**SUPPLEMENTARY MATERIAL**

Understanding ostensive behavior in making inferences of referential intentions

Harumi Kobayashi1, \*, Oga Kobori2, Yasuo Ihara3, Hiroyuki Yaguchi1, Tetsuya Yasuda1

1Tokyo Denki University, Hatoyama, Hiki-gun, Saitama, 350-0394, Japan

2Gradute School of Tokyo Denki University, Hatoyama, Hiki-gun, Saitama, 350-0394, Japan

3The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo, 113-0033, Japan

\*Author for correspondence (h-koba@mail.dendai.ac.jp)

***Letters on Evolutionary Behavioral Science***

**Experimental materials and conditions**

*Object selection*

The stimuli consisted of four sets of objects used by Kobayashi (2007) with a slight modification. In addition, we selected stimuli in which a variety of object parts could be considered. There were four different types of object parts: 1) nut set, the object was a U-shaped bolt (whole object) with a nut (part object) and a distractor; 2) spring set, the object was a plate hanger (whole object) with a spring (part object) and a distractor; 3) pump set, the object was a cylinder (whole object) with a pump (part object) and a distractor; 4) clip set, the object was a letter scale (whole object) with a clip (part object) and a distractor. The nut set and the pump set served as off the shelf items. The spring set and the clip set served as the handcrafted item. Each part name (e.g., nut) was replaced with nonsense words (e.g., *muta*).

*Stimuli in each condition*

The stimulus in each object set consisted of two video clips in order of a context phase and a training phase. There were four different conditions,1) Less-accessibility and facile pointing, 2) Less-accessibility and effortful pointing, 3) More-accessibility and facile pointing, 4) More-accessibility and effortful pointing. The participants were randomly assigned to one of these conditions; therefore we used between-participants design.

The participant first accessed the web page and agreed to the informed consent, then proceeded to watch the stimuli.

1. *Less-accessibility and facile pointing*

In the context phase, the experimenter first demonstrated twice that the cover was locked by trying to open it but failed (Figure 1a). Next, the experimented looked at the front as if making eye contact with the observer (the participant), then training phase followed. In the training phase, he pointed to the center of the object part (nut) using his forefinger tip directed toward the part while he looked down the cover (Figure 1b). Then, he said in Japanese: “Kore wa *muta* (i.e., nonsense word) desu” ("This is (a) *muta*") twice.

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| a) | テーブルの上に座っている男性  低い精度で自動的に生成された説明 | b) |  |
| Figure 1. Condition of Less-accessibility and facile pointing in the nut set |

1. *Less-accessibility and effortful pointing*

The procedure of this condition was identical with *1) Less-accessibility and facile* condition except that in the training phase, the experimenter pointed to the center of the object part (nut) using his forefinger tip while he forward-tilted and looked into the cover from the side of it (Figure 2b).

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| a) | テーブルの上に座っている男性  低い精度で自動的に生成された説明 | b) |  |
| Figure 2. Condition of Less-accessibility and effortful pointing in the nut set |

1. *More-accessibility and facile pointing*

The procedure of this condition was identical with *1)* *Less-accessibility and facile* condition except that in the context phase, the experimenter demonstrated opening the cover and moving it to the side of the experimental object, then returned the cover to the initial position (Figure 3a).

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| a) | 屋内, 人, カーテン, 持つ が含まれている画像  自動的に生成された説明 | b) |  |
| Figure 3. Condition of More-accessibility and facile pointing in the nut set |

1. *More-accessibility and effortful pointing*

In the context phase, the experimenter demonstrated that he opened the cover and moved it to the side of the experimental object then returned the cover to the initial position (Figure 4a). Next, the experimenter looked at the front as if making eye contact then followed the training phase. In the training phase, the experimenter pointed to the center of the object part (e.g., nut) using his forefinger tip while he forward-tilted and looked into the cover from the side of it (Figure 4b). Then, as other conditions, he said in Japanese: “Kore wa *muta* (i.e., nonsense word) desu” ("This is (a) *muta*") twice.

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| --- | --- | --- | --- |
| a) | 屋内, 人, カーテン, 持つ が含まれている画像  自動的に生成された説明 | b) |  |
| Figure 4. Condition of More-accessibility and effortful pointing in the nut set |

*Stimuli in each test*

The stimulus in each test consisted of three types of objects. The two types of tests use were an isolated test and a transfer test. In the isolated test, the stimulus (nut set) consisted of three objects: the nut (i.e., the object part), the U-shaped bolt (i.e., the object without the object part), and the distractor. One of the transfer tests consisted of three objects: the nut with the I-shaped bolt (i.e., the object part), the U-shaped bolt, and the distractor. The rationale for using a U-shaped bolt without an object part nut as “whole object” was as follows: if participants applied shape bias for object categories, they would consider the U-shaped bolt without the object part nut as a whole object, because the overall shape is similar to the original U-shaped bolt with nut. In the transfer test, the part embedded in another I-shaped object. Whether the participants thought the nut was the referent of the given name could be more explicitly confirmed.

Each participant was first tested using the isolated test after receiving the training phase. In the isolated test, the participant chose the referent for the uttered word (i.e., a nonsense word) from the three types of objects; the whole object without the object part (A), the object part (B), and distractor (C) (Figure 5a). The transfer test followed. In the transfer test, the participant chose the referent for the uttered word (i.e., the same nonsense word) from the three types of objects; the other-shaped object with the object part (A), the distractor (B) the whole object without the object part (C), (Figure 5b).

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| a) | 屋内, 座る, コンパクトディスク, 光 が含まれている画像  自動的に生成された説明 | b) | 屋内, 座る, 小さい, 光 が含まれている画像  自動的に生成された説明 |
| Figure 5. Stimuli in each test. a) isolated test, b) transfer test |

**Reference**

Kobayashi, H.（2007). The effect of touching object parts on learning novel object part names among young children and adults. *Studies in Language Sciences*, *6*, 61–76.

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