

# When Love Is Not Digested: Underlying Reasons for Source to Target Domain Pairings in the Contemporary Theory of Metaphor

Kathleen Ahrens

National Taiwan University

---

## Abstract

The goal of this paper is to present a processing account (the Conceptual Mapping Model) for the Contemporary Theory of Metaphor (Lakoff and Johnson 1980) and to present experimental evidence that supports this model. In particular, I will point out that the conceptual correspondences between a source and target domain must be analyzed in order to determine the underlying reasons for the source-target pairings. This underlying reason is formulated in terms of a Mapping Principle. Once this principle is discovered, predictions may be made concerning the acceptability of both conventional and novel metaphors.

Key Words: Conceptual Metaphor, Mapping Principle, Metaphor Processing

## 1. Introduction

Current understanding of metaphors within the Contemporary Theory of Metaphor has centered on identifying conceptual metaphors in a particular language, such as the following metaphors in English: TIME IS UNDERSTOOD AS MONEY, LIFE IS A JOURNEY, GOOD IS UP, BAD IS DOWN, etc. (Lakoff and Johnson 1980). These are metaphors that map one conceptual domain (i.e. MONEY) onto another (i.e. TIME). Conceptual metaphors contrast with image metaphors, which map only one visual image onto another visual image. An example of an image metaphor is: 'her waist is an hour-glass,' where the visual image of the shape of an hour-glass is mapped onto a waist. Image metaphors are 'one-shot' deals, unlike conceptual metaphors that allow *many* concepts in the source domain to be mapped onto corresponding concepts in the target domain. The concepts that are mapped in conceptual metaphors are called image-schemas. For example, in the conceptual metaphor

LIFE IS A JOURNEY we find the following metaphorical usages in English, as in (1).

- (1a) He's cruising down the highway of success.
- (1b) You'd better slow down and think about what you want to do with your life.
- (1c) She lives her life in the fast lane.

All these examples have to do with the image-schema of *speed*. *Speed* in the source domain of JOURNEY relates to the speed at which the journey (usually in a vehicle) takes place. This image-schema of *speed* in the source domain corresponds to the *speed* at which LIFE takes place.

Lakoff (1993) proposes the Invariance Principle to guarantee that the mapping is consistent in the both the source and target domain. The Invariance Principle states:

Metaphorical mappings preserve the cognitive topology (that is, the image-schema structure) of the source domain, in a way that is consistent with the inherent structure of the target domain. (p. 215)

Thus, given the Invariance Hypothesis, *speed* could not map onto the *direction* that one is going in the LIFE IS A JOURNEY metaphor. *Direction* is a different image-schema that exists in a JOURNEY and may or may not map onto LIFE in the LIFE IS A JOURNEY metaphor. In fact, *direction* in journey corresponds to the direction in life; in either case one may be going in the wrong or the right direction.

Lakoff (1993) looks at two main questions concerning metaphors and phrases them with specific reference to the LOVE IS A JOURNEY metaphor.

Is there a general principle governing how these linguistic expressions about journeys are used to characterize love?

Is there a general principle governing how our patterns of inference about journeys are used to reason about love when expressions such as these are used?

The answer to both is yes. Indeed, there is a single general principle that answers both questions, but it is a general principle that is neither part of the grammar of English, nor the English lexicon. Rather it is part of the conceptual system underlying English....[It] can be stated informally as a metaphorical scenario:

The lovers are travelers on a journey together, with their common life goals seen as destinations to be reached. The relationship is their vehicle, and it allows them to pursue those common goals together. The relationship is seen as fulfilling its purpose as long as it allows them to make progress toward their common goals. The journey isn't easy. There are impediments, and there are places (crossroads) where a decision has to be made about which direction to go in and whether to keep traveling together. (Lakoff 1993, pg. 206)

There are several problems with allowing a general principle governing linguistic expressions and patterns of inference to be united and stated as a metaphorical scenario. First, it allows an infinite number of mappings to exist between a source and a target domain. This is, to my mind, one reason that cognitive semantic work in metaphor is viewed by some as *ad hoc*. In addition, it blurs the line between correspondences and inferences by combining the two questions into a general principle understood within a metaphorical scenario.<sup>1</sup> Blurring the line between correspondences and inferences in turn means that it is difficult to set parameters to test the CTM, since inferring information from a conceptual structure (such as journeys) is a process that can only occur after one has *accessed* that conceptual structure.

Thus, we propose that the two questions should be answered separately. The first question should be answered by examining the lexical correspondences that exist between a source and target domain. We propose a Conceptual Mapping Model that analyzes the linguistic expressions that are used metaphorically in terms of the entities, qualities and functions that can map between a source and a target domain. When these conventionalized metaphorical expressions have been analyzed, an underlying reason for these mappings can then be postulated. This reason, called a Mapping Principle, can furthermore be experimentally tested in both off-line and on-line studies.<sup>2</sup>

In addition to overcoming the two problems mentioned above, the CM Model also has several advantages that the CTM as currently formulated does not have. First, the CM Model allows one to analyze why a target domain selects different source domains. We will discuss below, for example, why IDEA selects the source domain of BUILDING, FOOD, COMMODITY and BABY. Mapping principles will identify the probable explanations underlying these source-target domain pairings. These can be framed at a linguistic level based on an analysis of the conventional mappings between the source and target domain.

Moreover, the CM Model allows one to determine what different conceptual aspects a particular source domain contributes to different target domains. We will discuss below, for example, how our model explains why and how the source domain of FIRE maps to the different target domains of ANGER and LOVE.

Lastly, the CM Model allows for empirical predictions to be made concerning conventional and novel metaphors. Previous experiments on the CTM used metaphors that did not follow a mapping principle (McGlone 1996). However, we will show below that

---

<sup>1</sup> A correspondence is a linguistic expression such as ‘speed’ while an inference is the fact that if one is traveling in a car at fast speed, then distance is covered more quickly.

<sup>2</sup> The question of whether inferences should be analyzed at a linguistic or conceptual level we leave open for further study.

mapping principles can adequately account for speaker intuition concerning *conventional* conceptual metaphors that follow an MP, *novel* conceptual metaphors that follow an MP, and novel metaphors that do *not* follow an MP.

In sum, the Conceptual Mapping Model strengthens the falsifiability level of the CTM because it uses linguistic analysis to set forth hypotheses that can then be tested with psycholinguistic experiments.

## 2. The Conceptual Metaphor Model

### 2.1 TARGET DOMAIN OF IDEAS

Our proposal is that by analyzing the image-schemas that map for a certain conceptual metaphor, we will be able to postulate the underlying reason why a particular target has selected a particular source domain. We will state this underlying reason in terms of a Mapping Principle (MP). We use the following paradigm in collecting and analyzing our data. We will explain this paradigm by analyzing the conceptual metaphor IDEA IS BUILDING in Mandarin Chinese.<sup>3</sup>

#### 2.1.1 IDEA AS BUILDING

First we generate on the basis of native speaker intuition all examples within a proposed target domain, in this case IDEA. Second, the examples are grouped according to the similarity of their source domains. We have grouped the examples below into the following four source domains: BUILDING, FOOD, COMMODITY and INFANT.<sup>4</sup> Third, we ask ourselves three questions concerning what we know about each source domain in terms of our real world knowledge. This real world knowledge is conceptual. However, we are able to express our conceptual knowledge through the (meta) linguistic expressions as used below in (2).

#### (2) Real world knowledge about buildings

1. What entities does the SD have?  
foundation, structure, base, model, layout, cement, brick, steel bar,  
sandstone, scaffolding, roof, wall, worker, window, door, plumbing, decoration
2. What qualities does the SD or the entity in the SD have?  
-- shaky, high, short, strong, weak, flimsy
- 3a. What does the SD do?

---

<sup>3</sup> By Mandarin Chinese we are referring to the Mandarin that is currently spoken in Taiwan.

<sup>4</sup> An additional source domain of FASHION was also found. We do not present the analysis here because of space limitations, and also because the mappings are limited in comparison with the other four source-target domain pairings.

-- to protect, to shield, to shelter

b. What can S/O do to or in the SD?

-- to live in, to build, to construct, to tear down

Fourth, we look at the linguistic expressions generated and ask ourselves if they are conventional or novel. Five native speakers must agree that the examples are conventional usages (examples 3a-h). The entities that correspond between the source and target domains are 架構 *jiagou* ‘frame’ (3a), 根基 *genji* ‘base’ (3b), 模型 *moxing* ‘model’ (3c), 雛形 *cuxing* ‘miniature’ (3c), and 格局 *ge ju* ‘layout’ (3d), while the quality that corresponds between the source and target domains is 鬆散 *songsan* ‘loose’ as in (3a).

(3a) 這個 理論 架構 很 鬆散。  
*zhege lilun jia gou hen song san*  
this theory frame very loose  
‘The framework of this theory is loose.’

(3b) 你的 論點 根基 是 什麼？  
*nide lun dian gen ji shi sheme*  
your argument base be what  
‘What is the foundation of your argument?’

(3c) 我的 這個 想法 才 稍 具 模型/ 雛型  
*wo de zhege xiangfa chi shao ju moxing/ cuxing*  
my this idea just slightly have model/ miniature  
‘My idea is only beginning to take shape.’

(3d) 這個 想法 的 格局 太 小 了  
*zhege xiangfa de geju tai xiao le*  
this idea de layout too small PRT  
‘The layout of this idea is too small.’

The functions that correspond between the source and target domains are 建構 *jiangou* ‘build’ (3e), 解構 *jiiegou* ‘deconstruct’ (3f), 成形 *chengxing* ‘take shape’ (3g), and 動搖 *dongyao* ‘shake’ (3h).

(3e)這 群 文 人 正 努力 建構 一 套 理論。  
*che qun wenren zheng nuli jiangou i tao lilun*  
this group scholar at the present work hard build one set theory  
'This group of scholars is working hard at constructing a theory.'

(3f)我們 想 辦法 去 解構 這個 理論。  
*women xiang ban fa qu jie gou zhe ge lilun*  
we think method go deconstruct this one theory  
'We're thinking of a way to deconstruct this theory.'

(3g)他的 思想 架構 快 成形 了。  
*tade sixiang jiagou kuan cheng xing le*  
his thought framework soon taking shape ASP  
'His thought's framework is taking shape.'

(3h)他的 想法 開始 動搖  
*tade xiangfa kaishi dongyiao*  
his idea begin shake  
'His idea has begun to waver.'

Fifth, the examples are analyzed for linguistic expressions that are the image-schematic correspondences between the source and target domains (4). These actual mappings are a subset of the correspondences that exist in the real world.

#### **(4) Actual mappings/correspondences that exist between IDEA and BUILDING**

1. What entities does the SD have that are mapped to the TD?  
-- foundation, base, model, layout, e.g. (3a), (3b), (3c) & (3d)
2. What qualities does the SD or the entity in the SD have that are mapped to the TD?  
-- loose, shaky, e.g. (3a)
- 3a. What does the SD do that is mapped to the TD?  
-- none
- b. What can S/O do to (or in) the SD that is mapped to the TD?  
-- to construct, to deconstruct, to shape up, e.g. (3e), (3f) , (3g) & (3h)

Once the actual mappings have been analyzed, then we look for what correspondences have been mapped in the case of the conceptual metaphor as compared with what could have been mapped (i.e. in the case of real world knowledge). From the analysis in (4) above, we can see that expressions relating to the concept of foundation, stability and construction were mapped.

Concepts relating to position of the building, internal wiring and plumbing, the exterior of the building, windows and doors were not mapped. Thus we postulate that the target domain of IDEA uses the source domain of BUILDING in order to emphasize the concept of structure. Buildings can stand because of a foundation and a well-built stable structure. Ideas have deemed worthy if they also have a good basis and structure. Thus, when we talk about ideas and want to express positive notions concerning organization, we use the source domain of BUILDING to help us express this idea. Our Mapping Principle in this case is therefore the following:

(5) Mapping principle for IDEA IS BUILDING:

Idea is understood as building because **buildings involve a (physical) structure and ideas involve an (abstract) structure.**

At this point, we can make the following hypothesis (6):

(6) Mapping Principle Constraint: A target domain will select only source domains that involve unique mapping principles.

This principle says that target domains will never have a pairing with a source domain which would involve a mapping principle similar to one that already exists. So, for example, when we look next at the source domains of FOOD, COMMODITY and INFANT, the Mapping Principle Constraint predicts that the target domain of IDEA will use each of these source domains for a different reason. These source domains will express something about IDEA other than structure.

### 2.1.2 IDEA IS FOOD

In what follows, we will not present the entire analysis process for each metaphor in the interest of saving space, although we have done the complete analysis for each source-target pairing. We will simply present the conventional usages that our analysis uncovered and point out the entities, qualities and functions of each source-target domain pairing. Then we will give our analysis of the underlying mapping principle.

For example, IDEA IS FOOD is the second productive metaphor for the IDEA target domain. The entities that correspond between the source and target domains are 料 *liao* 'ingredient' (7a), 餿主意 *souzhuyi* 'rotten idea' (7b).

(7a) 這 場 演 說 沒 什 麼 料  
*zhe chang yianshuo meisheme liao*  
this CL speech nothing ingredient  
'There was no real meat in this speech.'

(7b) 你 別 再 出 餿 主 意 了  
*ni bie zai chu sou zhuyi le.*  
you not again make rotten idea ASP  
'Don't give another lousy idea.'

The qualities that corresponds between the source and target domains 倒胃口 *daoweikou* 'spoil appetite' (7c), 回味無窮 *huiweiwuqiong* 'aftertaste' (7d), 津津有味 *jinjinyuwei* 'with appetite and relish' (7e), 索然無味 *suoranwuwei* 'no flavour' (7f), and 飽 *bao* 'full' (7g).

(7c) 這 種 大 男 人 主 義 的 想 法 真 令 人 倒 胃 口  
*zhe zhong da nianren zhu i de xiangfa zhen ling ren daoweikou*  
this kind big man ideology MOD thought real make man spoil appetite  
'This misogynist's idea disgusts me.'

(7d) 他 的 話 真 令 人 回 味 無 窮  
*tade hua zhen lin ren huiweiwuqiong*  
his word real make people aftertaste endless  
'His words are so profound that I keep thinking them over.'

(7e) 他 看 漫 畫 看 得 津 津 有 味  
*ta kan manhua kan de jinjinyuwei*  
he read comic book read COM with appetite and relish  
'He reads the comic books with great interest.'

(7f) 這 個 演 講 聽 來 索 然 無 味  
*zhege yan jiang ting lai suoranwuwei*  
this speech sound come simply no flavour  
'This speech sounds boring.'

(7g) 他 是 個 飽讀詩書 的 人  
*ta shi ge baodushishu de ren*  
he is a fully read books de person  
'He is a learned person.'

The functions that correspond between the source and target domains are 咀嚼 *jujue* 'chew' (7h), 品嚐 *pinchang* 'taste' (7h), 反芻 *fanchu* 'ruminate' (7i), 消化 *xiaohua* 'digest' (7j), 囫圇吞棗 *huluntunzao* 'read without comprehension' (7j), 咬文嚼字 *yiaowenjiaozi* 'talk pedantically' (7k), 吸收 *xishou* 'absorb' (7l).

(7h) 我 細細 咀嚼/ 品嚐 他的 話  
*wo xixi jujue pinchang tade hua*  
I carefully chew/ taste his words  
'I think over his words thoroughly.'

(7i) 我 回 家 後 再 仔細 反芻 老師 上課 的 內容  
*wo hui jia hou zai zixi fan chu laoshi shangke de neirong*  
I come home back again carefully ruminate teacher class MOD content  
'After coming home, I ruminated the content of the class.'

(7j) 讀 一 本 書 要 消化 裡面 的 想法 , 不要  
*du yi ben shu yao xiaohua limian de xiangfa, buyao*  
read one CL book need digest inside MOD thought don't

囫圇吞棗

*huluntunzao*

swallow dates whole

'When you read a book, you have to digest the thought in it. Don't read without comprehension.'

(7k) 他 很 喜歡 咬文嚼字  
*ta hen xihuan yiaowenjiaozi*  
he very like bite article chew word  
'He likes to talk pedantically.'

- (71) 讀書 是 吸收 新 知 的 好 方法  
*dushu shi xishou xin zhi de hao fangfa*  
read is absorb new knowledge de good method  
'Reading is good method to absorb new knowledge.'

The majority of the examples deal with the notion of either enjoyment in the process of eating (i.e. deliciousness versus tastlessness) or eating and digestion. The fact that the emphasis in the conventional examples is on the eating and digestion of food, with the notion of enjoyment an accompanying aspect of the eating of food, allows us to postulate the following mapping principle (8).

- (8) Mapping principle for IDEA IS FOOD: Idea is understood as food because food **involves being eaten and digested (by the body) and ideas involve being taken in and processed (by the mind).**

Thus, our mapping principle reflects the notion of eating and digestion, but does not include other aspects of the food source domain such as preparation. However, Su (2000) gives an example of where the formation of thought is the preparation of food (9). This example does not follow our mapping principle because it has to do with the *preparation* of food.

- (9) 中央 研究院 的 院務會議 已在 醞釀 一個  
*zhongyan yanjiouyuan de yuanwuhueiyi yi zai yige*  
Academia Sinia De meeting already ferment a  
  
新的 議案  
*xin de yian*  
new De proposal

'Academia Sinica has held a meeting, trying to come up with a new proposal.'

In this type of case we need to evaluate whether or not the metaphorical expression falls within the delimited source domain, and if so, if there are additional examples. In this case, 醞釀 *yunniang* 'ferment' falls outside the source domain of FOOD, since it can only refer to the fermentation of liquor.<sup>5</sup> Thus, it is not part of the image-schematic mappings that exist

---

<sup>5</sup> We have dealt with cases, however, where there are conventional examples that are part of the source domain that do not follow the mapping principle. We need to do further research to analyze this phenomenon, but our preliminary analysis shows that such instances can be explained by one of two reasons: first, it is an image-schematic mapping that is always mapped from a particular source domain to all its paired target domains. Or second, it is an image-schematic mapping that is shared by several different source domains (i.e. *dui-shou*

between the source and target domains of FOOD and IDEAS respectively. However, depending on the productivity of the mappings, there could be an additional conceptual metaphor of AN IDEA IS LIQUOR/DRINK.

### 2.1.3 IDEA IS A COMMODITY

Ideas are also understood in terms of commodities in Mandarin Chinese. The entity that correspond between the source and target domains in IDEA IS A COMMODITY metaphor is 賣點 *mai dian* ‘selling point’ in (11a).

- (11a) 他的 想法 很 有 賣點  
*tade xiangfa hen yiu maidian*  
his idea very have selling point  
‘His idea has a very high market value.’

The quality that corresponds between the source and target domains is 一文不值 *iwenzuzhi* ‘not worth a penny’ as in (11b).

- (11b) 這 種 看法 一文不值  
*zhe zhong kanfa iwenzuzhi*  
this kind viewpoint not worth a penny  
‘This kind of viewpoint has no worth.’

The functions that correspond between the source and target domains are 賣 *mai* ‘sell’ (11c), 推銷 *tuixiao* ‘promote’ (11d), 包裝 *baozhung* ‘package’ (11d), 丟棄 *diuqi* ‘throw away’ (11e).

- (11c) 這個 點子 將會 大 賣  
*zhege dianzi jianghui da mai*  
this ideas will big sell  
‘This idea will be in great demand.’

---

‘competitor’ is a concept that is used by the source domains of WAR and COMPETITION). However, we would like to emphasize neither of these explanations should not be considered *ad hoc* stipulations. They can only be used when all source-target domain pairs for either a particular source or target have been examined and analyzed.

(11d) 這個 作者 在 他的 書 裡 推銷 性 開放 的 觀念  
zhege zuozhe zai tade shu li tuixiao xing kaifang de guannian  
this author in his book in promote sex open MOD viewpoint

一般 讀者 看 不出 來，因為 作者 包裝 得 很  
i ban duzhe kan bu chu lai, yinwei zuozhe baozhung de hen  
general reader see no out come because author package COM very

巧妙。

qiaomiao

skillful

‘Most readers don’t realize that the author is promoting open attitude toward sex in this book.’

(11e) 陳舊 的 老 觀念， 我們 丟棄 不 用 了  
chenjiu de liao guan nian wo men diuqi bu yong le  
out of date MOD old idea, we throw away not use ASP  
‘We have thrown away this all-too-old idea.’

In this metaphor, the function mappings involving marketing and selling are the most productive, and the quality and entity mappings both have to do with the notion of value as related to marketing. Therefore we postulate the mapping principle as in (12) below.

(12) Mapping principle for IDEA IS COMMODITY: Idea is understood as a commodity because **a commodity is (a valuable) to be marketed and an idea (a valuable) to be marketed.**

The reason the target domain of idea has selected the source domain of commodity is because it wants to get across the notion that ideas can be bought and sold, that they have value. The last example, where a commodity is thrown away looks like a potential counter-example, but it fits in with the notion of marketing as well. If a commodity is old, it can no longer be marketed and must be thrown out.

#### 2.1.4 IDEA IS AN INFANT

The quality that corresponds between the source and target is 成熟 *chengshou* ‘mature’ as in (13a).

(13a) 這個 想法 還 不 大 成熟  
zhege xiangfa hai bu ta chengshou  
this one thought still no much mature  
'This idea is still a raw idea.'

The functions that correspond between the source and target domains are 夭折 *yaozhe* 'end prematurely' (13b), 難產 *nanchan* 'dystocia' (13c), 胎死腹中 *taisifuzhong* 'die in belly' (13d), and 誕生 *dan sheng* 'born' (13e).

(13b) 這個 提案 半 路 夭折 了  
zhege tian ban lu yaozhe le  
this proposal half road end prematurely ASP  
'This propoasa ended prematurely.'

(13c) 我的 論文 難產  
wode lunwen nanchan  
my thesis dystocia  
'I have difficulty in producing my thesis.'

(13d) 這個 提議 胎死腹中 了。  
zhege tiyi taisifuzhong le  
this proposal die in belly ASP  
'This proposal died half way.'

(13e) 一個 偉大的 想法 終於 誕生了  
yi ge wei da de xian fa zhong yu dan sheng le  
one CL great DE idea finally born ASP  
'A great idea is finally being born.'

The target domain of IDEA uses the concept of INFANT, specifically a fetus that is gestating in his/her mother's womb. This baby will develop eyebrows in the womb and will become viable (mature) enough at some point to live outside the womb. In addition, the baby must go through the birthing process which may or may not be successful. The mapping principle is given in (14).

(14) Mapping principle: Idea is understood as an infant because **infants are physical beings that are born and ideas are abstract entities that are born.**

Thus, we can see that the target domain of IDEA uses the conceptual structure of four

source domains in Mandarin Chinese: BUILDING, FOOD, COMMODITY and INFANT. The target domain of IDEA selects the four source domains for different reasons. IDEA uses the source domain of BUILDING to borrow conceptualizations of structure; it uses the source domain of FOOD to borrow notions of intake and digestion, it uses the source domain of COMMODITY to express concepts of value and marketing, and the source domain of INFANT to conceptualize the birthing process. We have stated these reasons above in terms of mapping principles. Note that our constraint on the target domain restricted the reasons for mapping to be unique. It could be argued that the source domains of INFANT and COMMODITY could both involve a similar notion of creation or production when talking about real world knowledge. However, from the examples it is obvious that the emphasis in the COMMODITY domain is on concepts of quality, value, and marketing, (as opposed to production) while in the INFANT domain the concepts have to do with the birthing process (as opposed to the procreation process). That is why we feel it is critical to examine the entities, qualities and functions that are mapped. It is only when these correspondences are investigated at a lexical level that the underlying reasons for the source-target domain pairings become apparent.

Examining the correspondences in this way also allows for clear-cut predictions concerning 1) processing and 2) novel use of these source-target domain pairings. In terms of processing, the prediction is that conventional conceptual metaphors (i.e. exemplars that follow the mapping principle and are common in the language) will be treated on par with literal language. Next, metaphors that follow the mapping principle but are novel usages will receive slightly lower acceptability ratings and slightly higher processing times. Lastly, novel metaphors that do not follow the mapping principle will involve even lower acceptability ratings and even higher processing times.

In addition, we predict that novel uses of metaphors in speech and literature will be in line with the mapping principles proposed. For example, in the Robert Frost's poem 'The Road not Taken', the conceptual metaphor is 'Life is a Journey', and the postulated mapping principle for English is 'Life is a journey because journey take a person through time and space and life takes a person through time and space' (Ahrens and Sung 2001). Frost uses 'traveler' to describe the person making a choice. He talks about the road being 'grassy and want[ing] wear' which is a quality of the road suggesting that it has been infrequently traveled. He talks about two roads 'diverging' indicating that he needs to make a choice. In all these instances, the mappings are novel, but yet they follow the mapping underlying the source and target domain pairing. We predict that novel uses that do not following the mapping principle (in this case, for example, the notion of gift shops would be an entity in the source-target domain pairing that doesn't follow the mapping principle) will occur much less frequently. Of course, in poetry especially, a novel usage that does not follow the

mapping principle could be used to sustain a particular effect. In such an instance, however, the effect would be marked and obvious to the reader, while novel metaphors that follow the mapping principle, such as in the Frost poem above, are used without such a marked effect.

## 2.2 Source Domains

In the last section, we looked at how the target domain of IDEA used aspects of different source domains in order to express different notions about IDEAS. In this section, we look at how source domains can contribute different aspects of themselves to target domains. We will focus on the source domain of FIRE which can map to (or correspond with) the target domains of LOVE and ANGER. We go through the same analytical process as described above, looking at each individual source-target domain pairing and then compare what each target domain has used from each source domain.

### 2.2.1 LOVE IS FIRE

The entities that correspond between the source and target domains in LOVE AS FIRE metaphor are 烈焰 *lie yan* ‘fierce fire’ (15a), 愛火 *aihuo* ‘fire of love’ (15b), and 火花 *huohua* ‘sparkle’ (15c).

(15a) 愛 情 的 烈 焰 將 我 灼 傷  
*aiqing de lie yan jiang wo zhuo shang*  
love MOD fierce fire get me scorch injury  
‘Love scorches me.’

(15b) 愛 火 在 心 中 燃 燒  
*ai huo zai xin zhong ranshao*  
love fire at heart inside burn  
‘Love is burning in my heart.’

(15c) 他 們 兩 激 起 了 愛 情 的 火 花  
*tamen liang jiqi le aiqing de huohua*  
they two stir up ASP love MOD fire flower  
‘Their love is being stirred up.’

The quality that corresponds between the source and target domains is 溫暖 *wennuan* ‘warm’ in (15d).

(15d)他的 愛 讓 我 覺 得 很 溫 暖  
*tade ai rang wo jue de hen wunnuan*  
his love make me feel very warm  
'His love make me feel warm.'

The function that corresponds between the source and target domains are 灼傷 *zhuoshang* 'scorch' (15a), 燃燒 *ranshao* 'burn' (15b), 點燃 *dianran* 'ignite' (15e), 熄滅 *ximie* 'put out' (15f), 澆熄 *jiaoxi* 'put out' (15g), 溫暖 *wennuan* 'warm' (15h), 融化 *ronghua* 'melt' (15i), 照亮 *zhaoliang* 'light up' (15j), and 加溫 *jiawen* 'heat up' (15k).

(15e)愛情 點 燃 了 我 對 生 命 的 熱 愛  
*aiqing dianran le wo dui shengming de reai*  
love ignite ASP me for life MOD passion  
'Love ignites my passion for life.'

(15f)這 樣 的 愛 , 大 水 不 能 熄 滅  
*zhe yang de ai, da shui bu neng ximie*  
this kind MOD love big water not can put out.  
'Even a flood cannot put out a love like this.'

(15g)他的 冷 漠 澆 熄 我 的 熱 情  
*tade lengmo jiaoxi wode reqing*  
his indifference put out my passion  
'His indifferent attitude put out my passion.'

(15h)他的 愛 溫 暖 了 我 的 心  
*tade ai wenuan le wode xin*  
his love warm ASP my heart  
'His love has warmed my heart.'

(15i)他的 愛 融 化 了 冰 冷 的 心  
*tade ai ronghua le bin-len de xin*  
his love melt MOD ice-cold MOD heart  
'His love melted an ice-cold heart.'

(15j) 愛 照亮 我們的 生命  
*ai zhaoliang womende shengming*  
love light up our life  
'Love lights up our life.'

(15k) 他們的 戀情 持續 加溫  
*tamende lianqing chixu jia wen*  
their love continue add temperature  
'Their love continued to heat up.'

In the above cases, the prevalent concepts that are being mapped have to do with the warmth and light that love brings. The mapping principle is given in (15).

(15) Mapping principle for LOVE IS FIRE: Love is understood as fire because **fire involves burning with physical light and warmth and love involves giving emotional light and warmth.**

Note that the examples involving 'putting out' the fire (i.e. extinguishing passion), follow from the mapping principle since fire involves light and warmth (as does love), extinguishing that light and warmth means that the fire (and the love) is extinguished as well.

## 2.2.2 ANGER IS FIRE

The conceptual metaphor ANGER IS FIRE uses a range of lexical expressions that differ from the ones used in LOVE IS FIRE. The qualities that correspond between the source and target domains in ANGER AS FIRE metaphor are 火冒三丈 *huomaosanshang* 'fly into rage' (16a), 火大 *huoda* 'angry' in (16b), and 火上加油 *huoshangjiayou* 'stir up' in (16c), 煽風點火 *shanfongdianhuo* 'stir up trouble' (16d).

(16a) 一 聽到 這 事， 他 火 冒 三 丈。  
*yi tingdao zhei shi, ta huo mao san zhang.*  
As soon as hear this thing, he fire rise three units.  
'As soon as he heard about this event, he flew into a rage.'

(16b) 我 很 火 大。  
*wo hen huo da.*  
I very fire big.  
'I'm very angry.'

(16c)他 已經 很 生氣， 別 再 火 上 加 油。  
*ta yijing hen shenqin, bie zai huo shangjia you*  
he already very angry, not more fire on pour oil  
'He's already very angry, don't stir up more trouble.'

(16d)他 已經 很 生氣 別 再 煽風點火  
*ta yijing hen shengqi, bie zai shanfongdianhuo*  
he already very angry, not more stir up trouble  
'He is now very anger, don't stir up trouble any more.'

The functions that correspond between the source and target domains are 發火 *fahuo* 'get mad' (16e), 燒 *shao* 'burn' (16f), and 熄 *xi* 'put out' (16g).

(16e)他 發火 了。  
*ta fahuo le*  
he start fire ASP  
'He is getting mad.'

(16f)他 怒 火 中 燒， 整 張 臉 都 漲 紅 了  
*ta nu huo zhong shao, zheng zhang lian dou zhang hong le*  
He anger fire inside burn, whole CL face all flush ASP  
'He was burned with rage and flushed his cheeks.'

(16g)他 餘 怒 難 熄  
*ta yu nu nan xi*  
he left-over anger hard put out  
His anger is hard to put out.

While the expressions of FIRE used in LOVE IS FIRE are used positively, the expressions concerning FIRE used in ANGER IS FIRE are negative. Emphasis is on the size of the flames, and on their ability to burn. The mapping principle is given in (17).

(17) Mapping principle for ANGER IS FIRE: Anger is understood as fire **because fire involves physical burns and anger involves emotional burns.**

In this metaphor there is also an example relating to 'putting out' the fire. What is interesting is that in this case, the expression is on the inability of the fire to be put out. Whereas, in the LOVE case, the fire is easily extinguished, in the ANGER instance, the opposite is true.

In the above case, we demonstrated that even within the relatively constrained source domain of FIRE, there are different aspects of FIRE that can be mapped, depending on what target domain FIRE is being mapped to. However, it is not always the case that the same source domain will map different aspects to different target domains. That is, while we were able to postulate the Mapping Principle Constraint above, which says that a single target domain must select different source domains for different underlying reasons, it is not the case that a single source domain will always involve unique mapping principles with its target domains. GAMBLING, for example, is a source domain that corresponds with MARRIAGE, BUSINESS and STOCKS. In all three cases, the underlying mapping principle is the same one: because GAMBLING involves risk, and MARRIAGE/BUSINESS/STOCKS involve risk.

In sum, the Conceptual Mapping Model differs from the Contemporary Theory of Metaphor because it focuses on the analysis of the linguistic expressions used. Moreover, under this analysis, we can discover the underlying reasons for the source-target domain pairings. In addition, we discover a constraint on target domain selection of source domains (i.e. the Mapping Principle Constraint -- a single target domain must use different source domains for different reasons), and we also discover that different target domains may use the same source domain for the same reason, as in the case of GAMBLING or for different reasons as in the case of FIRE. In the next section, we will present processing claims of the CM Model and compare them with other models.

### **3.0 Comparison with other theoretical and processing models**

Our proposal examines the conventional examples of a source-target domain pairing, and from these examples extracts the entities, qualities and functions that correspond across these two domains. In order to do this, both our source and target domain must be relatively well-defined. In the next section we will present the off-line tests we used to determine if a lexical item was part of a source domain or not. Once we determined whether or not a lexical item was in the source domain or not, we then ran off-line acceptability tests to test our hypothesis that source-target domain pairings have an underlying mapping principle. Before we present our experimental findings, however, we first contrast the Conceptual Mapping Model with other theoretical and processing models of metaphor.

Clausner and Croft (1997), for example, have also suggested modifications to the Contemporary Theory of Metaphor. Their approach is to narrowly constrain the source domain so as to limit the mappings that may take place between two domains. They propose that 1) specifying a metaphor at its appropriate level of schematicity, and 2) carefully

describing the semantic structure can constrain the concepts (image-schemas) that can correspond between a source and a target domain. For example, they argue that the metaphor AN ARGUMENT IS A BUILDING is too broad and should instead be AN ARGUMENT IS THE STRUCTURAL INTEGRITY OF A BUILDING. The revised conceptual metaphor predicts that concepts such as 'foundation' would be used in the metaphor, but concepts such as chimney' and plumbing' would not, because they are not part of the structural integrity of a building.

Our Conceptual Mapping Model, has the following advantages over Clausner and Croft's schematicity proposal: 1) it is based on linguistic analysis of the image-schema correspondences that currently exist (i.e. a bottom-up approach), 2) the source domain is a conceptual category such that subjects can generate exemplars of items in that category, 3) the mapping principle explains the underlying reason the target domain has selected a particular source domain.

In addition, our approach predicts that there will be two types of novel metaphors. In one case, a novel image-schema mapping follows the mapping principle. In the second case, a novel image-schema mapping exists between a source and target domain that has other correspondences, but the novel image-schema does not follow the mapping principle. Thus, under the Conceptual Mapping Model, there (at least) three types of metaphors: 1) conventional metaphors that follow the mapping principle, 2) novel metaphors that follow the mapping principle and 3) novel metaphors that do not follow the mapping principle.

Clausner and Croft's approach, on the other hand, only distinguishes two types: 1) metaphors that fall inside the scope of the source domain, and 2) those that fall outside the scope of the source domain. In what follows we will present experimental evidence for the Conceptual Mapping Model.

In addition to the theoretical model presented by Clausner and Croft (1997), there is a processing model of metaphors, known as the Attributive Categorization Model. This model says that metaphors are category-inclusion statements of the form (*X is a Y*) (i.e. McGlone 1996, Glucksberg, McGlone and Manfredi 1997, Glucksberg and McGlone 1999). The AC view explicitly argues against a set of pre-existing correspondences between two domains, instead arguing that when a metaphor arises the source domain provides properties that are then attributed to the target domain. Thus, the AC view predicts that there will be no difference between conventional and novel uses of metaphor.

McGlone (1996), for example, tested the validity of conceptual metaphors in a series of off-line psycholinguistic studies and argued that there was no evidence that native speakers

use the knowledge mapping that conceptual metaphors provide. Instead, he proposes that the attributive categorization (AC) hypothesis better accounts for the data.

However, under the view of the CM Model, McGlone was NOT testing conceptual metaphors. For example, McGlone's use of the sentence 'Dr. Moreland's lecture was a 3-course meal for the mind' is based on the metaphor IDEAS ARE FOOD, and a '3-course meal' fits into the source domain of FOOD. It does not, however, follow the mapping principle for IDEAS ARE FOOD, which is similar to the mapping principle in Chinese, as having to do with intake and digestion. Thus, it is a novel metaphor that follows the mapping principle, but it is not a conventional conceptual metaphor. Other examples that McGlone used do not even necessarily fall in the source domain as in the case of 'their marriage is a rollercoaster' which is supposed to be an instance of the MARRIAGE IS A JOURNEY metaphor. However, is rollercoaster considered an entity in a journey? If it is not part of the source domain, or does not follow the mapping principle, then under the CM Model, conceptual metaphors were not being tested.<sup>6</sup>

Another processing model, the Structure-Mapping model (Gentner and Wolff 2000) is similar to the AC hypothesis in that it assumes that the mappings between source and target domains are not conceptual correspondences, but that they are individual occurrences that are dealt with by the processor on an individual basis. Although the Structure-Mapping Model and the AC hypothesis differ from each other in other respects, they both differ with the CM Model in that the CM Model postulates a set of mapping correspondences between a source and target domain in the case of conventional conceptual metaphors. Moreover, this set of mapping correspondences has an underlying reason for its existence (i.e. a Mapping Principle). The other two models do not recognize the existence of a set of systematic conceptual correspondences nor do they recognize the existence of a mapping principle which explains the underlying reason for the set of conceptual correspondences.

## **4.0 Experiments**

### **4.1 Off-line Acceptability Ratings of Metaphors**

In the following experiment I will look at the following questions. First, if the source domain is constrained (based on data from native speakers) and the mapping principle is followed, will conventional conceptual metaphors be accepted at the same level at literal sentences? Moreover, will they differ in degree from novel metaphors that follow the

---

<sup>6</sup> There are other methodological issues that can be discussed as well, such as whether the methodology used (i.e. paraphrasing metaphors, and paraphrasing metaphors with other metaphors) is the best task to elicit native

mapping principle? Lastly, will the novel metaphors that follow the mapping principles in turn differ from novel metaphors that don't follow mapping principles?

*Subjects.* 132 National Taiwan University undergraduate student volunteers from 4 different classes participated in this study. Participants were native speakers of Mandarin who were exposed to Mandarin before the age of seven. They had to rate their general proficiency of Mandarin 5 or above (on a scale of 1 to 7) to qualify for the experiment.

*Materials.* Eighteen metaphors were used in the experiment. Each metaphor was first analyzed and its mapping principle determined by five linguists trained in the CM Model. Then each analysis and mapping principle was presented to a group of linguists from the Chinese Knowledge Information Processing Group and from the other projects in our NSC group project for suggestions. Conceptual metaphors for Mandarin Chinese (i.e. LOVE IS A PLANT) were used in this experiment only when the analyses and mapping principles were agreed upon by this latter group.

Each metaphor contains 6 types of sentences, including (a) literal pair of conventional metaphor, (b) conventional metaphor, (c) literal pair of novel metaphor following the mapping principle, (d) novel metaphor following the mapping principle, (e) literal pair of novel metaphor not following the mapping principle, and (f) novel metaphor not following the mapping principle. An example is given in (17) below for the metaphor LOVE IS A PLANT (Ahrens and Lai 2000). The mapping principle in this case is as follows: LOVE IS A PLANT because plants involve physical growth and love involves emotional growth. Example (17a) is a conventional usage of this metaphor, while (17c) is an example of a novel usage that follows the mapping principle of 'growth'. Example (17e), however, is an example of a novel usage that does not follow the mapping principle because it has to do with 'death' and not 'growth'.

(17a) 她 的 愛 情 開 始 萌 芽  
*ta de aiqing kaishi mengya*  
she Mod love start sprout  
Her love starts to sprout

(17b) 她 的 植 物 開 始 萌 芽  
*ta de zhiwu kaishi mengya*  
she Mod plant start sprout  
Her plant starts to sprout

(17c)她的愛情 開始 扎根  
*ta de aiqing kaishi zhagen*  
she Mod love start rooting  
Her love starts to root

(17d)她的植物 開始 扎根  
*ta de zhiwu kaishi zhagen*  
she Mod plant start rooting  
Her plant starts to root

(17e)她的愛情 開始 落葉  
*ta de aiqing kaishi luoye*  
she Mod love start fall leaves  
Her love starts to fall leaves

(17f)她的植物 開始 落葉  
*ta de zhiwu kaish luoye*  
she Mod plant start fall leaves  
Her plant starts to fall leaves.

In addition, before the acceptability experiment was run, several conditions had to be met. First, all the metaphorical terms (such as *mengya* ‘sprout’, *zhagen* ‘root’ and *luoye* ‘fall (leaves)’) had to be considered as being in the source domain (in this case PLANT) by a group of native speakers. Thus, the following two pretests were run: a source domain rating test, and a yes-no source domain test. 31 National Taiwan University undergraduate students participated in the source domain rating tests and 20 NTU undergraduates participated in the source domain yes/no test. All participants had to meet the language requirements described previously. The subjects were given the source domain (i.e. *zhiwu* ‘plants’) and asked if the word next to it was related to it (i.e. *mengya* ‘sprout’). On the rating task, they were asked to rate the strength of the relationship from 1 to 7, with 7 being highly related. In the yes-no task, they were simply asked to circle yes or no. Items were only included in the acceptability experiment that both 1) had a mean over all subjects of 4.9 or above on the ratings test and 2) a mean of .7 or above for the yes/no test.

Moreover, we also ascertained that groups (a-b) (i.e. *mengya* ‘sprout’), (c-d) (i.e. *zhagen* ‘root’), and (e-f) (i.e. *luoye* ‘fall (leaves)’) did not differ in terms of frequency of lexical items. The frequency norms are based on CKIP (1993). The means of the groups are 11667, 11767, and 9996 with an SD of 9354, 8936, 6276 respectively;  $F(2,47)=.231, p = .795$ ).

The prediction for the CM model is that the literal sentences should be equally good

(b=d=f). In addition, the conventional conceptual metaphor (a) should be ranked equally with the literal sentences. However, the novel metaphors should both be ranked lower than their literal counterparts (i.e. (c) < (d), (e) < (f)), and there should be a gradation in the ranking of the metaphorical sentences such that (a) > (c) > (e).

Clausner and Croft’s model, on the other hand, predicts that (a) and (c) should not differ in acceptability because (c) in their model would still fall under the constrained source domain. Furthermore, the AC hypothesis and SM model predict no difference between (a) and (c) and (e), since in these models, each metaphorical mapping is a unique event that is dealt with individually.

*Procedure.* The 108 experimental sentences were divided into six booklets with 18 examples each using a counter-balanced design, so that no subject saw a sentence from any one of the conceptual metaphors more than once. The subjects were randomly given one booklet containing a set of instructions. They were instructed to rate the sentences according to their acceptability. If they felt the sentence to be not strange at all and acceptable, then they should give a rating of 7. If the sentence is strange and unacceptable, then they should give the sentence a rating of 1. If they felt that the acceptability is in between acceptable and unacceptable, then they were to choose from 2 to 6 depending on the level of acceptability. Two practice examples were then given before they started to rate the acceptability of experimental sentences.

## Results

The data from 132 subjects were tallied and the means were calculated across all subjects for the six sentence conditions. The means for each sentential condition and its related standard deviation are given in Table 1.

Table 1: Means for acceptability ratings of literal and metaphorical sentences

S-type	mean	SD
A (conventional metaphor)	6.1	1.0
B (literal pair to A)	6.0	1.0
C (novel metaphor that follows mapping principle)	5.0	1.4
D (literal pair to C)	6.0	1.2
E (novel metaphor that doesn’t follow mapping principle)	4.0	1.5
F (literal pair to E)	5.4	1.2

We see that the conventional metaphorical sentence (A) and its paired literal sentence (B) are almost the same, with the conventional metaphorical sentence rated slightly higher (6.1 vs. 6.0). In addition, the novel metaphor that follows its mapping principle (C) is ranked lower than that of its literal pair (D) (i.e. 5.0 vs. 6.0), and the novel metaphor that doesn’t follow its

mapping principle (E) is also ranked lower than its literal pair (F) (i.e. 4.0 vs. 5.4). In addition, there is a decline in the mean with conventional metaphors (A) receiving the highest score (6.0), then the novel metaphor that follows the mapping principle (C) receiving a mean score of (5.0) and then the novel metaphor that doesn't follow the mapping principle (E) received a mean score of (4.0).

For the overall analysis of variance which consisted of the between subject variables of booklets (6) and within subjects variable of Sentence type (metaphorical (A,C,E) versus literal (B,D,F)), a significant effect main effect of Sentence type was found over subjects ( $F(5,630)=112.5$ ,  $MSe=.782$ ,  $p<.001$ ) and over items ( $F(5,72)=11.4$ ,  $MSe=1.052$ ,  $p<.001$ ). Of major importance to the hypothesis under investigation, *a priori* planned comparisons were performed on the metaphorical sentences and their associated literal pairs. The conventional metaphorical sentences (A) did not differ significantly from their literal pairs (B),  $t=.28$ ,  $p=1.0$ . The novel metaphors that follow their mapping principle (C) did differ significantly from their literal sentence pairs (D),  $t=8.9$ ,  $p<.001$ . The novel metaphors that do not follow their mapping principle (E) also differed significantly from their literal sentence pairs (F),  $t=13.12$ ,  $p<.001$ .

In addition, further planned comparisons of the three metaphorical sentences show that the difference in ratings between the conventional metaphorical sentences (A) and the novel metaphorical sentences that follow the mapping principle (C) was significant,  $t=9.6$ ,  $p<.001$ . Furthermore, the difference in ratings between the novel metaphorical sentences that follow the mapping principle (C) and the novel metaphorical sentences that don't follow the mapping principle (E) was also significant,  $t=9.5$ ,  $p<.001$ .

## 4.2 Off-line Interpretability Rating on Metaphor

The previous experiment looked at how acceptable subjects found the sentences. However, if they were asked to rate how interpretable the sentence was, and also asked to give an interpretation, we might find that the novel forms are equally uninterpretable. That is, under an AC view, conventional instances may be lexicalized (i.e. a lexical item may be polysemous between a literal and metaphorical meaning), but novel instances should create a new category above the source and target domain. Under the AC view, then, neither kind of novel metaphors would have an interpretability advantage. However, under the CM view, novel metaphors that follow a MP should have an interpretability advantage upon those that don't.

132 subjects from NTU were tested in the Interpretability experiment. The materials and design was exactly the same as in the previous experiment, except that subjects were instructed to rate the sentences according to their interpretability. If they felt the sentence to

be interpretable at the first sight, then they should give a rating of 7. If the sentence is not interpretable, then they should give the sentence a rating of 1. If they felt that the interpretability is in between interpretable and uninterpretable, then they were to choose from 2 to 6 depending on the level of interpretability. Two practice examples were then given before they started to rate the interpretability of experimental sentences.

## Results

The data from 132 subjects were tallied and the means were calculated across all subjects for the six sentence conditions. The means for each sentential condition and its related standard deviation are given in Table 2.

Table 2: Means for interpretability ratings of literal and metaphorical sentences

S-type	mean	SD
A (conventional metaphor)	6.5	0.7
B (literal pair to A)	6.5	0.7
C (novel metaphor that follows mapping principle)	5.6	1.3
D (literal pair to C)	6.6	0.7
E (novel metaphor that doesn't follow mapping principle)	4.6	1.7
F (literal pair to E)	6.2	1.0

We see that the conventional metaphorical sentence (A) and its paired literal sentence (B) are exactly the same (6.5 vs. 6.5). In addition, the novel metaphor that follows its mapping principle (C) is ranked lower than that of its literal pair (D) (i.e. 5.6 vs. 6.6), and the novel metaphor that doesn't follow its mapping principle (E) is also ranked lower than its literal pair (F) (i.e. 4.6 vs. 6.2). In addition, there is a decline in the mean with conventional metaphors (A) receiving the highest score (6.5), then the novel metaphor that follows the mapping principle (C) receiving a mean score of (5.6) and then the novel metaphor that doesn't follow the mapping principle (E) received a mean score of (4.6).

For the overall analysis of variance which consisted of the between subject variables of booklets (6) and within subjects variable of Sentence type (metaphorical (A,C,E) versus literal (B,D,F)), a significant effect main effect of Sentence type was found over subjects ( $F(5,630)=108.7$ ,  $MSe=.748$ ,  $p<.001$ ) and over items ( $F(5,72)=24$ ,  $MSe=.462$ ,  $p<.001$ ). Of major importance to the hypothesis under investigation, *a priori* planned comparisons were performed on the metaphorical sentences and their associated literal pairs. The conventional metaphorical sentences (A) did not differ significantly from their literal pairs (B),  $t=.07$ ,  $p=1.0$ . The novel metaphors that follow their mapping principle (C) did differ significantly from their literal sentence pairs (D),  $t=9.6$ ,  $p<.001$ . The novel metaphors that do not follow their mapping principle (E) also differed significantly from their literal sentence pairs (F),  $t=15.27$ ,  $p<.001$ .

In addition, further planned comparisons of the three metaphorical sentences show that the difference in ratings between the conventional metaphorical sentences (A) and the novel metaphorical sentences that follow the mapping principle (C) was significant,  $t=8.6$ ,  $p<.001$ . Furthermore, the difference in ratings between the novel metaphorical sentences that follow the mapping principle (C) and the novel metaphorical sentences that don't follow the mapping principle (E) was also significant,  $t=9.4$ ,  $p<.001$ .

## 5.0 Discussion

The findings in both the acceptability and interpretability experiments verified the predictions of the Conceptual Mapping Model. In particular, conventional conceptual metaphors were rated as being equally acceptable and interpretable to literal expressions, and were rated higher than novel metaphors. Furthermore, and most crucially, conventional conceptual metaphors were rated more highly than novel metaphors that followed the mapping principle and furthermore, novel metaphors that followed the postulated mapping principles were rated more highly than novel metaphors that stayed in the same source domain, but did not follow the mapping principle. While Clausner and Croft's hypothesis would predict a difference between these two latter groups, they would not predict a difference between conventional metaphors and novel metaphors that follow the mapping principle, since in their theory metaphors that follow the mapping principle and the conventional metaphors are both part of the same constrained source domain. The Attributive Category Hypothesis and the Structure-Mapping Model, moreover, predicted that there should be no difference in acceptability between any of the three types of metaphor (unless they invoke frequency for the conventional metaphors) since under these models, there is no coherent system of conceptual correspondences and each metaphoric mapping is unique. The predictions of these two models also did not hold.

This is not to say, however, that any of the above models should be discarded. What is needed now is a re-examination of the types of metaphors used in previous experiments. For example, since both the AC Hypothesis and the Structure Mapping Model do not postulate as system of conceptual correspondences, it is doubtful that their models can handle conceptual metaphors. However, other metaphors, such as those that are created out of pairings of source and target domains that do not have other systematic conceptual correspondences, or novel metaphors that do not follow the mapping principle, might best be dealt with under one of these models. For instance, it is plausible to think that in cases where there is no pre-existing conceptual correspondences, statements of the type 'X is a Y' may in fact be dealt with as class-inclusion statements. Thus, these two processing models need to delimit the type of metaphor being tested in order to adequately access their processing claims. In future work,

we hope to further test processing claims of the different models on the different types of metaphor as defined within the Conceptual Mapping Model.

Lastly, we would like to point out that Clausner and Croft's theory can be viewed as similar to our own. They also, for example, point out that the CTM as previously formulated is not adequately constrained. Their theory's focus on delimiting the source domain is the step they took to constrain the theory. Our step is different in design, but similar in spirit. We propose that by delimiting the source and target domain to conceptually coherent categories (such that subjects can make judgments about whether an item belongs in or is related to that category or not), and by examining the linguistic evidence (i.e. the entities, qualities and functions that map between the source and target domains), a mapping principle can be formulated which will explicated the underlying reason for the existing correspondences. It is the mapping principle that constrains the image-schematic mappings. In sum, we hope that by putting forth the Conceptual Mapping Model, future work in understanding the processing of conceptual and novel metaphors will be facilitated.

## 6.0 Conclusion

In this paper we present the Conceptual Mapping Model and propose the concept of mapping principles. The CM model, which is designed to be a processing model within the CTM, can explain why McGlone (1996) did not find evidence for the CTM. In short, McGlone tests metaphors that are not only *not* conventional, they are also *non-conventional* metaphors that do *not* following the mapping principle of the source to target domain pairing. That is, McGlone mistakenly tested what he thought were conceptual metaphors (such as 'Their marriage is a rollercoaster'), when in fact he was testing novel metaphors. This misunderstanding about what can be involved in a source to target domain mapping may be an unintended result of Lakoff (1993) proposal that the general principles governing the patterns of metaphorical correspondences are part of an entire metaphorical scenario. While this may be the case, it is necessary to do a linguistic analysis in order to make psycholinguistic predictions. Thus, I have instead proposed that the governing patterns in the metaphorical correspondences must be analyzed at a linguistic level after which mapping principle can be proposed. Once this analysis has been done, then experiments can be designed to examine the processing of a particular type of metaphor (i.e. conceptual or novel, and within the category of novel metaphors, following mapping principles or not following mapping principles).

In addition, the CM model also differs from the theory of CTM in proposing a narrowing of scope for a processing model of metaphors. That is, in the CM model it is possible that conventional uses of conceptual metaphor are lexicalized and listed as separate senses within

a lexeme (Ahrens et al. 1998). This proposal would be in line with (Keyser et al. 2000) who propose that Lakoff and Johnson's claim (1980) that conventional expressions are functionally activated in each instance is too strong. Keyser et al. find evidence that only non-conventional usages activate conceptual metaphors. Although Keyser et al. use their evidence to question foundation of the CTM, in the CM model there is no need to throw out the CTM. The conventional, lexicalized usages are listed in the lexical entry, and novel usages are created as necessary. They may or may not follow the MPs as discussed above. The critical point is that the CM model retains the CTM's concept that there is an underlying reason for mapping to exist between the source and target domain, while the AC model proposes no such underlying conceptual structure.

In this paper I have emphasized the implications for theoretical and processing models of metaphor. However, the Conceptual Mapping Model can be extended beyond these boundaries. For example, within the field of translation, the CM Model can be useful in analyzing how to translate conceptual metaphors from one language to another. Should a similar source domain be used in the translation as in the original if it means that the mapping principle inferred is different? Moreover, from a cross-linguistic perspective, analyzing specific image schemas over a range of conceptual metaphors will allow us to better understand the types of image-schemas that are universal to the human conceptual system. This in turn, should contribute to a unified theory of knowledge (i.e. Wilson 1998) since we can only understand the world through our metaphors about the world (i.e. the theory of light as a wave or a particle). The more clearly we understand our metaphors, the more clearly we will know the limits on our understanding of the world.

### **Acknowledgements**

I would like to thank the co-director of this project, Professor Biq Yung-O for generously sharing her time and insight with me. I would also like to thank the project assistants, Hui-Ru Hsiung, Tzu-yin Lai, Dora Lu and Ya-hui Sung for the time and energy they have put into this project. I would also like to thank Chu-Ren Huang and Mei-Chun Liu for their comments and critique on the data presented here. In addition, I would like to thank Chung-Ping Cheng for his help with the statistical analyses. Lastly I would like to thank the National Science Council for their financial support (NSC grants #88-2420-H-002-005 and #89-2411-H-002-063-MC), without which this research would not have been possible.

### **References**

- Ahrens, Kathleen. 2001. "Mapping Principles in Conceptual Metaphors." Presented at the International Conference on Cognitive Linguistics, University of California, Santa Barbara, July 22-27.
- Ahrens, Kathleen and Dora Lu. 2001. "A Cross-linguistic Study on Love Metaphors." Presented at the International Conference on Cognitive Linguistics, University of

California, Santa Barbara, July 22-27.

- Ahrens, Kathleen and Lai Tzuyin V. 2001. "Mappings From The Source Domain of Plant in Mandarin Chinese" Proceedings of the 15<sup>th</sup> Pacific Asia Conference on Language Information and Computation. City University, Hong Kong, Feb, 1-3.
- Ahrens, Kathleen, Lai Tzuyin V, and Huang Chu-Ren. 2001. "Source Domains for Marriage in Mandarin Chinese." Presented at IACL-10 & NACCL-13, University of California, Irvine, June 22-24
- Ahrens, Kathleen, Lu Hsin-yi. D, and Biq Yong-O. 2001. "Food Metaphor in Mandarin Chinese." Presented at IACL-10 & NACCL-13, University of California, Irvine, June 22-24.
- Ahrens, Kathleen & Ya-hui Sung. 2001. "More Than Conventional--Mapping Principle in Poetic Metaphors." Unpublished Manuscript. National Taiwan University.
- Ahrens, Kathleen & Chu-Ren Huang. 2000. "Time is Motion in Mandarin Chinese. Parameterizing Conceptual Metaphors". ISCLL-7, National Chung-Cheng University, December 22-24.
- Ahrens, Kathleen, Chang Lily., Chen Ke-jien., & Huang Chu-Ren. 1998. "Meaning representation and meaning instantiation for Chinese nominals." *Computational linguistics and Chinese language processing*, 3, 45-60
- CKIP. 1993. *Corpus-Based Frequency Count of Words in Journal Chinese*. Academia Sinica, Chinese Knowledge Information Processing Group, Taipei.
- Clausner and W. Croft. 1997. "Productivity and schematicity in metaphors." *Cognitive Science* 21, 247-282.
- Gentner, D. and G. Wolff. 2000. "Evidence for Role-Neutral Initial Processing of Metaphors." *Journal of Experimental Psychology*, 26, 529-541.
- Glucksberg, S. and McGlone, M. S. 1999. "When love is not a journey: What metaphors mean." *Journal of Pragmatics*, 31, 1541-1558
- Glucksberg, S., McGlone, M. S., and Manfredi D. 1997. "Property Attribution in Metaphor comprehension." *Journal of Memory and Language*, 36, 50-67.
- Keyser Boaz, Shen, Y., Glucksberg, S., and Horton, W. S. 2000. "Conventional Language: How Metaphorical is it?" *Journal of Memory and Language* 43, 576-593.
- Lakoff, G. 1993. "The Contemporary Theory of Metaphor." In Andrew Ortony (ed.) *Metaphor and Thought* (2<sup>nd</sup> ed.). Cambridge: Cambridge University Press. P 202-251.
- McGlone, M. S. 1996. "Conceptual Metaphors and Figurative Language Interpretation: Food for Thought?" *Journal of Memory and Language*, 35, 544-565.
- Su, Lily I-Wen. 2000. "Mappings in Thought and Language as Evidenced in Chinese." *Conference on the Creativity of Linguistics in Taiwan*. Jan. 14-15.
- Wilson, Edward. 1998. *Consilience: The Unity of Knowledge*. New York: Alfred A. Knopf.