# The Semantics of *khin3* and *loŋ1* in Thai Compared to *up* and *down* in English: A Corpus-Based Study

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## Abstract

This corpus-based study analyzes meanings of *khin3* 'ascend' and *loŋ1* 'descend' in Thai in comparison with *up* and *down* in English. Data came from three corpora: the Thai National Corpus (TNC) (Aroonmanakun et al., 2009), the British National Corpus (BNC), and the English-Thai Parallel Concordance (Aroonmanakun, 2009). Results of the analyses show that there are senses of the vertical spatial terms *khin3* and *loŋ1* in Thai that overlap with those of *up* and *down* in English. This reflects a universal image schema of vertical movement and similar semantic extension processes in the two languages. Data from the parallel corpus also reveal that the vertical spatial terms *khin3* and *loŋ1* do not always occur in the same contexts with *up* and *down*. But, when they do, the frequently shared meaning involves vertical movement, which is the basic sense of the terms. The use of corpora as a tool to study the semantics of vertical spatial terms in Thai and English makes it possible to obtain objective and naturalistic data as well as to observe frequency of various senses that are in use.

## 1 Introduction

Expressions of spatial directions are common in the world's languages. Given that spatial direction is a basic concept of humans (Langacker, 1987), spatial terms are expected to be of high frequency in language use. This study examines spatial terms for vertical directions in Thai and English. In particular, we focus on *khin3* 'ascend' and *loŋ1* 'descend' in Thai in comparison with *up* and *down* in English.

The words *khin3* 'ascend' and *loŋ1* 'descend' in Thai are high-frequency words whose fundamental meanings are about vertical movement of upward and downward directions, respectively. Similarly, the words *up* and *down* in English have the basic senses of vertical directions. Moreover, both *khin3* and *up* can be used to denote non-directional meanings (such as *man4 caj1* <u>*khin3*</u> 'be more confident' and *speed* <u>*up*</u>), and this is also true with the pair *loŋ1* and *down* (such as *sin3sut2* <u>*loŋ1*</u> 'end' and *close* <u>*down*</u>). However, while *khin3* and *loŋ1* occur as main verbs or subsidiary verbs in serial verb constructions in Thai, *up* and *down* rarely occur in verb slots in English; they usually appear as satellites accompanying verbs. It is therefore interesting to investigate to what extent these vertical spatial expressions, which belong to different grammatical categories, overlap in terms of senses.

To obtain objective, up to date and naturally occurring language data produced by various native speakers, this study utilized data from three corpora. The English data came from the British National Corpus (BNC), and the Thai data were drawn from the Thai National Corpus (TNC) (Aroonmanakun et al., 2009). A parallel corpus, the English-Thai Parallel Concordance

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(Aroonmanakun, 2009), was also used to compare occurrences of *khin3* with *up*, and *loŋ1* with *down* in the same contexts. The aim of this paper is to analyze meanings of *khin3* and *loŋ1* in Thai, and *up* and *down* in English, as found in the corpora in order to compare senses of these vertical spatial terms used by native speakers of each language.

## 2 Previous studies

### 2.1 *Up* and *Down* in English

Tyler and Evans (2003) describe *up* and *down* in the framework of cognitive semantics. The image schema of *up* shows that a trajectory (TR) moves towards the top of a landmark (LM). To illustrate this, in *Jennifer climbed up the mountain*, where *Jennifer* is the TR and *mountain* is the LM, the TR moves upward to the top of the LM. On the contrary, the image schema of *down* displays movement of a TR towards the bottom of a LM. For example, in *The water went down the drain*, *water* is the TR while *drain* is the LM. The TR moves downward to the LM.

It is obvious that the meanings of *up* and *down* are not limited to vertical directions. The spatial image schemas mentioned earlier are also used to express non-spatial meanings by means of two main cognitive processes, namely **conceptual metaphor** and **metonymy**. These processes link different meanings of each directional word together (Kövecses, 2002). Lakoff and Johnson (1980) state that conceptual metaphor is a language phenomenon in which a speaker understands a particular concept through the use of another concept. For example, being in consciousness is associated with the concept of UP (as in *I'm up already*) whereas being in unconsciousness is connected to the concept of DOWN (*He fell asleep*). Lakoff and Johnson explain that humans sleep lying down and stand up when they awake. Therefore, the concept of DOWN is expanded to being unconscious, and the concept of UP to being conscious. Metonymy, on the other hand, refers to a process which uses a salient entity that is easy to understand as the referent point that links to a less salient entity (Langaker, 1999). Generally, a metonymy is the use of a salient phase or word instead of a non-salient one. As an instance, in *He picked up the phone*, manually picking a phone up is only a part of telephone answering procedures, but now 'picking up the phone' implies 'answering the phone' rather than just a part of the process (Seto, 1999). Through these cognitive processes, the original meanings involving vertical directions of *up* and *down* can be expanded.

Previous studies of *up* and *down* in English mostly concerned their metaphorical meanings (Lee, 2001; Otani, 2006; Hampe, 2006). The findings were usually consistent with Lakoff and Johnson (1980)'s proposal. According to Lakoff and Johnson, there are 10 conceptual metaphors of the concepts UP and DOWN in English, as illustrated in Table 1.

| | |
|---|---|
| HAPPY IS UP | SAD IS DOWN |
| CONSCIOUS IS UP | UNCONSCIOUS IS DOWN |
| HEALTH IS UP | SICKNESS OR DEATH IS DOWN |
| HAVING CONTROL OR FORCE IS UP | BEING SUBJECT TO CONTROL OR FORCE IS DOWN |
| MORE IS UP | LESS IS DOWN |
| FORESEEABLE FUTURE IS UP | - |
| HIGH STATUS IS UP | LOW STATUS IS DOWN |
| GOOD IS UP | BAD IS DOWN |
| VIRTUE IS UP | DEPRAVITY IS DOWN |
| RATIONAL IS UP | EMOTIONAL IS DOWN |

Table 1: Conceptual metaphors of UP and DOWN (Otani, 2006; adapted from Lakoff & Johnson, 1980)

Boroditsky (2001) did an experimental study to test whether English and Mandarin speakers thought about time differently. She found that Mandarin speakers commonly used vertical spatial terms *shàng* 'ascend' and *xià* 'descend' to talk about time (as in *shàng ge yuè* 'last month', *xià ge yuè* 'next month') while English speakers tended to think about time horizontally, e.g., *last (previous) month, next (following) month*. Later, Chun (2002) and Dong (2010) compared the meanings of *up* and *down* in English to *shàng* 'ascend' and *xià* 'descend' in Mandarin. The results showed that the conceptual metaphors of the words *shàng* 'ascend' and *xià* 'descend' in Mandarin were similar to those of *up* and *down* in English, except for time dimension. While a later time was expressed with UP and an earlier time with DOWN in English, Mandarin associates a

later time with XIA and an earlier time with SHANG. This shows that senses of words denoting vertical directions differ across languages.

## 2.2 *khɨn3* 'ascend' and *loŋ1* 'descend' in Thai

Thai directional verbs *khɨn3* 'ascend', *loŋ1* 'descend', *khaw3* 'enter' and *ʔɔɔk2* 'exit' are categorized as non-deictic verbs (Zlatev and Yanglang, 2004). Previous studies on Thai directional verbs *khɨn3* and *loŋ1* focused on meanings and functions of these verbs (Panupong, 1977; Phanthumetha, 1982; Luksaneeyanawin, 1986; Thepkanjana, 1986; Saengchai, 1993; Thepkanjana and Uehara ,2008). The directional verbs *khɨn3* and *loŋ1* express basic meanings about directions with respect to vertical axis. They can function as main verbs and subsidiary verbs. As a main verb in (1) and a subsidiary verb in (2), *khɨn3* shows an upward direction. Examples (3) and (4) have *loŋ1* as a main verb and a subsidiary verb, respectively. *loŋ1* denotes the meaning of a downward direction. (Examples were taken from Saengchai (1993).)

(1) *luːk3saːw5* *khɨn3* *paj1* *boʔn1*
daughter ascend go on
*baːn3* *lɛːw4*
house perfective
'The daughter already went up the house.'

(2) *thuk4khon1* *chuəj3* *kan1* *khon5*
everyone help each other carry
*sam5phaː1raʔ4* *khɨn3* *caːk2* *phɛː1*
luggage up from raft
'Everyone helped each other carry luggage up from the raft.'

(3) *khun1jaːj1* *loŋ1* *maː1* *pəː2*
grandma descend come open
*praʔ2tuː1* *haj3*
door give
'Grandma came down to open the door (for someone).'

(4) *riə1bin1* *kam1laŋ1* *rɔn3* *loŋ1*
airplane progressive hover down
*khun1miŋ5*
Kunming
'An airplane is hovering down to Kunming.'

Furthermore, *khɨn3* and *loŋ1* also appear in non-spatial situations to indicate, for example, change in quality or quantity (in (5) and (6)) and perfective aspect (in (7) and (8)).

(5) *khaʔ2naːt2* *khɔːŋ* *huə5* *caʔ2*
size of head modal
*phɔːŋ1* *toː1* *khɨn3*
swell big up
'Head size will swell up.'

(6) *phon5phaʔ2lit2* *caʔ2* *lot4*
product modal decrease
*loŋ1* *huəp3haːp3*
descend drastically
'Products will decrease drastically.'

(7) *kaːn1praʔ2kan1saŋ5khom1* *riʔ4rəː3*
social security start
*khɨn3* *thiː3* *thaʔ4wiːp3* *juʔ4roːp2*
ascend at continent Europe
'Social security started in Europe.'

(8) *pan1haː5* *thuk4* *jaːŋ2* *juʔ4tiʔ2*
problem every classifier end
*loŋ1*
descend
'Every problem ended.'

A cross-linguistic comparison exists between subsidiary directional verbs *khɨn3* and *loŋ1* in Thai, and their equivalents *shàng* 'ascend' and *xià* 'descend' in Mandarin. Sae-Jia (1999) found that these directional verbs in Thai and Mandarin were similar regarding their meanings and usage. Nonetheless, there were contexts in which *khɨn3* and *loŋ1* were not used in Thai, when *shàng* and *xià* were used in Mandarin. However, it was not clear from Sae-Jia's work why *khɨn3* and *loŋ1*were absent in those contexts. To our knowledge, there has not been a study that examines the similarities and differences between *khɨn3* and *loŋ1*, and the English counterparts *up* and *down*.

The current study has two main parts. The first part analyzes and compares the meanings of *khɨn3* and *loŋ1* in Thai with *up* and *down* in English, by using the national corpora as the data resource. The second part compares the vertical spatial terms of each language in identical semantic contexts by using a parallel corpus as a tool.

## 3 Meaning comparison: *khɨn3* and *loŋ1* in the Thai corpus vs. *up* and *down* in the English corpus

The Thai data came from the largest Thai language corpus, the Thai National Corpus (TNC) (Aroonmanakun et al., 2009), which contains more than 31 million words of written samples from various genres including academic texts, non-academic texts, newspapers, fiction, law and music. The English data were taken from the British National Corpus (BNC), which contains 100 million words of written and spoken data from various sources, such as newspapers, journals, academic texts, fiction, letters and essays.

Five hundred samples of each of the vertical spatial terms were drawn from the corpora by setting *khɨn3*, *loŋ1*, *up* or *down* as the search input, resulting in 2,000 samples altogether. Each sample was analyzed for its underlying sense. It should be noted that the semantic analyses were inevitably influenced by the words with which the vertical spatial terms co-occurred. The analyses of *khɨn3* and *loŋ1* were cross-checked with a native speaker of Thai. In the same way, those of *up* and *down* were cross-checked with a native speaker of English.

For the Thai vertical directional verb *khɨn3*, it appears both as a main verb (N=85, 17%) and a subsidiary verb (N=415, 83%). We have found seven main senses of *khɨn3*, ranging from the most frequent to the least frequent. (Two of the senses, i.e. to show accomplishment and to show positive attitude, are observed only when *khɨn3* functions as a subsidiary verb.)

1. **Increase** (N=166, 33.2%)

(9) *man4caj1* *khɨn3*
confident ascend
'be more confident'

2. **Occur** (N=109, 21.8%)

(10) *hiw5* *khɨn3* *ma:1* *than1thi:1*
hungry ascend come suddenly
'become hungry suddenly'

3. **Show accomplishment** (N=100, 20%)

(11) *juʔ4* *khɨn3*
incite ascend
'have been incited'

4. **Move towards a higher position** (N=93, 18.6%)

(12) *lɔ:j1* *khɨn3* *ma:1*
float ascend come
'float up'

5. **Be subordinate to** (N=24, 4.8%)

(13) *ka:n1to:3tɔ:p2* *khɨn3* *ʔu:2*
reaction ascend stay
*kap2* *siŋ2ra:w4*
with stimulus
'the reaction depends on the stimulus'

6. **Show positive attitude** (N=4, 0.8%)

(14) *thaj2ru:p3* *khɨn3*
take a photo ascend
'photogenic'

7. **Form a shape** (N=3, 0.6%)

(15) *khɨn3* *khro:ŋ1*
ascend format
'form a format'

The English vertical directional word *up* shows six main senses. While some of them are identical to the senses of *khɨn3*, the others are different.

1. **Show accomplishment** (N= 219, 43.8%)

(16) *Syl was eating them all up*

2. **Move towards a higher position** (N=160, 32%)

(17) *slide your hands up*

3. **Increase** (N=46, 9.2%)

(18) *Rib Transfer Carriage really speed up my knitting*

4. **Be in a higher position** (N= 41, 8.2%)

(19) *They're in a bag up the chimney*

5. **Occur** (N=30, 6%)

(20) *The crossbows came up again*

6. **Be subordinate to** (N=4, 0.8%)

(21) *it is up to each mother to decide to work or not*

Comparing the meanings of the Thai verb *khɨn3* with those of *up* in English, the analysis shows that there are five senses that overlap, which are **to increase**, **to occur**, **to show accomplishment**, **to move towards a higher position**, and **to be subordinate to**. However, *khɨn3* is different from *up* in that the meanings of showing positive attitude and forming a shape are used only in Thai while being in a higher position is seen only in English.

With regard to frequency of occurrence, the most common meanings found for *khɨn3* are to increase (33.2%), to occur (21.8%), to show accomplishment (20%), and to move towards a higher position (18.6%) whereas those found for *up* are to show accomplishment (43.8%) and to move towards a higher position (32%). The other meanings occur less than 10% of the time. It can be further observed that two overlapping senses of *khɨn3* and *up*, i.e. to move towards a higher position and to show accomplishment, are among those of high frequency in both languages.

The findings correspond with Lakoff and Johnson (1980). The vertical spatial terms *khɨn3* in Thai and *up* in English imply an increase, as suggested by the conceptual metaphor MORE IS UP. Moreover, the conceptual metaphor GOOD IS UP can be perceived in the use of *khɨn3* to express positive attitude in Thai.

For the Thai vertical spatial verb *loŋ1*, it also appears both as a main verb (N=166, 33.2%) and a subsidiary verb (N=334, 66.8%). There are six main senses, ranging from the most frequent to the least frequent. (Two of the senses, i.e. to show accomplishment and to increase in negative quality, are observed only when *loŋ1* functions as a subsidiary verb.)

1. **Move towards a lower position** (N=203, 40.6%)

(22) *dəːn1* *loŋ1* *paj1*
walk descend go
'walk down'

2. **Decrease** (N=110, 22%)

(23) *raː1khaː1* *thɔːŋ1* *loŋ1*
price gold descend
'gold price decreased'

3. **Write or list something** (N=99, 19.8%)

(24) *loŋ1* *ban1chiː1*
descend account
'post an account'

4. **Show accomplishment** (N=57, 11.4%)

(25) *sin3sut2* *loŋ1*
end descend
'end'

5. **Increase in negative quality** (N=20, 4%)

(26) *ʔɔːn2ʔɛː1* *loŋ1*
weak descend
'weaker'

6. **Participate** (N=11, 2.2%)

(27) *loŋ1* *khɛŋ5khan1*
descend competition
'participate in a competition'

The analysis of *down* in English also reveals six main senses as shown in the following listed by order of frequency.

1. **Move towards a lower position** (N=242, 48.4%)

(28) *They laughed, and skied happily down the white snow*

2. **Be in a lower position** (N=100, 20%)

(29) *Will you see her from down there?*

3. **Show accomplishment** (N=90, 18%)

(30) *you've passed your second test, so it's two down and four more to go*

4. **Decrease** (N=40, 8%)

(31) *Can you turn the heating down?*

5. **Write or list something** (N=19, 3.8%)

(32) *they're putting it down in the paper*

6. **Feel unhappy** (N= 9, 1.8%)

(33) *I went down so hard when I didn't get that job*

When we compare the senses of *loŋ1* above with those of *down*, there are four senses that overlap, namely **to move towards a lower position**, **to decrease**, **to write or list something**, and **to show accomplishment**. Nevertheless, *loŋ1* is different from *down* in that it can denote the meanings of an increase in negative quality and participation. Besides, the meaning of feeling unhappy can be found only with the English *down*.

In terms of frequency, the most frequent meaning of *loŋ1* that appears in the samples is to move towards a lower position (40.6%), and the same is true for *down* (48.4%). The other common meanings of *loŋ1* are to decrease (22%), to write or list something (19.8%), and to show accomplishment (11.4%) while those of *down* are to be in a lower place (20%) and to show accomplishment (18%). The other meanings are less than 10%. Hence, the highly frequent meanings shared by *loŋ1* and *down* are to move towards a lower position and to show accomplishment.

The analysis of *loŋ1* and *down* is also consistent with Lakoff and Johnson (1980). The vertical spatial terms showing downward directions in both Thai and English indicate a decrease, conforming to LESS IS DOWN. The Thai verb *loŋ1* is also used to show an increase in negative quality, which follows the conceptual metaphor BAD IS DOWN. Lastly, as suggested by the conceptual metaphor SAD IS DOWN, *down* in English involves unhappy feeling.

To sum up, the meaning comparison reveals that the Thai vertical spatial terms *khɨn3* and *loŋ1*, and the English *up* and *down*, have partly overlapping senses. One of the frequently observed meanings in both languages is movement towards a higher or lower position, which is the basic sense of the vertical spatial terms. The shared sense of vertical movement probably results from a universal image schema of spatial directions. Moreover, the overlapping senses of these terms could also come from the similar cognitive processes of conceptual metaphor and metonymy in Thai and English. As for those senses that do not overlap, they could possibly disclose differences in terms of linguistic structures as well as cultural experience.

## 4 Context of occurrence: *khɨn3 – up* and *loŋ1 – down* in the parallel corpus

The purpose of the second part of the study is to investigate to what extent the pairs *khɨn3 – up* and *loŋ1 – down* occur in the same contexts. In order to do so, we utilized an English-Thai parallel corpus. According to Glottopedia (2009), a parallel corpus is a corpus built up from an original document in a language and its translated version in another language. This type of corpus is useful for a cross-linguistic study. Data in this study came from the English-Thai Parallel Concordance (Aroonmanakun, 2009), which contains up to 66,402 data pairs from various English to Thai translation works, such as translated fiction and translation students' term papers.

To begin with, we drew 100 data pairs from the concordance by setting the Thai directional verb *khɨn3* as the search input only. The search input in English was left unspecified. The same procedure was executed for *loŋ1*. This brought about 200 samples with *khɨn3* and *loŋ1* as the search input.

We then examined whether the English vertical directional words *up* and *down* also appeared in the same contexts in the English original texts. The results show that 42 instances (42%) of *khɨn3* occur in the same context with *up*. For *loŋ1*, there are only 36 instances (36%) where *loŋ1* and *down* match. Figure 1 displays the percentage of co-occurrence between *khɨn3* and *up*, and between *loŋ1* and *down*.

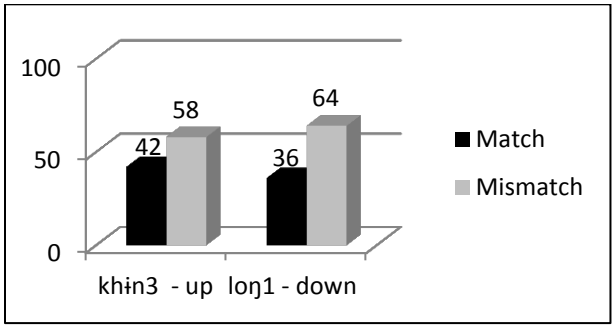


Figure 1: Percentage of co-occurrence between *khɨn3* and *up*, and between *loŋ1* and *down*

The main reason why more than half of the Thai vertical directional verbs do not appear in the same context as the English directional terms has to do with structural differences between Thai and English. To illustrate this, certain English verbs such as *rise*, *fall*, and *drop* contain an implied sense of vertical movement so the directional words *up* and *down* are not indispensable. Directional verbs in Thai, on the other hand, frequently occur as part of serial verbs to convey directional senses. The following examples were taken from the corpus.

(34) **Thai**:
*khwa:m1gro:t2* *phuəj1phuŋ3*
angry rise abruptly
*khɨn3* *ma:1* *lɛʔ4* *jut2*
ascend come and stop
*thi:3* *huə5caj1* *thə:1*
at heart you

**English**:
*And an angry feeling rose in her and stopped around her heart.*

(35) **Thai**:
*na:3rot4* *rə:m3* *phuŋ3* *tam2* *loŋ1*
front of car begin dart low descend

**English**:
*The nose of the car dropped.*

Moreover, while English has specific morphemes to express the comparative degree, Thai relies on the word *khɨn3* and *loŋ1*. Examples are seen in (36) and (37).

(36) **Thai**:
*du:1* *khun1* *saʔ2baj1* *khɨn3*
watch you good ascend
*yɛ4* *chiaw1*
much indeed

**English**:
You're much better.

(37) **Thai**:
*rot4jon1hɔʔ2* *khɔ:j3khɔ:j3*
flying car slowly
*lɔ:j1* *tam2* *loŋ1* *ma:1*
float low descend come

**English**:
Lower and lower went the flying car.

Another reason for the mismatch between the Thai and English directional words in the same contexts is that some of the Thai directional verbs occur as part of idioms and fixed phases. It is then not surprising that the word *up* or *down* are absent in these contexts. Following are some examples.

(38) **Thai**:
*loŋ1* *miə1*
descend hand

**English:**
start to do something

(39) ***Thai:***
*khɨn3* *ŋən1*
ascend money

**English:**
cash (check)

Next, to look closely at the contexts in which both the Thai and English vertical spatial expressions occur, we set *khɨn3* and *loŋ1* as the search input in Thai, and at the same time set *up* and *down* as the search input in English. Two hundred data pairs (100 pairs for *khɨn3 – up* and 100 pairs for *loŋ1 – down*) were gathered from the concordance. Figure 2 shows the percentage of senses of *khɨn3 – up* and *loŋ1 – down* that occur in the same contexts. When *khɨn3* is used in Thai and *up* in English, the directional terms express one of the three senses, namely to move towards a higher position (81%), to occur (12%), and to increase (7%). Examples are seen in (40). For *loŋ1* and *down*, when they co-occur, they share only two senses: to move towards a lower position (98%) and to decrease (2%). Examples are shown in (41).

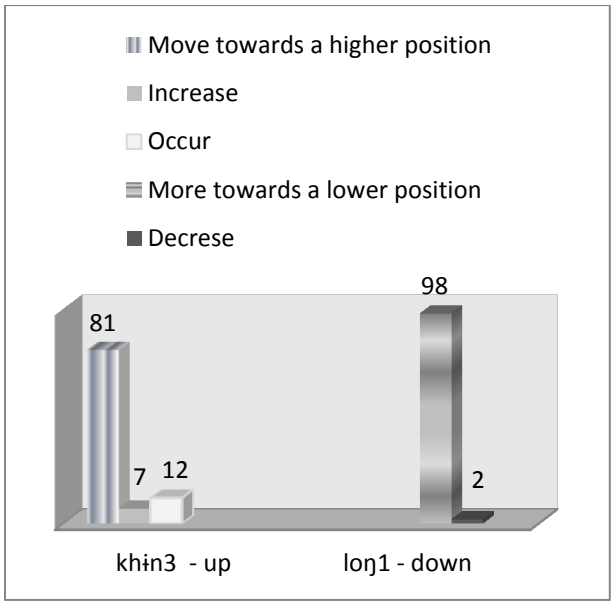


Figure 2: Percentage of senses of *khɨn3 - up* and *loŋ1 - down* that occur in the same contexts

(40) **Thai**:
*bak4bi:k2 luk4 khɨn3 ji:n1*
Buckbeak rise ascend stand
**English**:
Buckbeak stood up.

(41) **Thai**:
*khaw5 kom3 loŋ1 mɔ:ŋ1 tha:1rok4*
he bent descend look baby
**English**:
He bent down to take a look at the baby.

To summarize, the analysis of the pairs *khɨn3 – up* and *loŋ1 – down* in the English-Thai Parallel Concordance shows that when the contexts are held constant, less than half of instances of *khɨn3* and *loŋ1* in Thai correspond with instances of *up* and *down* in English. The mismatch is accounted for in light of structural differences between the two languages as well the fact that the Thai directional words sometimes appear in formulaic expressions. As for instances in which *khɨn3 – up* and *loŋ1 – down* are used in the same contexts, three semantic dimensions are involved, that is, movement towards a higher or lower position, a change in quantity, and occurrence. The majority of the contexts where *khɨn3* is chosen as a translation of *up*, and *loŋ1* is chosen as a translation of *down*, have the sense of upward or downward movement. This agrees with the fact that vertical directions are the basic meanings shared by these directional terms.

## 5 Conclusion

In an attempt to study the semantics of vertical spatial terms in Thai in comparison with English, this work draws upon samples from corpora in order to obtain objective and naturalistic data. Meaning analyses of *khɨn3* and *loŋ1* in the Thai National Corpus, and *up* and *down* in the British National Corpus, show that there are overlapping senses in the pairs *khɨn3 – up* and *loŋ1 – down*. The senses involving movement towards a higher or lower position and accomplishment are frequently found in both languages. This reflects a universal image schema of vertical movement as well as similar processes of meaning expansion in Thai and English. Furthermore, the use of data from the parallel corpus, the English-Thai Parallel Concordance, allows us to examine the vertical spatial terms *khɨn3 – up* and *loŋ1 – down* in identical context. We have discovered that instances of *khɨn3* and *loŋ1* in Thai do not necessarily co-occur with their counterparts *up* and *down* in English. The mismatch can be explained

in terms of disparate linguistic structures in the two languages. Investigating which senses are shared when *khɨn3* appears in the same contexts with *up* and *loŋ1* with *down*, we have found that these terms mostly co-occur when they denote vertical movement. It should be noted this work is an unprecedented study that make use of a parallel corpus to explore vertical spatial expressions in Thai and English. Obviously, the parallel corpus enables us to make a clear and tangible cross-linguistic comparison.

The study of *khɨn3* and *loŋ1* in Thai along with *up* and *down* in English is a contribution to the body of work on vertical spatial terms across languages. Our future direction is to increase the number of samples used. In addition, since this work concerns mainly with the semantics of the vertical spatial terms, it will be helpful to include syntactic analyses in the future work.

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