distributed over the following contexts:

Type A (4 items) NP1 is NP2 of NP3

1. concrete NP referents (2 items)
2. abstract NP referents (2 items)
3. NP2 is a non-existing word that sounds like an English word.

Type B (1 item) NP1 with NP2

*Note:* This test was developed both in English and Vietnamese. The Vietnamese version was done by a native Vietnamese speaker consultant Khiet Nguyen.

II. **Written Reports**

As part of the test, the learners were asked to reflect on their preposition choice and describe the process by which the preposition was selected. Also, they were asked to
indicate for each sentence whether they had a picture in their minds and, if they answered positively, then they were asked to describe the picture.

**Test Procedure**

Step I. The Vietnamese version of the test was administered to 13 native speakers of Vietnamese (group 1).

Step II. The English version was administered to 18 native speakers of Vietnamese (group 2).

Step III. The Vietnamese version was administered to 18 native speakers of Vietnamese (group 2).

Step IV. The English version was administered to 29 native speakers of English (group 3).

**Results**

The data collected for each group was run through t-tests where various pairs of groups were compared. The following tables illustrate the results:
Table 1 shows that the native speakers of Vietnamese prefer to use abstract prepositions over concrete.

**Table 1. t-test (dependant sample) 13 pairs**

**NL use of prepositions by Vietnamese speakers**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>sd</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>3.92</td>
<td>0.76</td>
<td>2.28*</td>
</tr>
<tr>
<td>Concrete</td>
<td>2.92</td>
<td>0.86</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows that abstract prepositions are preferred by native speakers of Vietnamese in their native language (group 1) as compared to the behavior of native speakers of Vietnamese in English (group 2). Here the results of two different groups are compared; abstract prepositions are used as the basis for comparison.

**Table 2. t-test (independent samples)**

**NL and IL use of abstract prepositions**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Sd</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>group 1</td>
<td>3.92</td>
<td>0.76</td>
<td>2.57*</td>
</tr>
<tr>
<td>group 2</td>
<td>2.94</td>
<td>1.34</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that Vietnamese speakers of English (group 2) favor concrete prepositions in English more than native speakers of Vietnamese (group 1) in their native language. Here the results of two different groups are compared; abstract prepositions are used as the basis for comparison.

* p< 0.05
Table 3 t-test (independent samples)

Vietnamese NL and IL preference for concrete prepositions

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Sd</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>group 1 (13sub)</td>
<td>2.92</td>
<td>0.86</td>
<td>-2.52*</td>
</tr>
<tr>
<td>group 2 (18sub)</td>
<td>3.94</td>
<td>1.39</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows that native speakers of English favor abstract prepositions over concrete.

Table 4 t-test (dependent sample) 29 pairs

NS's of English preference for abstract over concrete prepositions

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Sd</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>4.03</td>
<td>1.29</td>
<td>2.43*</td>
</tr>
<tr>
<td>Concrete</td>
<td>2.89</td>
<td>1.23</td>
<td></td>
</tr>
</tbody>
</table>

Tables 5 and 6 show that there is no significant difference in the performance of the same group of Vietnamese L1 speakers on native language and English tests, which may indicate that there is cross-linguistic influence here. The Vietnamese test was administered after the English test, and, in light of our analysis, English influence may be responsible for the learners picking more spatial prepositions in Vietnamese than they normally would (cf. Table 1).
Table 5 t-test (dependent sample) 18 pairs

NL Vietnamese group 2 shows no preference for either abstract or concrete prepositions in L1 Vietnamese

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Sd</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>3.61</td>
<td>1.37</td>
<td>-.74</td>
</tr>
<tr>
<td>Concrete</td>
<td>3.11</td>
<td>1.53</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 t-test (dependent sample) 18 pairs

NL Vietnamese group 2 shows no preference for either abstract or concrete prepositions in L2 English

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Sd</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>2.94</td>
<td>1.34</td>
<td>-1.56</td>
</tr>
<tr>
<td>Concrete</td>
<td>3.94</td>
<td>1.39</td>
<td></td>
</tr>
</tbody>
</table>

The comparison of results given in Table B shows that Group I tended to favor abstract prepositions over concrete ones, so did Group II. Group II, however, preferred to use spatial prepositions in the same contexts.
Table B

<table>
<thead>
<tr>
<th></th>
<th>Vietnamese NS L1 test</th>
<th>Vietnamese NS L2 (Eng.)test</th>
<th>English NS L1 test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>abstract prep.: cua, voi, ve, cho, vor</td>
<td>Concrete prep.: trong, to, toi vioi, o, tren</td>
<td>abstract prep.: of, with, for</td>
</tr>
<tr>
<td></td>
<td>concrete prep.: in, on, to,</td>
<td></td>
<td>concrete prep.</td>
</tr>
<tr>
<td>Type A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete NP referent</td>
<td>S1 0 12 4 17 20 10</td>
<td>S2 10 3 11 10 15 15</td>
<td>S6 9 4 3 18 5 25</td>
</tr>
<tr>
<td></td>
<td>S3 11 2 11 9 24 7</td>
<td>S4 3 9 10 10 17 12</td>
<td>S7 10 3 9 12 14 15</td>
</tr>
<tr>
<td>Abstract NP referent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type B</td>
<td>S5 8 5 14 6 28 1</td>
<td>Total(num) 48 17 48 55 86 63</td>
<td>Total(%) 74% 26% 46% 54% 58% 42%</td>
</tr>
</tbody>
</table>

The numbers for sentences S1 and S4 were excluded from the total count on the grounds that they were treated as concrete contexts by native speakers of Vietnamese and, therefore, are not useful to this study.

CONCLUSION AND DIRECTION FOR FURTHER RESEARCH
This study suggests that metaphorical imagery may be a cognitive process responsible for shaping interlanguage along with NL transfer and overgeneralization and, also that spatial relationships may be more prototypical (Kellerman 1979) than abstract ones. Much more needs to be done in terms of refining the instruments for this kind of study. For further research the oral verbal reports ought to be carried out concurrently with the subjects filling out the test (Kellerman, personal communication). One of the problems with this study was that the reliability of the subject’s responses decreases with time. The more time allowed to elapse between the test and the interview, the less assurance one can have that what the subject is saying he/she thought during the test actually was what he/she thought. One way to diminish the possibility of getting such spurious data is to have the subjects think aloud during the test. The think aloud test will also help to get at the subject’s first reaction to the sentences and prevent the subject from monitoring their responses to some degree.

According to Cohen (p.c) the think aloud test ought to be administered to subjects that have been trained to verbalize their thoughts while completing a task. With untrained subjects, there is a greater risk that they will not verbalize some vital information thus diminishing the reliability of the results. The subjects can be trained by taking a pre-test or a number of pre-tests similar to the actual test until they become comfortable with the think aloud technique.

Also, the link between NNS’s spatial cognition and their second language expressed through the use of spatial metaphors may be tested on other areas of language, apart from prepositions. One possibility would be to look at how metaphors manifest themselves in
the acquisition of Russian verb aspect where the L2 learners have to do a lot of restructuring of their conceptual systems. Russian language has a rich aspectual system that enables the speakers of Russian to distinguish between various aspects of an event such as its beginning, end or other stages. Events referred to by verbs in Russian ought to be sufficiently delimited either by an aspectual role assigned to the verb’s aspectual grid or the Accusative case assigned to the object NP for sentences that have a direct object NP (Pakhomov 1996). The concept of aspect referred to here is somewhat different from the grammatical aspect discussed in the previous section. Tenny defines aspect as referring to "the internal temporal properties of the event, such as duration, iterativity, etc. . .." In her proposal, aspect is more of a property of the event rather than the lexical item. She proposes three possible types of aspectual roles MEASURE, TERMINUS and PATH.

The roles are defined as follows:

MEASURE

this role is assigned to the internal argument of a verb that either undergoes some internal change or motion or measures out and defines the temporal end point of the event.

PATH

is a role which is assigned to a parameter that provides a line along which the event is measured out.

TERMINUS

is assigned to an argument of the verb which marks the endpoint of the event
The so-called “multidirectional” motion verbs are especially interesting in respect to aspectual roles and possible metaphorical uses of spatial terms and mental imagery. For example, the verb “letet’” ‘to fly’ used in the following two sentences present an example of such multidirectional verbs with its unidirectional counterpart:

1. “On letal (past) v Moskvu (Acc)” ‘he flew (there and back) to Moscow’
2. “On letel (past) v Moskvu (Acc)” ‘he flew (there) to Moscow’

The verb “letal” in (1) indicates that the referent of “on” ‘he’ has flown to Moscow and came back at least once. The verb in (2) describes a one-way trip and does not offer any other information concerning directionality. The sentence in (1) can be said to have the following aspectual roles: MEASURE and PATH. The MEASURE role comes from the sense of multidirectionality of the verb and the PATH role comes from the prepositional phrase which provides a parameter along which the motion takes place. According to Tenny, the TERMINUS role does not apply because there is no marking of the endpoint of the event referred to by (1). The sentence in (2) has only one aspectual role, that of PATH. The verb itself does not measure out the event in any way, it only states the fact that an action took place some time in the past and does provide any other information either about the endpoint of the event or any other limits. Thus, the events referred to by the two sentences can be said to differ in the number of points that delimit them. Event (1) is delimited by two points (destination and return) and event (2) is delimited by one point (destination).
The distinction between the number of delimiting points may determine the kinds of mental images evoked in the mind of a non-native speaker of Russian. For example, a prediction could be made that events with fewer delimiting points may be easier to picture, which can be tested with a cloze test where the NNS of Russian are asked to fill in the blanks in a text that has sentences of the type presented in (1-2). If the hypothesis is correct the subjects will tend to use more unidirectional verbs to refer to situations that require multidirectional verbs. One should keep in mind, however, that subjects for such a test would have to be highly proficient in Russian. Since verb aspect is considered to be a fairly advanced and complex category in Russian language, lower proficiency subjects will either not be able to do the task or will bring an element of randomness into the test. This can be controlled to some extent with post-test interviews, but is still undesirable.
REFERENCES


Appendix A

Table C Strategies

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<th>Sentence</th>
<th>&quot;Feels right&quot;</th>
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Appendix B

Sentence Completion Test (Phase I)

Type A
I  Abstract NP referents

1. Our professor said this lecture ____ the highlight ____ the day.
6. Habilimentry was the basic premise ____ his life
10 Dr.Gundel's lecture was the inveterate ____ the whole course ____ modern grammar.
12. The idea of discrimination was the centerpiece ____ his augury.

II  Concrete NP referents

2. The birdbath is the centerpiece _____ Joe's lawn.
14. The preceptor is the cornerstone ____ the house where they live.
16. The broken engine was the most disappointing moiety ____ this dead lawnmower.
17. The reset button is the most useful component ____ this extraordinary contrivance.

III  Mixed referents

4. The table of contents ____ *Time* magazine usually includes 25 items.
11. Students ____ the most active members ____ American society.

Type B

8 There are some common issues ____ these types of harassment
13. We have ______ problems _____ our English.
Distractor sentences

3. The cat jumped ____ the fence and ran into the house.
5. Johnny screamed as he fell _____ the stairs
7. Two boys crawled ____ the yard quietly.
9. Many people want to get ___ of their prejudices.
15. A computer can be dismantled _____ two to three hours.

Sentence Completion Test (Phase II)

Type A

Concrete NP refernts

1. The burned apple tree is the centerpiece _____ this strange garden.
2. The 56 inch TV is the main attraction _____ this old house.
6. The small gift shop is the most significant prevacriment _____ the Wiseman museum.

Abstract NP refernts

3. Responsibility to the society is the cornerstone _____ this well designed theory.
4. Unlimited freedom is the most important point _____ this long discussion.
7. Broad education is the largest incepita. _____ this famous institution.

Type B
5. These students at the table have a few problems ____ their French.