CONCEPTUAL MAPPING MODEL ACROSS LANGUAGES:
A TEST IN VIETNAMESE LANGUAGE

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Abstract

The conceptual metaphor, LOVE IS A JOURNEY, has been identified as a process of mapping based on the Conceptual Metaphor Theory (CMT) proposed by Lakoff and Johnson (1980). However, Ahrens (2002) pointed out several problems that the CMT may encounter, especially in setting parameters to be experimentally tested. Ahrens (2002) proposed the Conceptual Mapping Model (CMM) to investigate metaphor expressions by identifying three mappings between the source domain and the target domain: entities, qualities, and functions. After an analysis, the reason for these mappings, called a mapping principle, is indicated. In particular, the CMM can predict the processing of conceptual metaphors in terms of conventional and novel metaphors. This study is intended to test whether the CMM can perform well across languages through the experimental rates of acceptability and interpretability for different types of metaphors. Fifty Vietnamese native speakers were recruited. Each participant judged (on a Likert scale of 1-7) the levels of acceptability and interpretability of three conceptual metaphors in Vietnamese: LIFE IS A BOOK, HAPPINESS IS LIGHT, and LOVE IS FIRE. Each conceptual metaphor consists of six types of sentences, including (a) Literal pair to B, (b) Conventional metaphor, (c) Literal pair to D, (d) Novel metaphor that follows the mapping principle, (e) Literal pair to F, and (f) Novel metaphor that does not follow the mapping principle. The results of t-tests show that in terms of both acceptability and interpretability, conventional metaphors are ranked higher than novel metaphors. The results also indicate that novel metaphors that follow the mapping principle are rated higher than those that do not. Therefore, the mapping principle can constrain the image schemas so that any image that does not belong to the schemas can affect the processing of metaphors.

Keywords: CMM; CMT; Conventional metaphor; Mapping principle; Novel metaphor.
1. INTRODUCTION

The Conceptual Metaphor Theory (CMT) (Lakoff, 1993; Lakoff & Johnson, 1980, 1999) has been considered to be central in identifying conceptual metaphors. This theory helps people understand linguistic expressions such as “his idea was half-baked” and “the teacher spoon-fed them the information.” According to the theory, these two expressions are the surface realizations of the underlying conceptual metaphor: IDEA IS FOOD. In CMT, the metaphor consists of two domains: a source domain (FOOD) and a target domain (IDEA) that are correspondent to each other. In a conceptual metaphor, concepts called image schemas are mapped between the source domain and the target domain. The conceptual metaphor, IDEA IS FOOD, can consist of many image schemas, such as components, preparation, taste, and fullness. Therefore, the CMT considers conceptual metaphors crucial because they indicate how abstract concepts are structured; moreover, they reflect how abstract and concrete concepts are organized and interrelated in our minds (Lai et al., 2009). In Nguyễn’s (2018) study, the CMT, with an adoption of blending theory (Fauconnier & Turner, 1996) at the final stage, was employed to compare the metaphorical implications of Presidents Barack Obama and Donald Trump in their inaugural speeches. The results indicate that a metaphor can be an accurate reflection of politicians’ beliefs, orientations, idealism, and political targets. It is of interest that Barack Obama, with his background as a law professor, prefers to metaphorically express his political beliefs of peace, liberty, human rights, and equality. Oppositely, being well known as a successful businessperson, Donald Trump tends to employ metaphorical images emphasizing the idealism of capitalism, competition, possession, and profit-making.

In spite of being considered “the most influential theory of metaphor” (Kövecses, 2011, p. 23), the CMT has been strongly criticized over the past years. Kövecses (2011) also indicated three distinct issues recapitulated from the perspectives of other linguistic critics. First, the adoption of CMT requires the practitioners to analyze metaphor intuitively (Boroditsky, 2000; Pragglejaz Group, 2007). Second, linguistic metaphors exist with highly irregular characteristics to which insufficient attention is still paid (Deignan, 1995, 1999; Kövecses, 2010). Third, it is claimed that the collections of metaphors are highly impoverished; therefore, traditional conceptual metaphors work with insufficient sets of data (Kövecses, 2010; Stefanowitsch, 2006).

Generally, although the CMT has improved “our understanding of the pervasiveness of metaphor in our language and cognitive system” (Ahrens, 2010, p. 185), the theory has focused on explaining “the underlying conceptual scenarios involved in conventional metaphors” (Lakoff, 1993, p. 206). Tsur (1999) also argues that since the CMT has expanded our understanding of the cognitive basis of conceptual metaphors, it leaves open criticism on metaphor understanding and interpretation. That is the rationale for researchers to propose various cognitive models with more precise sets of linguistics data with the aim of examining how speakers comprehend conventional and novel metaphors (Clausner & Croft, 1997; Grady, 1997).
The present study adopts a recent conceptual model called the Conceptual Mapping Model (CMM) proposed by Ahrens (2002). This model is one of the attempts to criticize the CMT and provides an explanation for how speakers comprehend both conventional and novel metaphors.

2. THE CONCEPTUAL MAPPING MODEL

Ahrens (2002) indicates several problems with the CMT. First, the theory allows numerous mappings between a source domain and a target domain. Therefore, the mappings can become arbitrary and automatic. Second, the model does not clearly distinguish correspondences from inferences. Rather, the CMT combines both into a general principle within a metaphorical context; consequently, it becomes difficult to set parameters to test the CMT. Thus, Ahrens (2002) argues that correspondences and inferences should be answered separately. For the former, she proposes the Conceptual Mapping Model to examine the lexical correspondences between a source domain and a target domain. CMM investigates metaphorical expressions by analyzing three mappings between source and target domain: entities, qualities, and functions. After the conventional metaphors are analyzed in terms of these three mappings, the reason for the mappings, which is called a mapping principle, is revealed. It can be seen that by separating correspondences from inferences, CMM helps in experimentally testing conceptual metaphors.

It is also argued by Ahrens (2002) that the CMM can explain why a target domain can correspond to various source domains. For example, she analyzed the mappings between the target domain (TD) of IDEA and its source domains (SD) of BUILDING, FOOD, COMMODITY, and INFANT. First, Ahrens (2002) answered three questions: (1) What entities does the SD have? (2) What qualities does the SD or the entity in the SD have? (3a) What does the SD do? (3b) What can subjects/objects do to or in the SD? Then, she indicated the probable explanations that underlie these source-target domain pairings. The CMM can also explain why a source domain can correspond to different target domains such as, for example, how the SD of FIRE contributes to the TDs of ANGER and LOVE.

To illustrate how the CMM works in the real world, Ahrens (2002) conducted several psychological experiments to judge how Chinese native speakers evaluate conventional and novel metaphors. One of the examples for the speakers to evaluate was the metaphorical expression:

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zhege lilun jiagou hen songsan
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"The framework of this theory is loose."

The conceptual metaphor employed in this expression is IDEA IS A BUILDING. After this conceptual metaphor is postulated, the three questions mentioned above are asked concerning what is known about each source domain in
terms of real-world knowledge. This knowledge is conceptual and can be expressed through (meta) linguistic expressions as follows (Ahrens, 2010, p. 188):

**Real world knowledge (about buildings)**

- **Q1. What entities does the source domain have?**
  
  [foundation, structure, base, model, layout, cement, brick, steel bar, sandstone, (bamboo) scaffolding, roof, wall, worker, window, door, plumbing, decoration]

- **Q2. What qualities does the source domain (or the entities in the source domain) have?**
  
  [shaky, high, short, strong, weak, flimsy]

- **Q3a. What does the source domain do?**
  
  [to protect, to shield, to shelter]

- **Q3b. What can someone do to (or in) the source domain?**
  
  [to live in, to build, to construct, to tear down]

The next step of this model is to determine whether the generated linguistic expressions are conventional or novel by eliminating the real-world functions of the entities used in the expression. Eventually, once the actual mappings have been analyzed, the correspondences that have been mapped are compared with what have been mapped. This is the step to identify the *mapping principle* of the metaphor, explaining why the metaphor is used in this case. For the example of IDEA IS A BUILDING, the mapping principle can be expressed as: “Ideas are understood as buildings, in that buildings involve a (physical) structure and ideas involve an (abstract) organization” (Ahrens, 2010, p. 189).

In general, the CMM can predict the processing of conceptual metaphors in terms of conventional and novel metaphors. As predicted, the result in Ahrens (2002) shows that the rates of acceptability and interpretability differ significantly between conventional and novel metaphors based on the mapping principles. This result reconfirms that the Conceptual Mapping Model is an accounts for the processing in the Conceptual Theory of Metaphor.

By adapting the framework that Ahrens (2002) employed, this paper is an attempt to investigate whether the CMM can perform across languages. Ahrens did the experiment in the Chinese context, and this paper is conducted in the Vietnamese context as a comparison to Ahrens’s. This paper also follows the experimental procedures proposed by Ahrens, which consist of two stages: a test of the acceptability rate and then a test of the interpretability rate for the metaphors. The results are predicted as follows: conventional conceptual metaphors are rated at the same level as
their literal pair, novel metaphors following the mapping principles are ranked lower, and novel metaphors not following the mapping principles are ranked even lower. Therefore, the study aims to answer the following questions.

In terms of acceptability and interpretability,

- If the mapping principle is followed, will conventional conceptual metaphors be ranked at the same level as literal sentences?
- Will the conventional metaphors be ranked differently from novel metaphors that follow the mapping principle?
- Will the novel metaphors that do not follow the mapping principle be rated differently from those following the mapping principle and from conventional metaphors?

3. EXPERIMENTAL SURVEYS

As mentioned above, the study consists of two experimental surveys: acceptability and interpretability for metaphors, which will be presented separately below.

3.1. Acceptability ratings of metaphors

3.1.1. Participants

Fifty Vietnamese native speakers were recruited for this study. All participants were at the undergraduate level or above and had acquired the language before the age of seven. Before taking the survey, they were required to rate their Vietnamese proficiency. All of them rated themselves 5 or above (scale 1-7), which was considered sufficient to be qualified for the survey.

The survey was conducted online via Google Forms. The participants had to read the instructions carefully beforehand and confirm their understanding by checking the box I understand the instructions. Everything was written in Vietnamese. The purpose of the study was first explained to the participants. To prevent them from being affected by the predictions of the study, they were not provided with the definitions of conventional and novel metaphors or of literal pairs to the metaphors. They were only instructed on how to rate the sentences from the native perspective.

3.1.2. Material

Three conceptual metaphors were used in this study: LIFE IS A BOOK, HAPPINESS IS LIGHT, and LOVE IS FIRE. Each metaphor was first analyzed, and its conceptual mappings and mapping principle were determined after a discussion between the author and a Vietnamese linguistics graduate student. The examples that were agreed upon in the discussion were used in the survey. Each conceptual metaphor contains one or more of the following six types of sentences:
A. Literal pair to B
B. Conventional metaphor
C. Literal pair to D
D. Novel metaphor that follows the mapping principle
E. Literal pair to F
F. Novel metaphor that does not follow the mapping principle.

- **Metaphor 1: LIFE IS A BOOK**

In this conceptual metaphor, the source domain is BOOK and the target domain is LIFE. First, the three questions proposed by Ahrens (2002) were investigated to find the actual mappings or correspondences that exist between LIFE and BOOK.

1. What entities does the SD have that are mapped to the TD? – Page, stage, chapter
2. What qualities does the SD or the entity in the SD have that are mapped to the TD? – Changing, damageable, delicate
3. What can S/O do to (or in) the SD that is mapped to the TD? – To turn, to change, to damage, to take care of, to understand

Therefore, the mapping principle for the metaphor, LIFE IS A BOOK, is as follows: *Life is understood as a book because books are divided into pages that can be changed and turned into a new one, and life is divided into stages that can be changed and turned into a new one.* The examples below were constructed based on the mapping principle.

1A. Cô ấy đã đọc sang trang mới.
   *She has read to a new page.*

1B. Cuộc đời cô ấy đã bước sang trang mới.
   *Her life has transferred to a new page.*

In this pair of sentences, 1A is the literal control of 1B, which is the conventional metaphor. It can be seen that the conventional metaphor is developed from its literal pairing. In this pair, a *page* of a BOOK corresponds to a *page* of LIFE. In Vietnamese, this kind of metaphor is used very frequently.
1C. Cuốn sách đã bị xé vần.
   CLASSIFIER book PAST-M. PASSIVE-M. tear to pieces
   The book was torn to pieces.

1D. Đời cô ấy đã bị xé vần.
   life she PAST-M. PASSIVE-M. tear to pieces
   Her life was torn to pieces.

1C and 1D create a pair in which 1C is the literal control of 1D. 1D is a novel metaphor that follows the mapping principle. In Vietnamese semantics, the verb xé vần only refers to the action of tearing paper to pieces, not any other material. In this pair, we can see that LIFE can be mentally torn and a BOOK can be physically torn. However, in the context of Vietnamese, this metaphor is very unusual. Thus, it is a novel metaphor that follows the mapping principle.

1E. Cuốn sách cần được biên tập lại trong tương lai.
   CLASS. book need PASSIVE-M. edit again in future
   The book needs to be edited in the future.

1F. Đời cô ấy nên được biên tập lại trong tương lai.
   life she should PASSIVE-M. edit again in future
   Her life needs to be edited in the future.

In this pair, 1E is the literal control of 1F. 1F is a very unusual metaphor in the Vietnamese language. It can be seen that 1F does not follow the mapping principle because it does not refer to turning a page of a BOOK or a stage of LIFE. Therefore, in this pair, 1F is a novel metaphor that does not follow the mapping principle.

• Metaphor 2: HAPPINESS IS LIGHT

This conceptual metaphor maps the source domain LIGHT to the target domain HAPPINESS.

Actual mappings/correspondences that exist between HAPPINESS and LIGHT:

1. What entities does the SD have that are mapped to the TD? – Brightness
2. What qualities does the SD or the entity in the SD have that are mapped to the TD? – Bright, upness, strong, weak
3. a. What does the SD do that is mapped to the TD? – To spread, to fade, to shine
b. What can S/O do to (or in) the SD that is mapped to the TD? – To turn on, to turn off, to cover, to hide

Mapping principle: Happiness is understood as light because light physically shines at different levels and happiness emotionally shines at different levels.

2A. Ngọn đèn ánh lên giữa màn đêm.  
CLASSIFIER lamp glisten up in the middle of darkness  
*The lamp is shining in the darkness.*

2B. Ánh mắt anh ấy ánh lên niềm hạnh phúc.  
Glint eye he glisten up CLASSIFIER happiness  
*His eyes are glistening with happiness.*

2A and 2B make up a pair in which 2A is the literal control of 2B. 2B is a conventional metaphor that follows the mapping principle. The verb ánh lên in Vietnamese refers to the action of glistening brightly. In this pair, we can see that both HAPPINESS and LIGHT can shine and can be recognized physically.

2C. Ngọn đèn leo lét trong màn đêm.  
CLASSIFIER lamp shine faintly in darkness  
*The lamp is shining faintly in the darkness.*

2D. Hạnh phúc tôi leo lét trong màn đêm.  
happiness I shine faintly in darkness  
*My happiness is shining faintly in the darkness.*

Example 2C is the literal control of 2D. In terms of Vietnamese semantics, the adjective leo lét refers to the state of shining faintly and being about to stop at any time. It should be noted that in Vietnamese this is a very unusual adjective to describe HAPPINESS. Therefore, 2D is a novel metaphor that follows the mapping principle.

2E. Ánh sáng sẽ khúc xạ thời.  
light FUTURE-M. refract eventually  
*The light will be refracted eventually.*

2F. Hạnh phúc ai cũng sẽ khúc xạ thời.  
happiness whoever also FUTURE-M. refract eventually  
*Whoever’s happiness will also be refracted eventually.*

Example 2E is the literal sentence of 2F. 2F is an example of a novel metaphor that does not follow the mapping principle because the linguistic expression khúc xạ is
such an unusual word to refer to HAPPINESS. Moreover, it does not refer to the action of shining; hence it can be considered a novel metaphor that does not follow the mapping principle.

- **Metaphor 3: LOVE IS FIRE**

This is a conceptual metaphor with the source domain FIRE and the target domain LOVE.

Actual mappings/correspondences that exist between LOVE and FIRE:

1. What entities does the SD have that are mapped to the TD? – *Burning part, heat, warmth*
2. What qualities does the SD or the entity in the SD have that are mapped to the TD? – *Hot, warm, sparkling*
3. a. What does the SD do that is mapped to the TD? – *To burn, to shine, to melt*
b. What can S/O do to (or in) the SD that is mapped to the TD? – *To set up, to heat up, to light up, to warm up, to put out, to fade*

Mapping principle: Love is understood as fire because fire involves burning with physical light and warmth, and love involves giving emotional light and warmth.

3A. Lửa đã đốt cháy khu rừng.
   *fire PAST-Marker burn forest*
   *The fire has burned the forest.*

3B. Tình yêu đã đốt cháy trái tim cô ấy.
   *love PAST-Marker burn heart she*
   *Love has burned her heart.*

Example 3A is the literal control of 3B. In Vietnamese semantics, the verb đốt cháy is used to refer to love in a positive manner. It implies that to be in love is to be in a state of euphoria. This is clearly the conventional metaphor of 1B.

3C. Làn khói từ bếp lửa bay lan trong không trung.
   *CLASSIFIER smoke from kitchen fire fly mix in atmosphere*
   *The smoke from the fire in the kitchen is flying in the air.*

3D. Làn khói tình yêu bay lăn trong không trung.
   *CLASSIFIER smoke love fly mix in atmosphere*
   *The smoke of love is flying in the air.*
The pair of 3C and 3D provide an example of the image of smoke, which is the correspondence between LOVE and FIRE. Smoke is generated from fire. However, in Vietnamese semantics, it is very weird to use smoke to refer to love. Therefore, 3D is a novel metaphor that follows the mapping principle.

3E. Lửa nấu chín mọi thứ.
         fire cook through everything

_Fire cooks through everything._

3F. Tình yêu cô ấy đã nấu chín tâm hồn anh.
love she PAST-Marker cook soul he

_Her love has cooked through his soul._

3E is the literal control example of 3F. As we can see in the answer to question 3b, there is no action of cooking that can be mapped between the SD and the TD even though the verb cook can be totally fine with the actual concept of the SD only. Moreover, it is very unusual to use the verb cook to talk about love in the Vietnamese language. Therefore, 3F is an example of a novel metaphor that does not follow the mapping principle.

3.1.3. Procedures

Each participant was required to judge in total 18 sentences that are examples of the three conceptual metaphors mentioned above. Below each sentence were seven boxes corresponding to the scale of 0 to 7. If the participants thought the sentence was totally acceptable in the real context, then they should rate the sentence as 7. The level of acceptability gradually reduces to 0, which implies the sentence is completely unacceptable in any context. The data collected from the survey were then analyzed with the aid of statistics.

3.1.4. Results

Table 1 provides the means and standard deviations of the six sentence types across all subjects.

It can be seen from Table 1 that the conventional metaphor B and its paired literal sentence A are almost rated at the same level of acceptability (6.3 vs. 6.2). Moreover, the mean of the novel metaphor that follows the mapping principle is much lower than its literal sentence (3.5 vs. 6.2), and the mean of the novel metaphor that does not follow the mapping principle is rated at an even lower level of acceptability than its literal sentence (2.8 vs. 5.5). As an overall trend, the rates for the sentence types decline from conventional metaphor (6.3) to novel metaphor that follows mapping principle (3.5) to novel metaphor that does not follow mapping principle (2.8).
### Table 1. Means for acceptability ratings of literal and metaphorical sentences

| Condition                                      | Mean | Standard deviation |
|------------------------------------------------|------|--------------------|
| A (literal pair to B)                          | 6.2  | 1.0                |
| B (conventional metaphor)                      | 6.3  | 0.9                |
| C (literal pair to D)                          | 6.2  | 1.0                |
| D (novel metaphor that follows the mapping principle) | 3.5  | 1.8                |
| E (literal pair to F)                          | 5.5  | 1.4                |
| F (novel metaphor that does not follow the mapping principle) | 2.8  | 1.6                |

A paired t-test was applied to find whether the difference is significant between a metaphor and its paired literal sentence. The result shows that the conventional metaphors A are not significantly different from their literal pairs B, $t(49) = -0.73, p = 0.46$. The novel metaphors D that follow the mapping principle are significantly different from their literal sentences C, $t(49) = 11.68, p < .001$. The novel metaphorical sentences F that do not follow the mapping principle do significantly differ from their literal sentences E, $t(49) = 10.89, p < .001$.

Furthermore, a comparison was conducted between the three metaphorical sentences. The result shows that there is a significant difference between the conventional metaphorical sentences B and the novel metaphors D that do not follow the mapping principle, $t(49) = 9.23, p < .001$. In addition, a significant difference is found between the novel metaphors D that follow the mapping principle and the novel metaphors F that do not follow the mapping principle, $t(49) = 3.85, p < .001$.

### 3.2. Interpretability ratings of metaphors

The above survey examined the level of acceptability of each subject to the different types of metaphor. In this second survey, the same participants as in survey 1 were asked to judge the level of interpretability of the same 18 sentences used above. The procedures of this survey were exactly the same as those of survey 1. It should be noted here that before the participants started the second survey, they had to read the instructions carefully to ensure they could distinguish acceptability from interpretability. The evaluation scale in this survey also ranged from 1 to 7.

- **Results**

Table 2 provides the means and standard deviations of the six sentence conditions across all participants.

It can be seen from Table 2 that the conventional metaphorical sentences B and their paired literal sentences A are ranked at almost the same level of interpretability (6.4 vs. 6.6). However, the mean of sentence type D is lower than its literal control C (4.3 vs. 6.5). Moreover, the novel metaphorical type F has a much lower mean than its literal sentence E. To confirm whether the differences between them are significant, a
paired t-test was employed. The result shows that there is no significant difference between the literal sentences A and the conventional metaphors B, \( t(49) = 1.53, p = 0.13 \). In addition, the result shows a significant difference between the literal sentences C and the novel metaphors D that follow the mapping principle, \( t(49) = 10.71, p < .001 \). The literal sentences E are also found to be significantly different from the novel metaphorical sentences F that do not follow the mapping principle, \( t(49) = 9.73, p < .001 \).

### Table 2. Means for interpretability ratings of literal and metaphorical sentences

|                                | Mean | Standard deviation |
|--------------------------------|------|--------------------|
| A (literal pair to B)          | 6.6  | 0.8                |
| B (conventional metaphor)      | 6.4  | 0.8                |
| C (literal pair to D)          | 6.5  | 0.8                |
| D (novel metaphor that follows the mapping principle) | 4.3  | 1.6                |
| E (literal pair to F)          | 6.2  | 1.0                |
| F (novel metaphor that does not follow the mapping principle) | 3.8  | 1.8                |

Another comparison was conducted to confirm whether there were any significant differences among the three types of metaphor. The result indicates that there is a significant difference between the conventional metaphors B and the novel metaphors D that follow mapping principle, \( t(49) = 10.69, p < .001 \). In addition, the novel metaphorical sentences D are also significantly different from the novel metaphorical sentences F that do not follow the mapping principle, \( t(49) = 3.64, p < .001 \).

### 4. DISCUSSION AND CONCLUSION

The results for both acceptability and interpretability reconfirm the predictions of the Conceptual Mapping Model proposed by Ahrens (2002). Especially, the findings also reveal the applicability of the CMM across languages. In general, we can see that conventional metaphors are ranked higher than novel metaphors. Within the types of novel metaphor, it is shown that novel metaphors that follow the mapping principle are rated higher than those that do not follow the mapping principle. This result confirms why the mapping principle is important in conceptual metaphor processing. Based on the examination of the linguistic evidence, such as entities, qualities, and functions, the model can generate the underlying reason, which is called the mapping principle, for the existing correspondences. We see that the mapping principle can constrain the image schemas so that any image that does not belong to the schemas can affect the processing of metaphors.

However, this study has some limitations. First, the materials for the surveys are the key to the success of the study. Regrettably, some examples in the materials are not really representative for the CMM. More time is needed for further discussion with more native speakers who have been trained about metaphorical models. Even though the CMM is clearly presented in Ahrens (2002), it is still not easy to determine the mapping principles between the SD and the TD. Moreover, the pairs of examples in the
material are not syntactically similar; therefore, it still cannot be determined whether syntactical structures may be a factor affecting the judgment of participants toward different types of metaphor. Nevertheless, the study is an attempt to investigate an interesting phenomenon in psycholinguistics in a different context. The result was found to be as predicted, which somehow implies the potential of the study.

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