

# Does the Accessibility of Referents Impact Implicit Causality in Sentence Production?\*

Ryuta ISEKI and Takashi KUSUMI  
Kyoto University, Japan

e-mail: riseki@educ.kyoto-u.ac.jp



## [The Purpose of This Study]

We examined the **focus effects** on **both action and state verbs** in Japanese. We also demonstrated the importance of **semantic roles** in occurring the implicit causality bias.

## BACKGROUND

### [What is Implicit Causality?]

Some verbs show **preference to the sentence subject or object** as the subject of subsequent clause. Consider the following sentence competition task.

a. "Ken **blamed** John because he ..."

-> People tends to make the completion which use "he" as referring to *John* (**second noun phrase: NP2**).

b. "Ken **apologized** John because he ..."

-> People tends to make the completion which use "he" as referring to *Ken* (**first noun phrase: NP1**).

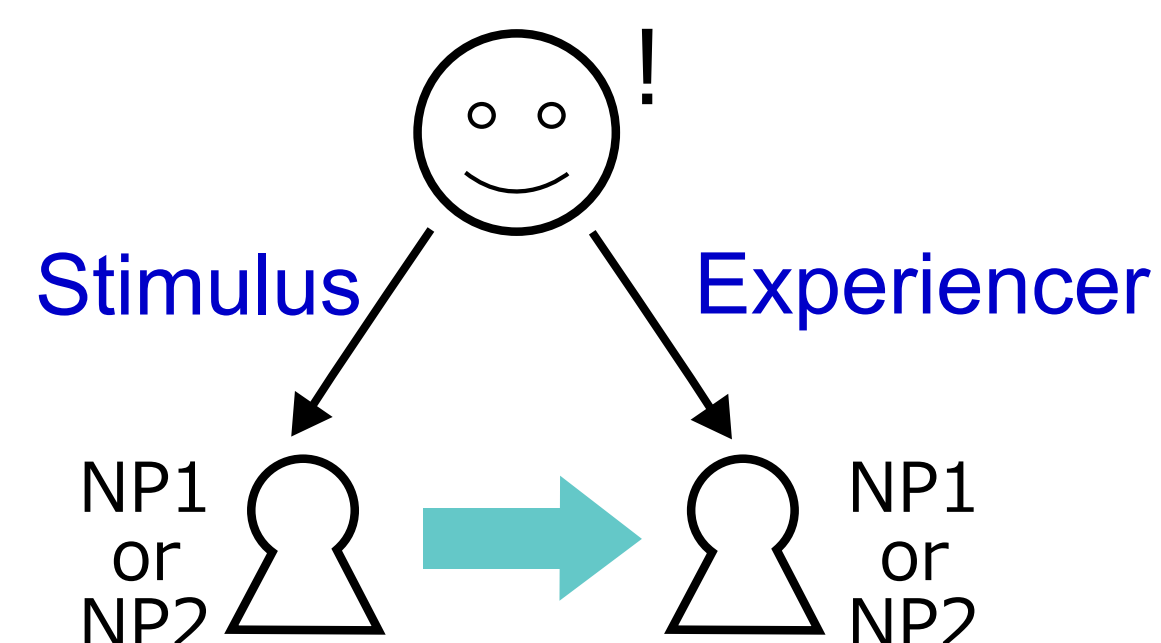
This preference is called **implicit causality**.

### [What Mechanisms Underlie Implicit Causality?]

Theorists distinguished **two types of implicit causality verbs** in terms of their **semantic roles** which are assigned to persons (Au, 1986; Brown & Fish, 1983; Rudolph & Försterling, 1997).

#### <State Verbs>

- mention **internal state**.
- have **two roles**.
- have two subtypes.
  - **SE (Stimulus-Experiencer)**: NP1-bias. e.g., bore, offend.
  - **ES (Experiencer-Stimulus)**: NP2-bias. e.g., respect, admire.



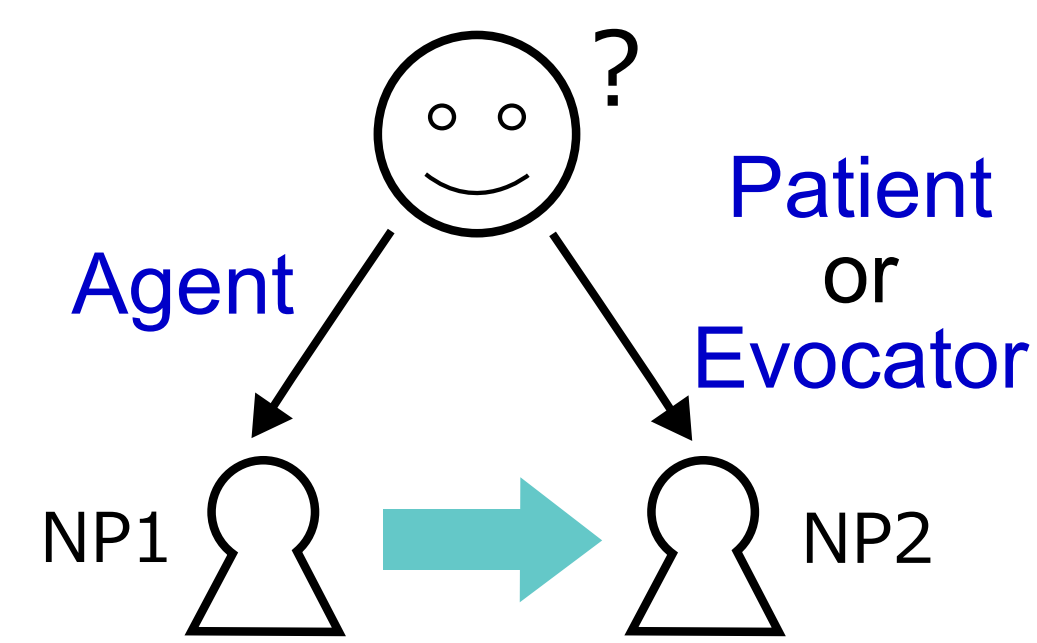
Both NP1 and NP2 are assigned to Stimulus and Experiencer roles.

The assignment is exclusive, so assigning the one role fixes the other role and is not influenced by focus.

Fukumura and van Gompel (2010) suggested that implicit causality is **independent to some focus effects**. However, they examined **only state verbs**.

#### <Action Verbs>

- depict **explicit actions**.
- have **three roles**.
- have two subtypes.
  - **AP (Agent-Patient)**: NP1-bias. e.g., apologize, betray.
  - **AE (Agent-Evocator)**: NP2-bias. e.g., blame, follow.



NP1 is always assigned to Agent Role; NP2 is probable to be assigned to Patient and Evocator roles.

The focus would affect the processes of determining the role of NP2 in action verbs.

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## RESULTS

\*In participants' response, reference to NP1 (sentence subject) versus NP2 (sentence object) were coded as "1" and "2", respectively. For mean scores, 2(focus) x 2(type: action or state verbs) x 2(bias: NP1- or NP2-bias) ANOVAs were conducted.

### Experiment A: NP2-Focused.

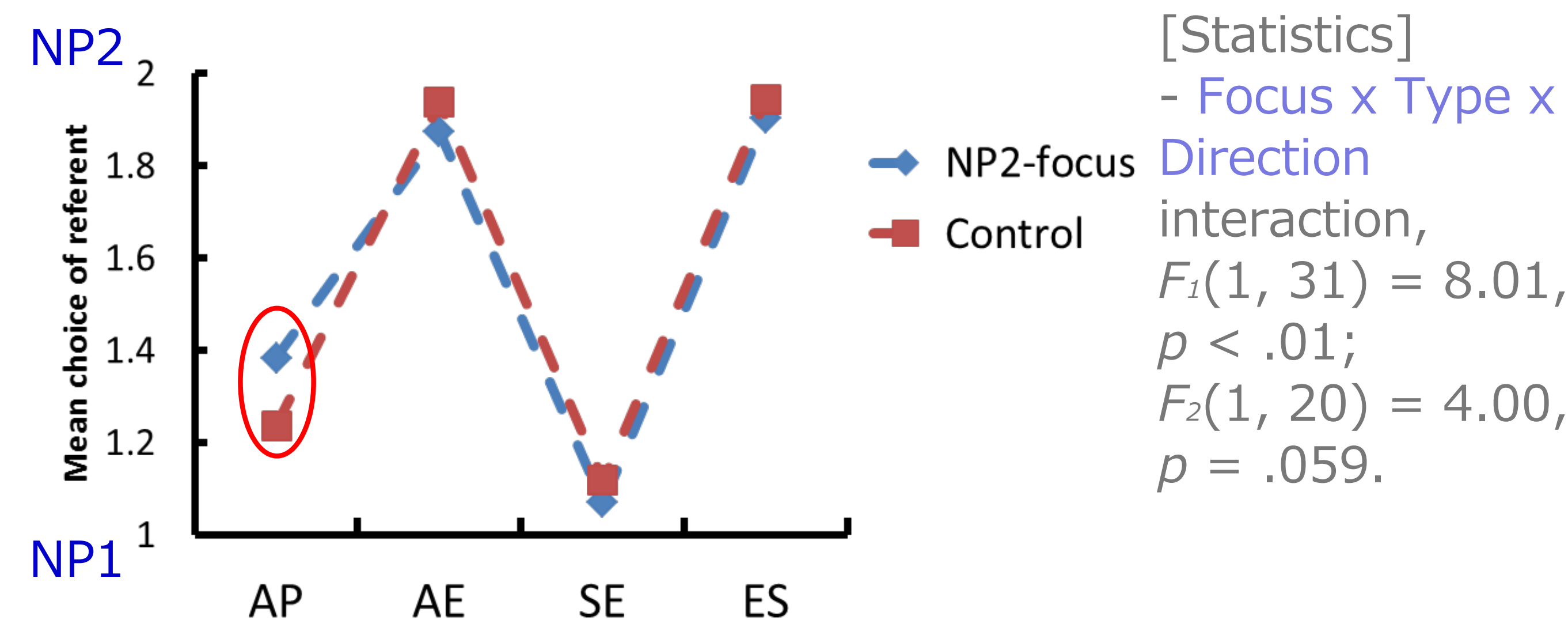


Figure 1. Mean choice scores of referent in Experiment A.

### [Only Focus Effects on AP verbs]

The mention to the sentence object (NP2) in prior sentence encouraged participants to select the object more frequently **only for AP-verb sentences**.

### Experiment B: NP1-Focused.

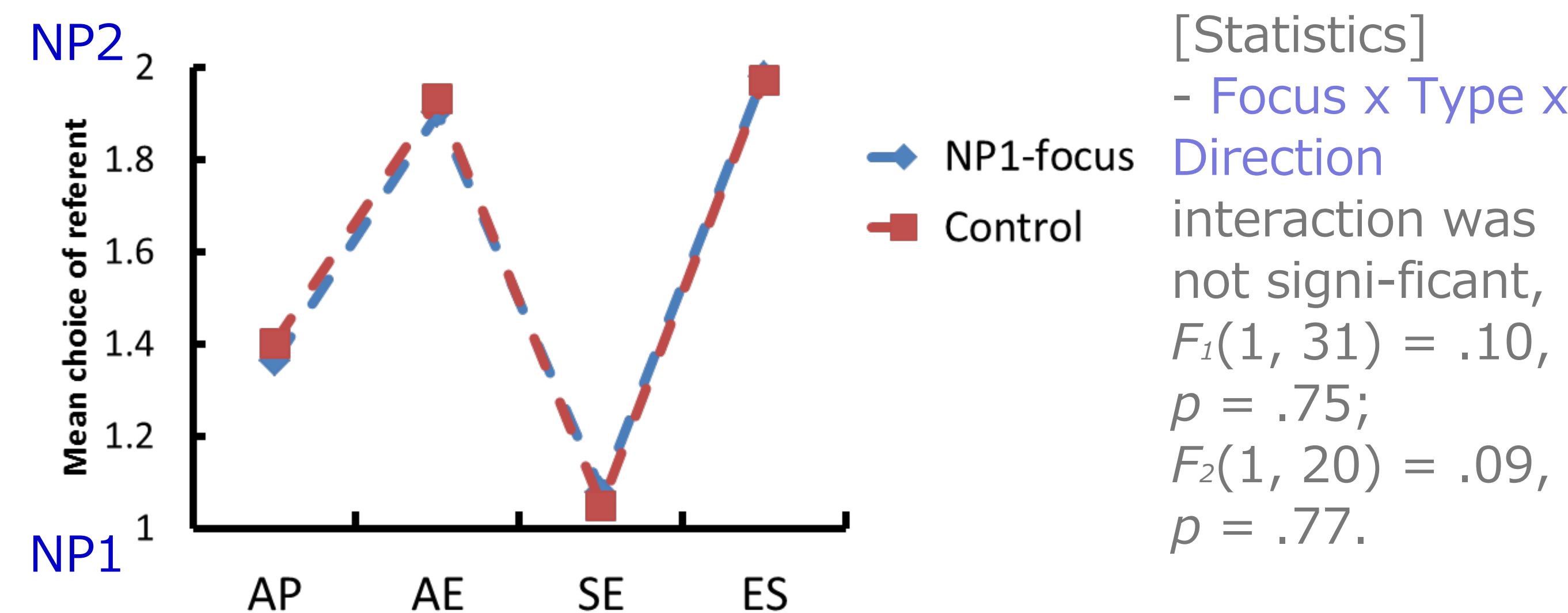


Figure 2. Mean choice scores of referent in Experiment B.

### [No Focus Effects]

The mention to the sentence subject (NP1) in prior sentence did not change the patterns of reference for **any types of sentences**.

## METHOD

### [Participants and Materials]

Each 34 adults participated in Experiment A and B. Twenty four verbs were used (each 6 for four category of the verbs).

### [Manipulation of focus]

Antecedent sentences referred to NP1, NP2, or nothing in the subsequent sentences, either.

- **NP2-focus** (Exp. A)

"John received unreleased stock information."

- **NP1-focus** (Exp. B)

"Ken received unreleased stock information."

- **Control**

"Unreleased stock information was spread."

### [Procedure: Sentence completion]

Example (English trans.):

- **Sentence 1** (NP2-focus, NP1-focus, or Control)  
"John received unreleased stock information."

- **Sentence 2**

"Ken betrayed John because **he** ..."

↑ Complete!  
e.g.,) "envied it."

Who is "he"?  
Circle the name of the character to whom you refer in the sentence produced.

## CONCLUSION

Implicit causality in **action and state verbs** would be due to **different mechanisms**.

- **Action verbs**: Sensitive to focus or contexts.

- **State verbs**: Independent to focus.

### References

- Au, T. K.-F. (1986). *Journal of Memory and Language*, 25, 104-122.  
Brown, R., & Fish, D. (1983). *Cognition*, 14, 237-273.  
Fukumura, K., & van Gompel, R. P. G. (2010). *Journal of Memory and Language*, 62, 52-66.  
Rudolph, U., & Försterling, F. (1997). *Psychological Bulletin*, 121, 192-218.

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### Abstract

In some sentences (such as “Ken blamed John because he . . .”) the pronoun is likely to be interpreted as referring to the object (John), whereas in others (such as “Ken apologized to John because he . . .”) it is interpreted as referring to the subject (Ken). This preference by the type of verbs is called implicit causality bias. Recently, Fukumura and van Gompel (2010) found that the bias did not change the selection of anaphoric expressions in a completion task and suggested that the bias is independent of the increased accessibility of referents. We investigated the opposite direction of the relationship between implicit causality and accessibility. In the completion experiment, the accessibility of referents was manipulated by antecedent sentences that referred to either subject in the subsequent sentence or none. The antecedent sentences did not affect the type of responses in four types of implicit causality verbs (i.e., agent–patient, agent–evocator, stimulus–experiencer, and experiencer–stimulus verbs).

### Author Contact Information

Ryuta ISEKI	-----	riseki@educ.kyoto-u.ac.jp
Takashi KUSUMI	-----	kusumi@educ.kyoto-u.ac.jp

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