行政院國家科學委員會專題研究計畫 成果報告

語境對處理新穎隱喻和約定俗成隱喻的影響
研究成果報告(精簡版)

計 畫 主 持 人 ：安可思
共 同 主 持 人 ：劉鶴齡、李佳穎
計 畫 參 與 人 員 ：學士級-專任助理：張心韶
　　　　　　　　　博士班研究生-兼任助理：龔書萍、鍾曉芳、洪珈菲、李逸
　　　　　　　　　薇、Katarzyna Horszowska
　　　　　　　　　碩士班研究生-兼任助理：張有鈞

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行政院國家科學委員會專題研究計畫成果報告

語境對處理新穎隱喻和約定俗成隱喻的影響
The Effect of Context on the Processing of Novel and Conventional Metaphors

主持人： 安可思 國立台灣大學語言學研究所
共同主持人： 李佳穎 中央研究院語言學研究所
劉鶴齡 私立長庚大學醫學影像暨放射科學系

一、中文摘要

在這個研究中，我們探討了當我們在理解段落中的概念隱喻時，是否會使用概念對映規則。特別是，根據我們先前研究所發現的歧異結果(Gong & Ahrens 2003, 2004, 2005a, 2005b)，我們假設了可能是二個原因所導致的：1) 不同的作業需求(判斷作業及閱讀作業) (2)實驗材料不同的呈現分式(段落呈現及句子呈現)。為了探討是哪一個原因會影響概念對映在語境中的提取，我們執行了二個線上實驗。我們的研究結果證實當實驗材料以段落方式呈現，概念對映存在的假設以及在語境中會被提取。我們解釋了當實驗材料用一句一句的方式呈現時，這種方式會讓受試者預期閱讀新的訊息，所以並不會激發概念對映。然而，不管使用哪一種作業，利用段落呈現的分式是會建立及提取概念對映。

關鍵字：概念隱喻、概念對映、一致性、作業需求、刺激材料呈現方式

Abstract

In this study, we investigate whether or not conceptual mappings are accessed and used in on-going discourse when people process conceptual metaphors. In particular, we postulate that the conflicting results of our previous studies (Gong & Ahrens 2003, 2004, 2005a, 2005b) may be due to either one or both of the two diverse methods employed: (1) the different task demands (a judgment task employed by the former versus a reading task employed by the latter) and (2) the distinct visual presentations of stimuli (a paragraph presentation in the former versus the line-by-line presentation in the latter). We carried out two on-line tasks in order to examine which factors affect the access of conceptual mappings in on-going discourse. Our study supports the hypothesis that conceptual mappings exist and are accessed in on-going language processing when materials are presented in a paragraph style. We argue that the line-by-line presentation method creates an expectation for new information, and thus, does not facilitate the activation of conceptual mappings, while a paragraph presentation method allows for conceptual representations to be built and accessed, regardless of what types of task is used.

Key words: conceptual metaphors, conceptual mappings, congruency, task demands, stimuli presentation method

二、緣由與研究動機

In recent years, I have investigated whether or not conceptual mappings are processed when people read metaphors in discourse. In our past studies, we tested two stimuli conditions: conceptual metaphors with congruent mappings to the prior contexts and those with incongruent mappings to the prior contexts, and expected that the congruent condition should be interpreted more effortlessly and faster than the incongruent condition.

However, our previous studies (Gong & Ahrens 2003, 2004, 2005a, b) showed conflicting results. In an off-line paragraph appropriateness rating task, the congruent condition did have higher appropriateness rating scores than the incongruent condition. In addition, the on-line appropriateness paragraph judgment task showed the incongruent condition took longer to judge than the congruent condition. However, in the on-line sentence reading task, we found that the incongruent condition did not take longer to read than the congruent condition. So, it remains unclear for the issue of whether or not conceptual mappings are accessed in discourse.

Based on the conflicting findings of our previous studies, we postulate two possibilities to explain why the results of the paragraph rating or judgment tasks (Ahrens 2003, 2005a, b) diverge from the results of the sentence reading task (Gong & Ahrens 2004). First, the demands of the task may influence the use of the conceptual mappings in on-going discourse. In fact, the three experiments we conducted adopted different tasks to test this issue. Participants were asked to judge the appropriateness level of metaphors to prior contexts in Gong & Ahrens' (2003, 2005a,b) studies, but metaphors were simply read in Gong & Ahrens (2004). It is possible that the conceptual mappings in on-going discourse are only activated under the condition of a judgment task, but not during a reading task, since it requires more processing resources to read and make a judgment.

Second, the way in which materials were presented may also have affected the on-line access of conceptual mappings in on-going discourse. Our previous studies (Gong & Ahrens 2003, 2005a,b) gave participants paragraph-long texts with a terminal metaphorical sentence to read while the other study (Gong & Ahrens 2004) let participants to read texts sentence-by-sentence. It is possible that the paragraph presentation allowed the metaphorical concepts to build on one another, which allowed the access of the conceptual mappings.

In this study, we investigate whether or not the access of metaphoric mappings occurs in the processing of metaphors in on-going discourse. In particular, we postulate that that the divergent results in previous studies (Gong & Ahrens 2003, 2004, 2005a, b) may be due to either one or both of the two diverse methods employed: (1) the different task demands (a judgment task versus a reading task) and (2) the distinct visual presentations of stimuli (a paragraph presentation versus the line-by-line presentation). In addition, in our current study we will also control for word frequency of the target idioms and the level of semantic association between target idiomatic phrases and contextual lexical words. We will conduct two on-line tasks in order to examine whether task demands or stimuli presentation affect the activation of conceptual mappings in the process of conceptual metaphors in on-going discourse.

In Experiment 1, an on-line *paragraph reading* task, participants in this task will read a paragraph that contains four to five examples of a particular conceptual metaphor with a target sentence (that contains either an instance from the same conceptual mapping or from different conceptual mappings). Word frequency, collocating frequency and the level of acceptability between the two terminal sentence conditions will be controlled. In Experiment 2, an on-line *sentence judgment* task, participants will be asked to *judge* the same materials with a *line-by-line context presentation*.

It is hypothesized that either the presentation method of stimuli or task demands involved influences the access of conceptual mappings in the processing of conceptual metaphors in on-going discourse. In particular, if a *paragraph* presentation method (Dillon, Richardson, & McKnight, 1990; Mandler & Johnson, 1977) allows for conceptual representations to be built up, we predict that the incongruent target pairings will be rated less appropriate and take longer to read and judge than the congruent target pairings in all paragraph presentation tasks

regardless of task type, i.e. Experiments 1. However, if a *judgment* methodology (Love, et al., 2003) aids participants in computing conceptual mappings when prior contexts are presented, we predict that the incongruent target pairings will be rated less appropriate and take longer to read and judge than the congruent target pairings in all judgment tasks regardless of what presentation style of materials is employed, i.e. Experiments 2.

三、方法、結果與討論

Experiment 1: An On-Line Paragraph Reading Task

This experiment was conducted to investigate whether conceptual mappings are accessed when the materials are presented in a paragraph style regardless of task type. Participants read materials that were presented in a paragraph style and the reading time of each terminal target sentence was measured.

We expect that the paragraph presentation method influences the access of conceptual mappings in on-going discourse regardless of the types of tasks and facilitates the reading times. We predict that the incongruent target pairings will take longer to read than the congruent target pairings in this task.

Method
Participants. Forty undergraduates (mean age = 20.3 years, SD =1.2 years) from National Taiwan University served as paid volunteers. All were native Mandarin speakers, and none served as participants in Experiments 1 and 2.
Materials. We used the same stimuli of our previous studies (Gong & Ahrens 2004, 2005a, b).
Procedure. Participants were instructed to read the paragraph that were presented in a paragraph style. They rested their index finger on the button. After they pressed the button, a paragraph-long text appeared at the center of the screen. After they finished reading, participants had to press the button again and the whole context disappeared.

Immediately, the terminal target sentence appeared on the screen. And when they finished reading, they had to press the button again. Reading time for each terminal target sentence was measured from the onset of the sentence to the button pressed by participants. Participants had to answer six true/false comprehension questions in the middle of the experiment.

Results and Discussion
Data of forty participants were computed and analyzed. The mean reading times for terminal metaphorical sentences which are conceptually congruent and incongruent with prior contexts were 2116ms (SD = 642) and 2368ms (SD = 779), respectively. The congruent condition is 252 milliseconds faster than the incongruent condition.

A four-by-two mixed design ANOVA for reaction times was run on individual participants data employing List (4) as a between-participants factor (materials counterbalancing factors) and Sentence Type (congruent and incongruent) as within-participants factors. An overall significant main effect of Sentence Type was found for the participant analysis (F_1 (1, 36) = 18.91, p < .05) and for the item analysis (F_2 (1, 64) = 5.17, p < .05). There was no main effect of List for the participant analysis (F (3, 36) = 1.24, p = .31).

The results of this on-line paragraph reading task demonstrates that the incongruent target pairings significantly took longer to read than the congruent target pairings, which suggests that people use the conceptual knowledge during metaphor processing in on-going discourse when the preceding context was presented in a paragraph style. This confirms the hypothesis that the paragraph presentation, regardless of what tasks are used, influences whether or not conceptual mappings are accessed on-line in the processing of metaphors in on-going discourse. In the following experiment, we will examine whether that conceptual mappings are accessed in on-going discourse when a judgment task is used irrespective of the method of material presentation.

Experiment 2: An On-Line Sentence Judgment Task

The purpose of this task is to investigate whether conceptual mappings are accessed in a judgment task regardless of what types of material presentation are used. In this task, participants were instructed to read the materials that were presented sentence-by-sentence. The reading time of each terminal target sentence was measured.

If the judgment method influences the access of conceptual mappings in on-going discourse, regardless of the types of material presentation, we predict that the incongruent target pairings will take longer to judge than the congruent target pairings in this task. In addition, the correct rate for yes/no appropriateness judgment for the incongruent target pairings will be significantly lower than for the congruent target pairings.

Method
Participants. Forty undergraduates (mean age = 20.4 years, SD =1.6 years) from National Taiwan University served as paid volunteers. All were native Mandarin speakers, and none served as participants in Experiments 1.
Materials. Experiment 2 used the same stimuli as Experiments 1.
Procedure. Participants had to judge the appropriateness level between the prior contexts and the terminal sentences, except in this experiment the materials were presented line-by-line. The text was presented line-by-line when participants pressed the button. Before each terminal target sentence, a cross "+" appeared in the middle of the screen. The purpose of this cross was to indicate the following sentence was the final sentence of the whole text. The cross disappeared immediately when participants' pressed the button and the terminal sentence appeared on the screen. Participants had to read the terminal sentence and judge whether the terminal metaphorical sentence was appropriate to the preceding context by pressing the designated button either for *shi-dang* "highly appropriate" or for *bu-shi-dang* "highly inappropriate". Reaction time for each terminal target sentence was measured from the onset of the sentence to the button pressed by participants. Like previous experiments, participants had to answer six true/false comprehension questions in the middle of the task.

Results and Discussion
Data of forty participants were computed and analyzed. We included all reaction times no matter whether participants responded to it as appropriate or not appropriate. The mean reading times for terminal metaphorical sentences which are conceptually congruent and incongruent with prior contexts were 4108ms (SD = 1731) and 4414ms (SD = 1803), respectively. The congruent condition is 306 milliseconds faster than the incongruent condition. In addition, the mean correct proportion for appropriateness YES judgment were 52% (SD = 36%) for the congruent target sentences and 49% (SD = 26%) for the incongruent target sentences.

A four-by-two mixed design ANOVA for reaction times was run on individual participants data employing List (4) as a between-participants factor (materials counterbalancing factors) and Sentence Type (congruent and incongruent) as within-participants factors. No significant main effect of Sentence Type was found for the participant analysis (F_1 (1, 36) =1.83, p = .19) and for the item analysis (F_2 (1, 64) = .97, p = .33). There was a main effect of List for the participant analysis (F (3, 36) = 2.99, p < .05). Furthermore, a four-by-two mixed design ANOVA for appropriateness proportion was run on individual participants data employing List (4) as a between-participants factor (materials counterbalancing factors) and Sentence Type (congruent and incongruent) as within-participants factors. No significant main effect of Sentence Type was found for the participant analysis (F_1 (1, 36) = .43, p = .52) and for the item analysis (F_2 (1, 64) = .56, p = .46). There was no main effect of List for the participant analysis (F (3, 36) = .43, p = .74).

The results show that the incongruent target pairings did not take longer to comprehend than the congruent target pairings. In addition, the congruent target parings were not judged significantly more appropriate than the incongruent pairings. This result does not support the hypothesis that task demands influences the access of conceptual mappings in the processing of metaphors in on-going discourse. As compared with the results of our previous studies (Gong & Ahrens 2003, 2004, 2005a, b, 2006), where the congruent pairings were read faster than the incongruent pairings when the text was presented in a paragraph format, no facilitation effect in reaction times between two metaphorical parings were found in the line-by-line presentation method.

General Discussion

This present study investigates whether or not conceptual mappings are accessed in on-going discourse and postulates two factors, the task demands (i.e. a reading task or a judgment task) and the methods of stimuli presentations (materials presented sentence-by-sentence or in a paragraph style) that may affect such activation. We examined metaphors that shared either congruent or incongruent conceptual mappings to prior contexts and conducted two experiments to resolve this controversial issue.

The results of the two experiments presented herein and our previous studies (Gong & Ahrens 2003, 2004, 2005a, b & 2006) demonstrate the evidence supporting that conceptual mappings are accessed in the processing of metaphors in on-going discourse when metaphoric statements are presented in a paragraph style, while the line-by-line presentation doesn't elicit this kind of activation. We found that the mean reaction/reading times and rating scores/correctness percentages for the terminal metaphor sentences in congruent pairings were significantly faster and higher, respectively, than those in conceptually incongruent pairings when materials were presented in a paragraph style in the off-line

paragraph rating/judgment task, the on-line paragraph judgment task, and the on-line paragraph reading task. Furthermore, the incongruent target pairings didn't take significantly longer to read and judge than the congruent target pairings when materials were presented line-by-line in the on-line sentence judgment task and the on-line sentence reading task. Moreover, the correctness percentage for congruent parings was not significantly higher than for incongruent pairings.

Our findings show that conceptual mappings exist and are accessed in on-going discourse. When a conceptual metaphor is encountered in on-going discourse, and when the target domain remains constant and the metaphors all are taken from the same source domain, then there is continuity in conceptual processing. However, if the metaphor is taken from a different source domain, then an adjustment needs to be made in order to understand the text. This occurs even though the two congruent and incongruent target sentences, which were controlled to be equally acceptable in an off-line acceptability rating test, are conventional expressions and make sense in the on-going discourse.

In sum, our study has methodological implications for researchers in investigating the issue of the access of conceptual mappings in the processing of metaphors in on-going discourse. First, our research supports that the factor of the presentation method of metaphorical expressions influences the access of conceptual mappings in on-going discourse. In particular, the paragraph presentation may encourage people to access conceptual mappings in the processing of metaphors while the line-by-line presentation does not. Second, the issue of the task demands, however, is rejected to play a role during the understanding of metaphors in discourse. Third, this research resolves the conflicting results of our previous studies (Gong & Ahrens 2003, 2004, 2005a, b) and points out under what circumstances (i.e. when materials are presented in a paragraph style) the on-line access of conceptual mappings

happens in on-going discourse. Future work will focus on investigating if conceptual mappings are activated when the paragraph and terminal sentence are novel metaphors but presented line-by-line in order to better understand how different types of metaphors are processed and integrated in on-going discourse.

四、計畫成果自評

In the past year, we completed two on-line experiments to examine whether the context affect the processing of conceptual metaphors in Mandarin Chinese. We found that conceptual mappings exist and are accessed in on-going language processing when materials are presented in a paragraph style. We argue that the line-by-line presentation method creates an expectation for new information, and thus, does not facilitate the activation of conceptual mappings, while a paragraph presentation method allows for conceptual representations to be built and accessed, regardless of what types of task is used. We are satisfied that we found out the reason for causing the divergent results of our previous studies.

In addition, we have significant academic achievements in this past year. We have published four journal papers -- Ahrens (2006a, b); Ahrens et al. (2007); Gong & Ahrens (In Press). In particular, we published one of our papers (Ahrens et al. 2007) in the journal *Brain and Language*, which is an outstanding and well-known international journal for discussing pioneer research on language and brain. It is included in the social science citation index (SSCI). Furthermore, another paper (Gong & Ahrens, In Press) will be published on the journal *Metaphor & Symbol*, which is also an well-known international academic journal. It publishes many outstanding studies on non-literal language, including conceptual metaphors, irony, metonym, etc. It is also included in the social science citation index (SSCI) and art & humanities citation index (A&HCI).

In addition, we published one book chapter (Huang et al. (2006), and ten conference papers -- Ahrens (2006c), Ahrens & Chung (2006), Chung & Ahrens (2006a), (2006b), (2006c), Gong & Ahrens (2006), Gong, Ahrens & Huang (2007), and Lu & Ahrens (2006a, b), and Hong, Huang & Ahrens (2007). I also wrote 2 book chapters (Ahrens, Forthcoming-a, b)Additional papers have been submitted for one book chapter-- Ahrens & Chung (Under Review) and for three journals for review -- Gong & Ahrens (Under Review), Lu & Ahrens (Under Review), and Tsai & Ahrens (Under Review). We thank the National Science Council of Taiwan for supporting this research.

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