

Expressing Ignorance in Japanese*

Workshop at Waseda Institute for the Study of Language and Information
Hitomi Hirayama (UC Santa Cruz)
hhirayam@ucsc.edu

1 Introduction

▷ The goal of this project: to account for the difference between contrastive *wa* (Kuno 1973, Hara 2006, Tomioka 2009) and *sukunakutomo* ‘at least’ as in (1-2), focusing on ignorance inferences derived from these lexical items.

- (1) [Taro]_F-wa kita.
Taro-TOP came
‘(At least) Taro came. ~> I don’t know who else came.
- (2) Sukunakutomo Taro-ga kita.
at least Taro-NOM came.
‘At least Taro came.’ ~> I don’t know who else came.

Two big questions:

- ▷ Are the processes to derive ignorance inferences the same between the two?
- ▷ In what way can we grasp their behavior?

I will answer these questions by looking at the results of 3 experiments.

- Experiment 1 — How do ignorance inferences behave under different kinds of QuDs?
- Experiment 2 and 3 — How do contexts affect the choice of lexical items?

The upshot of the paper:

- Ignorance inferences from *sukunakutomo* ‘at least’ in Japanese are obtained in a way that does not depend so much on the context.
~> *sukunakutomo* has disjunctive semantics.
- There is a context-sensitive component in the interpretation of the contrastive *wa*.
- The two interpretations of *wa* can be derived via the same mechanism:
In both cases, the speaker is implying other sub-questions that could be asked.

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2 Experiment 1

Question: How are ignorance inferences from *wa* and *sukunakutomo* sensitive to Question under Discussions (QuDs: Roberts (1996))?

Predictions

- If ignorance inferences can be obtained in various kinds of QuDs, it suggests that we need a way to derive ignorance inferences in a context-insensitive way.
- If ignorance inferences are obtained only in a particular context, it tells us the inferences are derived referring to some contextually available information.

Design: adapted from Westera and Brasoveanu (2014)

- 3×3 design
 - 3 types of QuDs: POLAR, HOW MANY, and WHAT
 - 3 types of quantifiers:
 - *wa*, Superlative (*sukunakutomo* ‘at least’), and Comparative (*izyoo* ‘more than’)
- Task: Self-paced reading & acceptability judgment
 - The context: conversation between a judge and a witness
 - **First screen:** A question from a judge
 - (3) a. Judge’s question: POLAR
sono ninyoo no uchi, { *sukunakutomo* 10 tai ga/ 10 tai *izyoo* ga/ 10 tai wa } oohiroma ni aruno o mikakemasita ka?
‘Did you see { at least 10 / more than 10 / 10-wa } of the dolls in the hall?’
 - b. Judge’s question: WHAT
oohiroma de nani o mikakemasita ka?
‘What did you see in the hall?’
 - c. Judge’s question: HOW MANY
sono ninyoo no uchi, nan tai ga oohiroma ni aruno o mikakemasita ka?
‘How many dolls did you see in the hall?’
 - **Second screen:** An answer from a witness (Self-paced reading)
 - (4) Witness’s answer
watasi wa sono ninyoo no uchi, { *sukunakutomo* 10 tai ga/ 10 tai *izyoo* ga/ 10 tai wa } oohiroma ni aruno o mikakemasita.
‘I saw { at least 10 / more than 10 / 10-wa } of the dolls in the hall.’
 - **Final screen:** Conclusion of the judge (Acceptability judgment, 5 point scale)
The judge’s conclusion: The witness does not know the exact number of the dolls.
Question: to what extent do you think this conclusion is justified?

2.1 Results of acceptability judgments for the judge's conclusion

- Task: to judge how justified the judge's conclusion is:
 - ▷ Judge's conclusion: The witness does not know the exact number.
 - ▷ Question: to what extent do you think this conclusion is justified?
 - 5: completely justified (it is reasonable to get ignorance inferences)
 - 1: not justified at all (it is not reasonable to get ignorance inferences)

1. *At least* answers

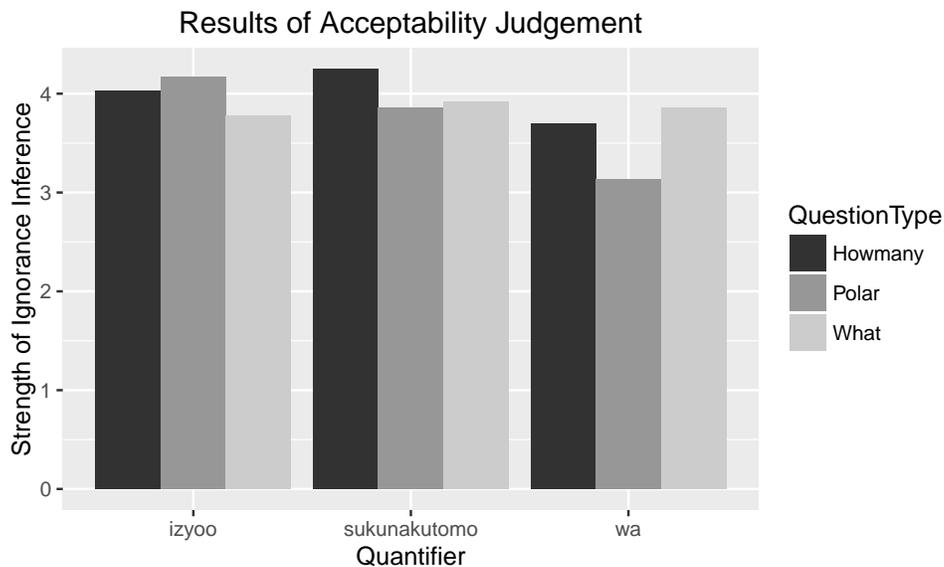
How many	Polar	What
4.25 (1.05)	3.86 (1.38)	3.92 (1.23)

2. *Wa* answers

How many	Polar	What
3.39 (1.37)	3.14 (1.55)	3.86 (1.25)

(3. *more than* answers)

How many	Polar	What
4.03 (1.1)	4.17 (1.0)	3.78 (1.29)



Results in a nutshell: *wa* and *sukunakutomo* are different.

- *Wa* generally derived weaker ignorance inferences than *sukunakutomo* 'at least'.
 - ▷ Even *how many* questions could not strengthen them enough.
- On the other hand, *sukunakutomo* induced strong ignorance inferences in all types of QuDs unlike English *at least*.

3 An account of the results of Experiment 1: Flexibility of *wa*

- Contrastive *wa* can be interpreted in two ways:

(5) [F10-nin]-*wa* kita.

10-CL-WA came

‘10 people-*wa* came.’

1. And I don’t know exactly how many people came. (ignorance, non-exhaustive)
2. And other 15 people did not come (fully knowledgeable, contrastive reading)

- *Sukunakutomo* ‘at least’ is always unambiguous: it indicates the speaker’s uncertainty.

↪ It is optimal to use *sukunakutomo* when the speaker expresses uncertainty.

This could be why <i>wa</i> only induces weaker ignorance inferences than a superlative.

4 Experiment 2-3: How does context affect the choice of lexical items?

Question: How do contexts (knowledge/contrast) affect the choice of particular particle/expression?

Predictions for Experiment 2: *ga* vs. *wa*

- If people are sensitive to knowledge of the speaker, *wa* is dispreferred whenever the context suggests she has full knowledge.
- If people are sensitive to a contrast made salient in the context, *wa* is preferred to *ga* in such a context.

Predictions for Experiment 3: *sukunakutomo* vs. *wa*

- If people are sensitive to knowledge of the speaker and the two-sided meaning of *wa*, *sukunakutomo* ‘at least’ would be preferred when the speaker is supposed to be ignorant.
- If people are sensitive to a contrast made salient in the context, *wa* is preferred to *sukunakutomo* in such a context, because *sukunakutomo* has no function to make a salient contrast.

Design

(i) CONTEXT: 3 types

1. IGNORANCE

There was a social gathering of a lab. Taro wanted to attend, but due to schedule conflict, he just went to the venue a little before it got started and said hello to people who were there and left. Next day, Hanako, Taro’s friend, ran into Taro and asked ‘How many people were there at the social gathering yesterday?’

2. CONTRAST: The speaker is fully knowledgeable, and there is a contrast in a context

There was a social gathering of a lab and Taro was the organizer and counted how many people actually came and how many did not. Taro’s friend, Hanako, ran into him and asked ‘How many people came to the social gathering yesterday?’

3. INCOMPATIBLE (with *wa*; the speaker is fully knowledgeable and there is no contrast in the context)

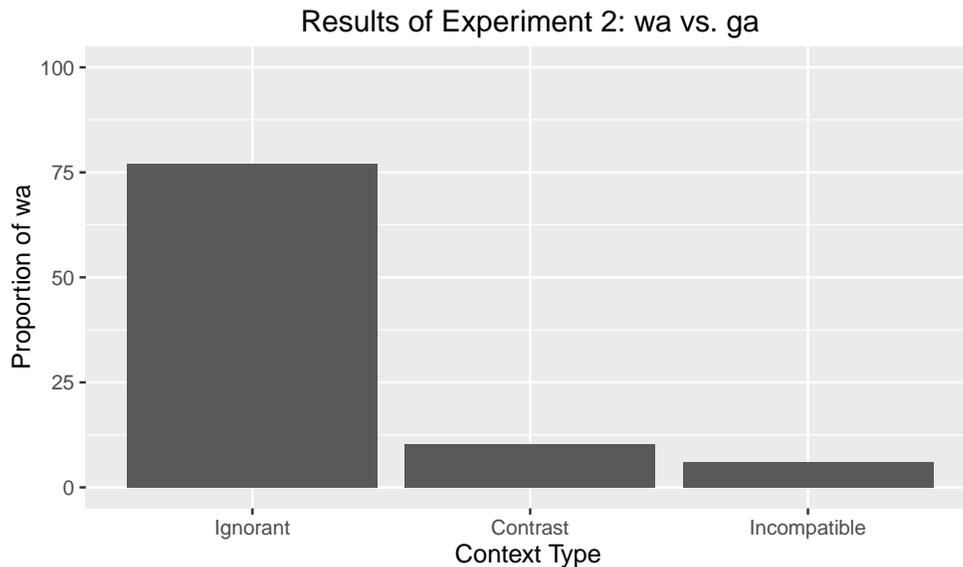
There was a social gathering of a lab and Taro was the organizer and counted how many people actually came. Taro's friend, Hanako, ran into him and asked 'How many people came to a social gathering yesterday?'

(ii) PARTICLE: *wa* OR *ga* OR *sukunakutomo*/*wa*

- Task: forced-choice task
 - One of the contexts above was shown with two possible answers (*wa/ga*). Participants were asked to choose the answer that sounded more natural.

4.1 Results

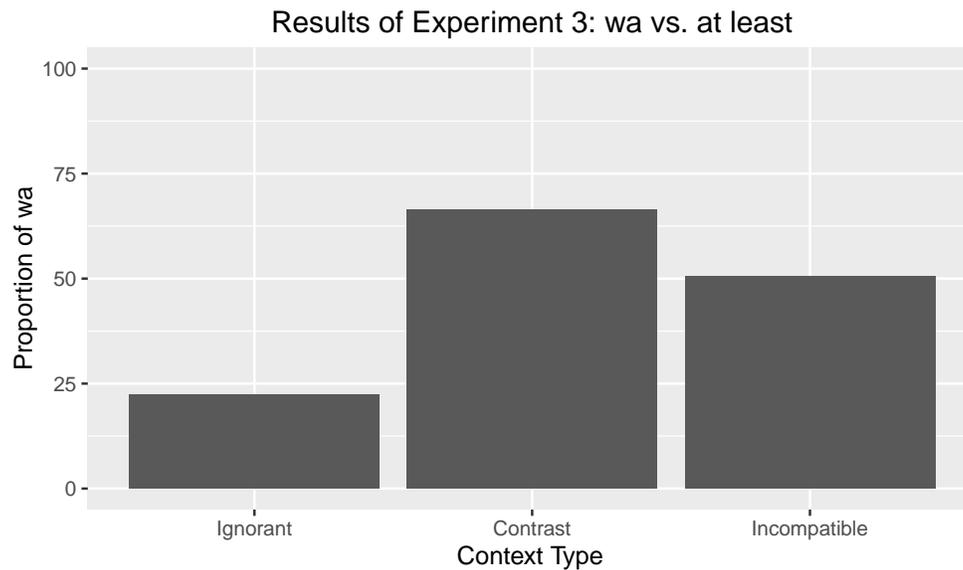
Experiment 2: *wa* vs. *ga*: 88 participants, and 16 of them are excluded.



Results of Experiment 2

- People are sensitive to ignorance inferences delivered by *wa*.
- For some people, contrasts available in the context can promote the use of *wa*. Note that *ga* is felicitous as long as the speaker has full knowledge.

Experiment 3: 59 participants and 12 of them were excluded.



Results of Experiment 3

- When it comes to a competition between *wa* and *sukunakutomo*, people pay attention to contextually available contrast.
- In expressing ignorance, *sukunakutomo* 'at least' is preferred, since this lexical item does not have multiple interpretations.

The upshot of Experiment 2-3:

- ▷ People are sensitive to the contextual information regarding:
- Speaker's knowledge
 - Contrast

5 Discussions and proposals

From Experiment 1-3, we have learned:

- *Ga* imposes exhaustive interpretations. The speaker should be knowledgeable.
- *Sukunakutomo* ‘at least’ induces fairly strong ignorance inferences in any kinds of contexts.
- Ignorance inferences from *wa* are not always available. Contextually available contrast can license *wa*.

5.1 Proposal: *ga* and *sukunakutomo* ‘at least’

5.1.1 *ga*: existential quantification

(6) 10 people-GA came.

$\exists x.\text{people}(x) \wedge 10(x) \wedge \text{came}(x)$

The ‘exactly 10’ interpretation comes from Gricean reasoning.

5.1.2 *sukunakutomo* ‘at least’: disjunction

- I adopt the denotation of *at least* from Büring (2007):

(7) at least 10 people-GA came.

at least 10 $[\lambda d[[_{\text{AP}} d\text{-many}] \text{people came}]]$

$10 = \max(\lambda d. d\text{-many people came}) \vee 10 < \max(\lambda d. d\text{-many people came.})$

- The disjunction suggests that the speaker thinks both conjuncts are possible.
 \rightsquigarrow Context-independent ignorance inferences

▷ Note that *ga* and *sukunakutomo* are truth-conditionally the same, but they are different with regard to not-at-issue inferences.

5.2 *wa* as contrastive topic

- We have seen that contrastive *wa* has access to a complicated discourse structure.
- The discourse structure that English contrastive topic (CT) uses is similar to what *wa* have access to.
▷ **How are they similar and different?**

5.2.1 English contrastive topic

- I will adopt the analysis of English contrastive topic in Büring (2003).

Observations:

- English contrastive topic has B-accent, which is distinct from focus (Jackendoff 1972).
- According to Büring, contrastive topic in English indicates strategies to resolve QuDs.

(8) Who ate what?

- a. A: What about Fred? What did he eat?
 B: FRED_{CT} ate BEANS_F. [person by person strategy]
- b. A: What about beans? Who ate them?
 B: FRED_F ate BEANS_{CT}. [food by food strategy]
- (9) A: What did pop stars wear?
 B: The FEMALE_{CT} pop stars wore CAFTANS_F.
 [Referring to an implicit (sub-)question]

Analysis:

- Answers with CT are felicitous as long as the CT-value (a set of questions), which is derived via the algorithm in (10), (i) has the QuD as a member or (ii) can be subsumed under the big super-question.

(10) CT-value formation

Step 1: Replace the focus with a *wh*-word and front the latter; if focus marks the finite verb or negation, front the finite verb instead.

Step 2: Form a set of questions from the result of step 1 by replacing the contrastive topic with some alternative to it.

- As we can see in (10), it is assumed that CT accompanies Focus in most cases. In German, it is impossible to have only CT in a sentence. In English it is possible with polar questions like (11) below:

(11) Can Jack and Bill come to tea? - BILL_{CT} can.

- It is also assumed that CT in English only occurs with declaratives.

5.2.2 Japanese contrastive *wa*: data and observations

Similarities

- Japanese CT can also indicate strategies to resolve QuDs as English CT does.

(12) Taroo-wa? Nani-o tabeta?
 Taro-TOP what-ACC ate
 ‘What about Taro? What did (he) eat?’
 a. TAROO_{CT}-wa MAME_F-o tabeta.
 Taro-*wa* beans-ACC ate
 Taro ate beans.

(13) Mame-wa? Dare-ga tabeta?
 beans-TOP who-NOM ate
 ‘What about beans? Who ate them?’
 a. MAME_{CT}-wa TAROO_F-ga tabeta.
 beans-*wa* Taro-NOM ate
 Taro ate beans.

- (14) poppu-staa-wa nani-o kiteta no?
 pop star-wa what-ACC wore Q
 ‘What did pop stars wear?’
- a. ONNA-no poppu-staa-wa_{CT} KAFUTAN_F-o kiteita yo.
 female-GEN pop star-wa caftan-ACC wore
 The female pop stars wore caftans.

Differences

- Japanese contrastive *wa* is different from English CT in that an NP marked with *wa* can be a focus (not given).
 ~> It means CT can appear in a sentence on its own.

- (15) a. dare-ga kimasita ka?
 who-NOM came Q
 ‘Who came?’
- b. [_FTaro]-wa kimasita.
 Taro-wa came
 ‘Taro came.’

- Japanese contrastive *wa* can appear in various kinds of sentence types.

(16) *Interrogative*

Taro-wa [_Fmame]-wa tabeta no?
 Taro-wa beans-wa ate Q
 Did Taro eat (at least) beans?

(17) *Imperative*

[_Fudon]-wa tabe-ro
 udon-wa eat-IMP
 Eat udon (at least).

5.2.3 Modification and analysis

- **What does *wa* do?**
 ▷ It indicates there are sub-questions and therefore the *wa* answer is a partial answer.
- Putting *wa* with non-declarative sentences aside, the behavior of *wa* we observed in the experiment is captured once we modify the algorithm of deriving CT-value.

(18) CT-value formation with $[[\alpha\text{-}wa\ P]]$ in Japanese

Step 1: Replace the focus with a *wh*-word if any;

if only one CT is available in the sentence, change it into a *wh*-word.

Step 2-1: If a CT is not changed into *wh*, form a set of questions from the result of step 1 by replacing the contrastive topic with some alternative to it.

Step 2-2: If a CT is changed into *wh*, form a set of questions so that they obey the following constraints:

They refer to $\bar{\alpha}$ (a complement set of α , an element which *wa* is attached to), and those sub-questions and the question made at step 1 can be subsumed by a QuD retrievable from the context.

- Given this, we can get how *wa*-answers are interpreted.

(19) Interpretation of $\llbracket \alpha\text{-}wa\ P \rrbracket$

- $\llbracket \alpha\text{-}wa\ P \rrbracket$ answers are felicitous when the question is a member of CT-values generated by the algorithm (18) or a super-question of them.
- Asserting $\llbracket \alpha\text{-}wa\ P \rrbracket$ implies the speaker is merely answering a sub-question: there is another strategy (a way of questioning) to resolve a super-question (QuD in the context).
 - By doing this, the speaker can steer the conversation in a certain direction so that she or her addressee can pay attention to sub-questions.

5.2.4 How it works

- The apparent two-sided meaning is derived via different processes of making sub-questions as shown in (20-22):

(20) CT value of $\llbracket 10\text{-people}_{CT}\text{-}wa\ \text{came} \rrbracket$:

↪ *How many people came?* (via step 1)

↪ Other sub-questions are generated depending on a possible QuD in the context

(21) $\llbracket 10\text{-people}\text{-}wa\ \text{came} \rrbracket$ in a context where the speaker is fully knowledgeable

- $\llbracket 10\text{-people}\text{-}wa\ \text{came} \rrbracket$ is not a complete answer to the QuD to the speaker.

→ Possible sub-question: *How many did not come?*

(Are there any individuals in $\bar{\alpha}$ who did not come?)

↪ This could be subsumed one super-question: *How many people came and how many did not?*

▷ **The speaker is assuming this could be the QuD to be resolved.**

↪ It suggests there are other people who did not come.

(22) $\llbracket 10\text{-people}\text{-}wa\ \text{came} \rrbracket$ in a context where the speaker is not knowledgeable

- Again, $\llbracket 10\text{-people}\text{-}wa\ \text{came} \rrbracket$ is not a complete answer to the speaker.

- The explicit question asked to the speaker (of *wa*) is now a super-question.**

▷ *super-question*: Q_1 : How many people (actually) came?

↪ The speaker cannot answer this due to lack of knowledge.

▷ *sub-question* q_1 answered: **As far as you know**, how many people came?

▷ *sub-question* q_2 implied: Were there any other people ($\bar{\alpha}$) who might have come, too?

↪ The speaker suggests it is possible to ask the implied sub-question to resolve the super-question $Q_1=(q_1 \& q_2)$.

▷ The speaker's knowledge is partial.

6 Conclusion and future work

- In this paper, I showed the results of a series of experiments that indicate
 - Ignorance inferences from *wa* are context sensitive and generally weaker.
 - Ignorance inferences from *sukunakutomo* ‘at least’ are available throughout all kinds of the context.
 - What determines the availability of *wa* is contextually available information regarding possible sub-questions.
- For future work, I need to modify the algorithm to generate CT values so that it can be applied to other sentence types (interrogatives, imperatives, etc.)
- In addition, the difference between *wa* and *sukunakutomo* identified in this paper can account for their different behavior in other grammatical constructions.
 - One of them is their behavior with respect to negative islands (Schwarz and Shimoyama 2010): **Only *wa* can obviate negative island.**
 - (23) a. * doredake nagaku taizai simasen desita ka?
how many stay didn’t COP Q
(lit.) ‘How long did you not stay there?’
 - b. [_F doredake nagaku]-wa taizai simasen desita ka?
how long-wa stay didn’t COP Q
‘What is the minimum length such that you did not stay there?’
 - c. *? sukunakutomo doredake nagaku taizai simasen desita ka?
at least how many stay didn’t COP Q
(Intended:) ‘What is the minimum length such that you did not stay there?’
 - We have seen that specific contexts are necessary to license the use of *wa*: there should be some contrast.
 - In addition, negative questions are marked (Farkas and Roelofsen 2017), and therefore they also require a marked context.
 - ▷ We can conclude that only *wa* can work as a scale aligner.

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