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Activation of topic and Vehicle in metaphor comprehension

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Research Points

- What is comprehended in metaphor comprehension?
  - "Your life is a gamble"
  - What is the meaning of "life" and "gamble" ?

- We investigate the activation of metaphor-relevant meaning…
  - in Topic aspect
  - in Vehicle aspect

Metaphor comprehension as…

1. Metaphor comprehension as categorization (Glucksberg & Keysar, 1990)

   - The topic of metaphor is comprehended as a proper example of vehicle group.

     - Life is a good example of gamble!!!

2. Metaphor comprehension as comparison (Gentner, 1983)

   - The topic and the vehicle are comprehended as similar with each other.

     - Life and gamble are similar with each other!!!

1. Categorization process

- Categorization process…? (Glucksberg, 2003; Gernsbacher et al., 2001)
  - the process in which the vehicle is dealt as the typical example representing the metaphor-relevant meaning.

- The categorization of vehicle increase in the basis of various factors.
  - Conventionality of vehicle (Bowdle & Gentner, 2005)
  - Apt combination between the topic and the vehicle (Jones & Estes, 2006; Utsumi, 2007)

Categorization and Vehicle

- Dual reference in categorization process
  - The vehicle of metaphor activates the metaphor-relevant meaning in metaphor comprehension (Blasko & Connine, 1993; Gernsbacher et al., 2001).

  - In contrast, the vehicle of metaphor suppresses metaphor-irrelevant meaning in metaphor comprehension (Gernsbacher et al., 2001; Glucksberg et al., 2001).

Categorization and Topic

- The meaning of topic is directly mapped from the vehicle…
  - At the time when the vehicle is comprehended as the metaphor-relevant meaning, the meaning of topic gets evident.
  - …because the topic is dealt as the good example of the vehicle.

- The meaning of topic is comprehended without any especial interference.

2. Comparison Process

- If the categorization process cannot happen…,
  - The conventionality of the vehicle is weak…
  - The combination between the topic and the vehicle is not apt…
- the comparison process is alternatively selected (Bowdle & Gentner, 2005; Jones & Estes, 2006; Utsumi, 2007).

- Comparison process is…
  - the process in which both the similarity between the topic and the vehicle is found.

Comparison and Vehicle

- The vehicle may fail to activate metaphor-relevant meaning.
  - Because categorization process do not happen.
  - The meaning of vehicle is decided by the comparison with the topic.

Comparison and Topic

- If the metaphor is comprehended as comparison process, two different predictions are possible.

  - The topic may activate the metaphor-relevant meaning.
    - The meaning of vehicle is not clear, so the topic must activate any meanings (c.f. McGlone & Manfredi, 2001).

  - In the same way of vehicle, the topic may not activate metaphor-relevant meaning.
    - The meaning of vehicle is not clear, so the meaning of topic is also unclear.

Summary and Hypothesis

- If the metaphor is comprehended as categorization process,
  - the vehicle may activate the metaphor-relevant meaning.
  - the topic may not so as the vehicle.

- If the metaphor is comprehended as comparison process,
  - the vehicle may not activate the metaphor-relevant meaning.
  - the topic may or not…?

Experiment

How to investigate the hypothesis?

- Priming Paradigm
  - The stimuli were presented auditorily.
  - "Life is a gamble."

- Meaningfulness Decision Task (MDT: Taira & Kusumi, 2006)
  - Participants judge whether the sentence composed by the subject and the predicate which were presented in order and separately was meaningful.
  - "Life" + "cannot tell what happens next"…?

Method: Experiment Design
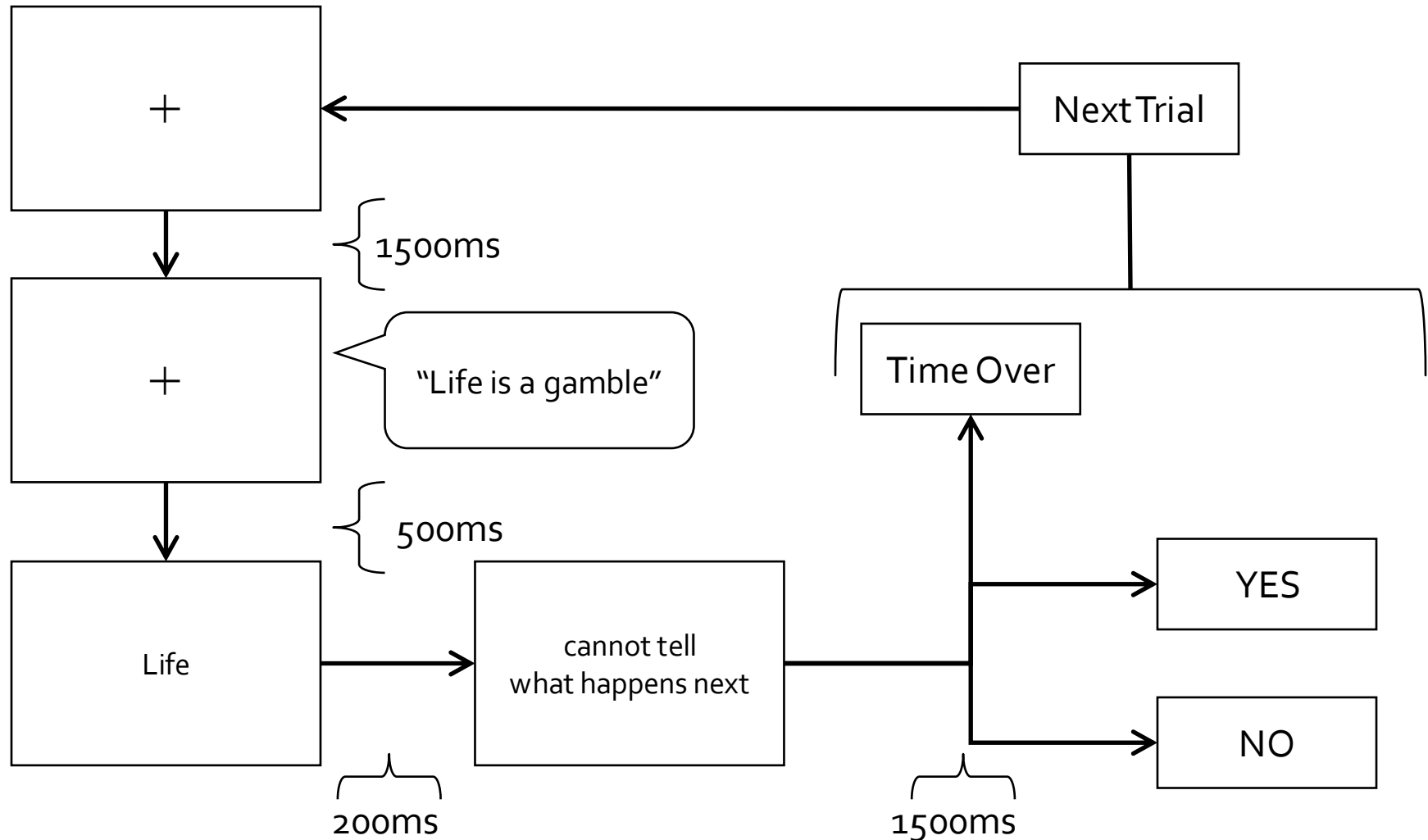
Method: Materials

- Priming Stimuli: 40 Japanese metaphors
    - 20 metaphors with High/Low conventional vehicle
    - 20 metaphors with High/Low apt combination between the topic and vehicle
    - Each metaphor includes metaphor-relevant meaning.

Table. 4 types of metaphor and its metaphor-relevant meaning

	High Conventional	Low Conventional
High Apt	Life is a gamble (cannot tell what happens next)	Responsibility is a load (heavily weighs on us)
Low Apt	Knowledge is an accessory (can be put on)	Alcoholism is a parasite (makes us ill)

Method: Materials

- Control stimuli: 80 literal sentences
  - The sentences in which the topic or the vehicle is used in a literal way.
  - Two literal sentences were made as the counterparts of one metaphor.
    - <u>Life</u> is the time. (Topic control)
    - A race horse is a <u>gamble</u>. (Vehicle control)

Method: Materials

- Judging meaning: 40 metaphor-relevant sentences.
  - They were presented in the MDT with the topic or the vehicle.
  - "Life"+"cannot tell what happens next"
  - "Gamble"+"cannot tell what happens next"

Method: Materials

- The importance rate of each metaphor-relevant meaning was
  - How important the metaphor-relevant meaning is for the topic/vehicle.
  - 5 rate scale (1: lest important - 5: most important)

  - Topic: M=3.50, SD=0.58
    - No significant difference between each condition
  - Vehicle: M=3.63 ,SD=0.73
    - (Strong correlation with the conventionality)

Method: Participants and Analysis

- 40 graduates & undergraduates participated.
  - They were all native Japanese speakers.

- Decision time data in MDT were analyzed.
  - The trials decided as not-meaningful pair were excluded from the analysis.
  - And more, the trials of the reaction time which exceeded from 2SDs from the mean were also excluded.
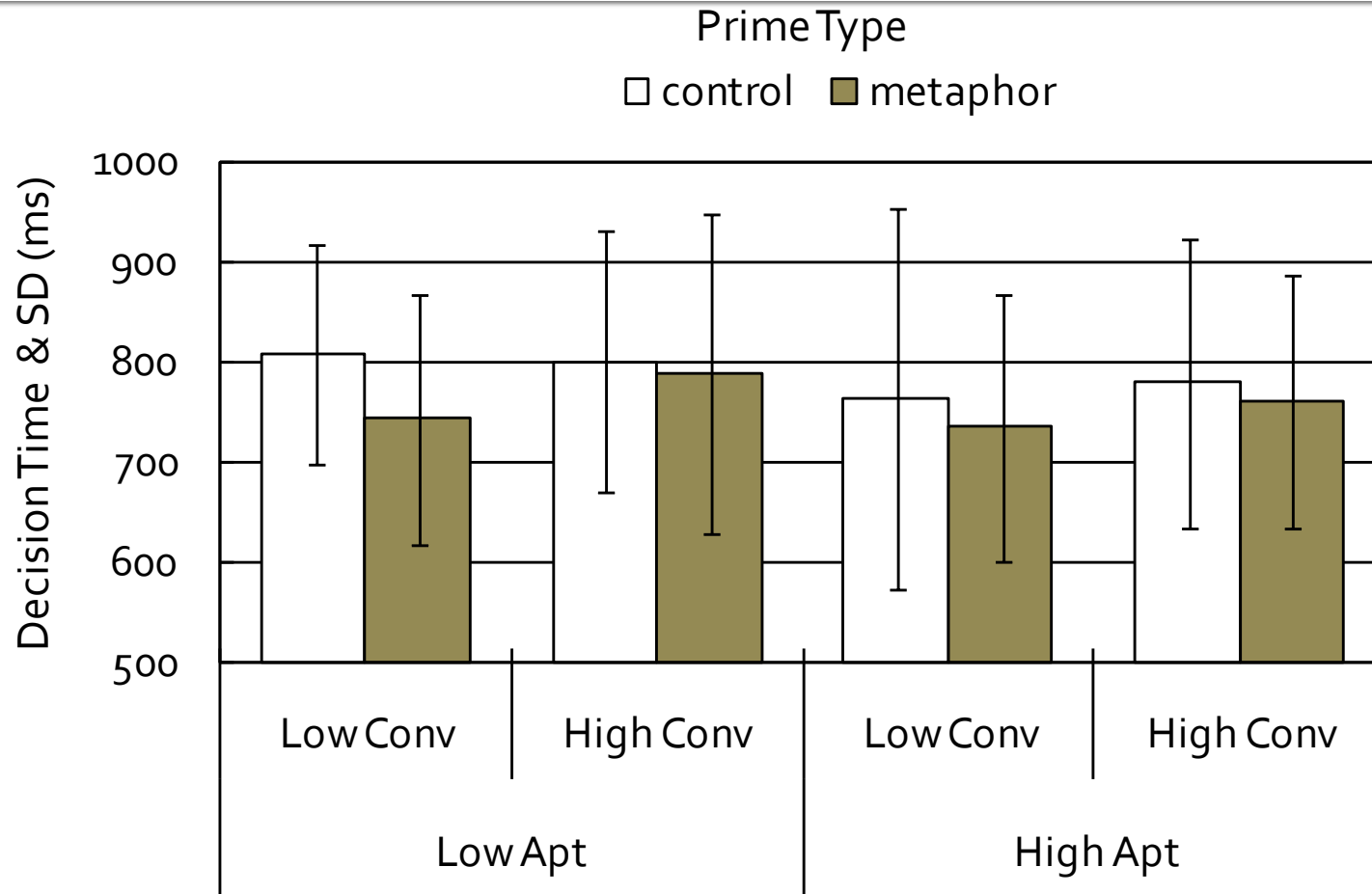
Results

ANOVA: Conventionality (High or Low) vs. Aptness (High or Low) vs. Prime Type (metaphor or control)

Results: Vehicle
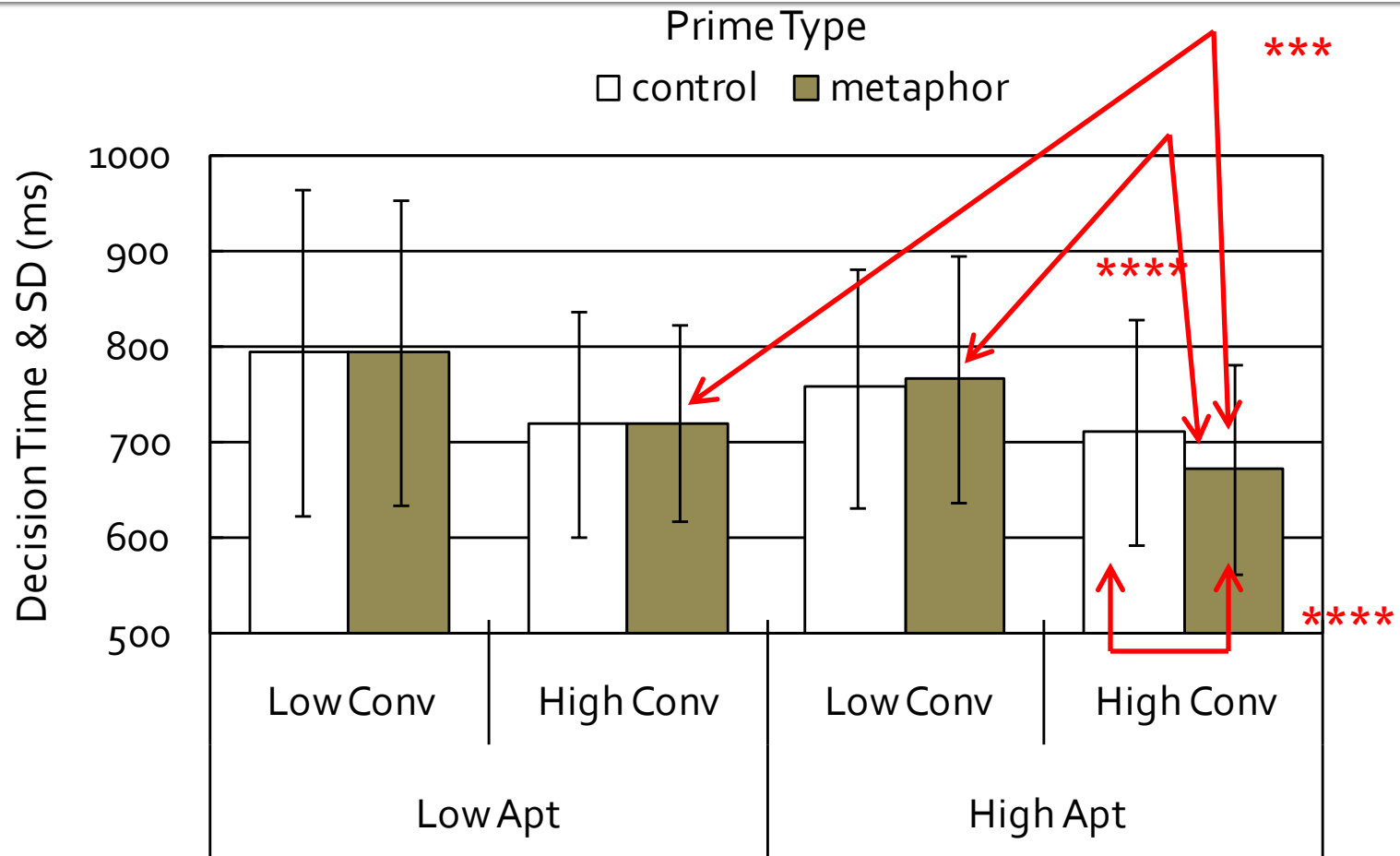
Interaction was significant ($F(1,38)=4.17$, $p<.05$)

Results: Topic

Main effects were significant: Conventionality ($F_{(1,39)}=8.83$, $p<.01$), Aptness ($F_{(1,39)}=25.47$, $p<.001$), Prime Type ($F_{(1,39)}=12.46$, $p<.005$). **The interaction was not significant ($F_{(1,39)}=0.36$, *n.s.*).**

Results: vs. Hypothesis

- If the metaphor is comprehended as categorization process,
  - the vehicle may activate the metaphor-relevant meaning.
  - the topic may not so as the vehicle.

- If the metaphor is comprehended as comparison process,
  - the vehicle may not activate the metaphor-relevant meaning.
  - the topic **activates the metaphor-relevant meaning.**

Summary

- The metaphor-relevant meaning in the vehicle is activated in the limiting condition.
  - Both the conventionality of vehicle and the aptness affect on the categorization of the vehicle.
  - This is the hybrid result of Bowdle & Gentner (2005) and Jones & Estes (2006).

- The less conventional and the less apt, the topic activates the metaphor-relevant meaning more.
  - The metaphors are hard to be comprehended!!!
  - The meaning of vehicle is not clear, so the topic must activate any meanings.

Next Scopes

- How about the metaphor-irrelevant meaning?
  - the vehicle of metaphor suppresses metaphor-irrelevant meaning in metaphor comprehension (Gernsbacher et al., 2001; Glucksberg et al., 2001).
  - May this results apply to all the metaphors?

  - it is shown that the topic of the metaphor hard to comprehend activates metaphor-relevant meaning.
  - If the topic must activate any meanings when the conventionality and aptness is weak, the metaphor-irrelevant meaning may be activated, too...?

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