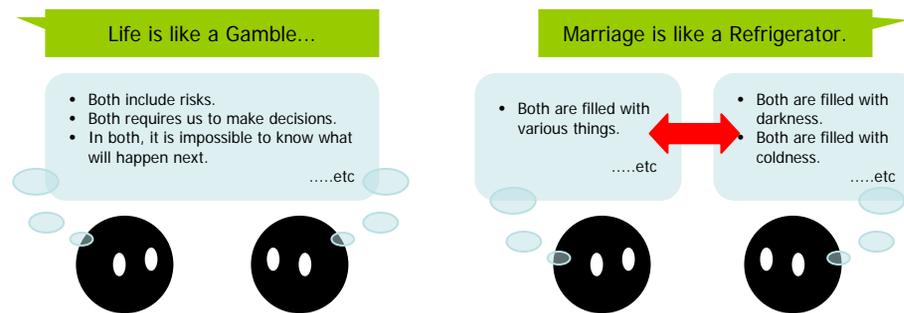## Introduction & Research Aims

■ Different interpretations structure: Familiar Metaphors and Unfamiliar Metaphors.

The purpose of this study is to examine the structure of the metaphor comprehension in individuals' comprehension. Our previous studies (Taira, Nakamoto, & Kusumi, 2007) showed that the structure of familiar metaphors is clearly different from the one of unfamiliar metaphors. While familiar metaphors are understood by an individual with many interpretations, unfamiliar metaphors are understood with less interpretations and shows different pattern of interpretations between individuals.

But, these results were only from offline describing data, we don't know whether we really produce more or less interpretations during metaphor comprehension. This study focused on this online problem of metaphor comprehension by using of text rereading paradigm.

Life is like a Gamble…

- Both include risks.
- Both requires us to make decisions.
- In both, it is impossible to know what will happen next.
  …..etc

Marriage is like a Refrigerator.

- Both are filled with various things.
  …..etc

- Both are filled with darkness.
- Both are filled with coldness.
  …..etc

Experiment-Method

■ Materials

5 Japanese familiar metaphors and 5 Japanese unfamiliar metaphors. They were embedded and presented in the related text. Each text was consisted of 14 sentences (see HANDOUT). The fifth sentence was metaphor expression itself. The sixth sentence was **the most metaphor-related sentence**, and the tenth sentence was **moderate metaphor-related sentence**.
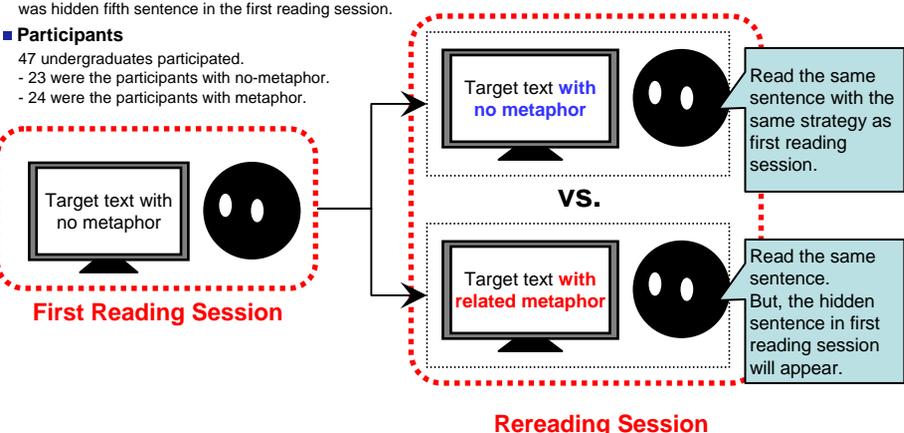
■ Procedure: Reading Test

Before the experiment started, the participants were instructed to read the given texts showed on the PC display as self-paced reading, but not to read lukewarmly for the recall test. After the instructions, the participants were required to read two practice texts as practice trials. Each practice text included one nonsense sentence (XXXXX). This was the hidden sentence which originally applies to the text. The participants were required to read the hidden sentence with imaging how the possible sentence could be embedded.

In the true trials, 10 texts with no metaphorical expression were presented (**First Reading Session**): We excluded the fifth sentence and alternatively presented nonsense word (XXXXX). The participants were not informed of second reading session and required to read them through. Immediately after the first reading session, the participants were required to reread the same 10 texts (**Rereading Session**). In this session, half the participants were presented the texts with no metaphor, and other half the participants were presented with the related metaphorical expression which was hidden fifth sentence in the first reading session.

■ Participants

47 undergraduates participated.
- 23 were the participants with no-metaphor.
- 24 were the participants with metaphor.

Target text with no metaphor

First Reading Session

Target text **with no metaphor** → Read the same sentence with the same strategy as first reading session.

VS.

Target text **with related metaphor** → Read the same sentence. But, the hidden sentence in first reading session will appear.

Rereading Session

Results & Discussion

■ The results of rereading effect

The reading time data of the target sentence (the sixth sentence: the **most metaphor-related** sentence; the tenth sentence: **moderately metaphor-related** sentence) were collected and divided by the mora of the target sentences. In the basis of this data, we got the differential value between the first reading session and the rereading session ("the reading time of first reading session" – "the reading time of rereading session"). This value means the largeness of the **rereading effect**; the larger the value gets, the participants can reread the same sentence faster.
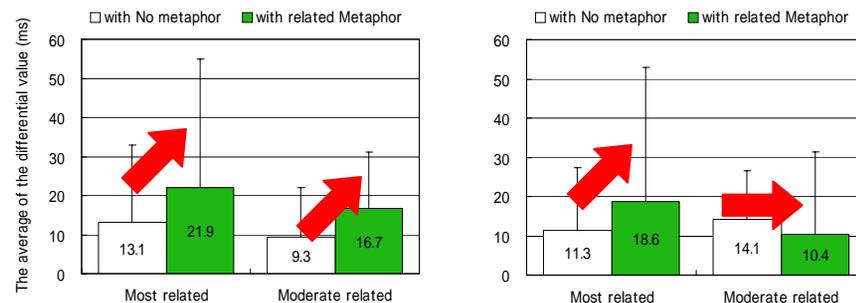

**Figure: The results of the average and SD of the differential value
(Left: familiar metaphor, Right: unfamiliar metaphor)**

A two-way ANOVA was conducted for Familiar metaphor and Unfamiliar metaphor.
- Rereading strategy: **with No metaphor vs. with related Metaphor**
- The sentence relatedness with metaphor: **the Most related sentence vs. the Moderate related sentence**

Familiar metaphor
Only the main effect of rereading strategy was marginally significant ($F (1, 45) = 3.00$, $p <.10+$). This means that **the participants with metaphor tended to reread the texts faster than the participant with no metaphor**. This effect could be observed only in the most and moderate metaphor-related sentences, not on the other sentences which appeared after the fifth metaphor sentence.

Unfamiliar metaphor
The interaction was significant ($F (1, 45) = 4.48$, $p <.05*$). Ryan's multiple comparison procedure revealed that **the participants with metaphor activated only the most metaphor-related interpretation more than the participants with no metaphor** ($F (1, 90) = 3.71$, $p <.10+$), but did not activate the moderate interpretation ($F (1, 90) = 0.16$, n.s.).

The difference between familiar metaphor and unfamiliar metaphor can be also examined by text comprehension experiment.
  - Familiar metaphor includes many interpretation in a individual.
  - Unfamiliar metaphor include only the most metaphor-related interpretation.

■ What can we discuss???

For the interpretation diversity of metaphor...
Interpretation diversity is also one of the important factors of similarity cognition and metaphor comprehension process (Utsumi & Kuwabara, 2005; Utsumi, 2007). Interpretation diversity in metaphor comprehension reflects the reason why the topic and the vehicle can be combined. That is, the more we can produce the interpretations, the more strongly we feel the topic similar the vehicle.
The result of this study can support Taira et al. (2007) and reveal the interpretation diversity for familiar metaphor.

For the strength of metaphorical meaning...
The similarity cognition is related with not only metaphor comprehension but also metaphor evaluation such as metaphor aptness and metaphor familiarity. Blasko & Connine (1993) investigate the correlation between the metaphorical meaning of the vehicle and the metaphor aptness and familiarity. They revealed that the vehicle of high apt and high familiar metaphor (e.g. THE ROCKET IS A BULLET) activates metaphor-related meaning (e.g. SPEED), but that the vehicle of moderate apt and low familiar metaphor (e.g. A GOOD PROFESSOR IS AN OASIS) does not activates metaphor-related meaning (e.g. FULFILING). Those results suggested the aptness and the familiarity of metaphor reflect the strength of metaphorical meaning. The strength of metaphorical meaning means whether the metaphor is understood or not. In this point, the similarity cognition and metaphor comprehension can be decided by how aptly the topic is expressed by the vehicle and how familiar and conventional the pair of the topic and vehicle is. In short, the aptness and the familiarity affect on the similarity (Chiappe & Kennedy, 2001; Gentner, Bowdle, Wolff, & Boronat, 2001; Jones & Estes, 2006).
The result of this study shows the efficiency of familiar metaphor for the metaphorical meaning.

How different are Familiar Metaphors from Unfamiliar Metaphors?

Tomohiro Taira & Takashi Kusumi

Graduate School of Education, Kyoto University
Correspondence concerning this presentation should be sent to Tomohiro Taira (mailto:sakusha@syd.odn.ne.jp).

Materials

* All materials are presented in Japanese for the participants.

■ **Familiar metaphors and interpretations**

Life is like a gamble.
- In the both, we cannot know what will happens next. (Most metaphor-related interpretation)
- The both depend on lucky. (Moderately metaphor-related interpretation)

Word is like a weapon.
- The both may hurt someone. (Most metaphor-related interpretation)
- The both control someone. (Moderately metaphor-related interpretation)

Sadness is like bottom of sea.
- In the both, we cannot see around because of darkness. (Most metaphor-related interpretation)
- We cannot reach the both. (Moderately metaphor-related interpretation)

Time is like money.
- The both are precious. (Most metaphor-related interpretation)
- The more we use the both, they will run out. (Moderately metaphor-related interpretation)

Love is like sickness.
- The both trouble us. (Most metaphor-related interpretation)
- In the both, we lose yourself. (Moderately metaphor-related interpretation)

■ **Unfamiliar metaphors**

Discussion is like a building.
- The both will pile up. (Most metaphor-related interpretation)
- The both are constructed by many people. (Moderately metaphor-related interpretation)

Knowledge is like an accessory.
- The both can be very important for us. (Most metaphor-related interpretation)
- The both can be shown off. (Moderately metaphor-related interpretation)

Marriage is like a refrigerator.
- In the both, various things or events are filled. (Most metaphor-related interpretation)
- In the both, things or events will go colder. (Moderately metaphor-related interpretation)

Alcohol is like a lover.
- The both can comfort us. (Most metaphor-related interpretation)
- We sometimes strongly depend on the both. (Moderately metaphor-related interpretation)

Scholastic ability is like money.
- The both are convenient for your life. (Most metaphor-related interpretation)
- The both are tools for your life. (Moderately metaphor-related interpretation)

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■ Utsumi, A. (2007). Interpretive diversity explains metaphor-simile distinction., *Metaphor and Symbol*, 22, 291-312.
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* All materials are presented in Japanese for the participants.

■ **Text Example: Text of "marriage is like a refrigerator"**

No	Sentence
1	After a long love, my old boyfriend and old girlfriend got married.
2	I had watched them for a long time, and I had been worried with their hesitant state. 2
3	I had wanted to introduce my friends as a best couple to my husband. 2
4	After half a year, I was informed of their marriage, and I was pleased as if it were my own.
5	**Then, she told me that their marriage was like a refrigerator.** — Metaphor expression
6	**Their life was filled with various events.** **2** — Most metaphor- related sentence
7	She called me and talked her freshly jealousy, his payday's extravagance.
8	I was really pleased with her and his good life. 2
9	I hoped that they would be with each other forever. 2 — Moderately metaphor-related sentence
10	**But I have guessed wrong and their life has gone cold.** **2**
11	Now I wonder why their life has gone like this. 2
12	Is it because their term when they had been with each other is so long?
13	Their cold life reminds me of their past love and life. 2 C D
14	Referring them, I decide that I gently treat my husband...but it's not all the time. 2