

Relative clause island effects in L1 and L2 Japanese

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Background: English *wh*-questions

Relative clause (RC) island (Ross, 1967):

Wh-extraction out of an RC is ungrammatical
(subtype of a complex NP island)

- (1) a. John saw [the girl [that ___ bought an apple]].
b. * **What** did John see [the girl [that ___ bought <what>]]?

Background: English *wh*-questions

Wh-movement out of non-islands is grammatical

(2) a. John said [that Sara bought an apple].

b. **What** did John say [that Sara bought <what>]?

Background: Japanese *wh*-questions

Similar island effects are not observed in *wh-in-situ* languages
(Choe, 1987; Huang, 1982; Nishigauchi, 1986, 1990)

(3) a. Taro-wa [[___ ringo-o katta] onnanoko]-o mimashita.
Taro-TOP [[apple-ACC bought] girl]-ACC saw
'Taro saw [the girl [that ___ bought an apple]].'

b. Taro-wa [[___ **nani**-o katta] onnanoko]-o mimashita ka?
Taro-TOP [[what-ACC bought] girl]-ACC saw Q
'What did John see [the girl [that ___ bought <what>]]?'

Background: Japanese *wh*-questions

Naze 'why' *in-situ* inside an RC is ungrammatical (Nishigauchi, 1986, 1990; Richards, 2008)

- (4) *Kimi-wa [[kare-ga __ **naze** kaita] hon]-o yomimashita ka?
you-TOP [[he-NOM __ why wrote] book]-ACC read Q
'Why did you read [the books [that he wrote __ <why>]]?'
(Nishigauchi, 1986, p. 54, (60))

- (5) ***Why** did you read [the books [that he wrote __ <why>]]?

Background: RC islands in L2 research:

L1 = *wh-in-situ*; target language (TL) = *wh*-movement

Study	L1	RC island violation results
Bley-Vroman, Felix, & Ioup (1988)	Korean	71%–92% rejection
Johnson & Newport (1991)	Chinese	Higher rejection rate of RC island violations than that of other island violations; age of arrival effect
White & Juffs (1998)	Chinese	86% rejection
Pérez-Leroux & Li (1999)	Chinese	Intermediate: 74%–86% rejection Advanced: 88%–94% rejection
Cunnings et al. (2010)	Chinese	Sensitivity in eye movements
Jung (2017)	Chinese Korean	Sensitivity in eye movements

Background: RC islands in L2 research:

L1 = *wh*-movement; TL = *wh-in-situ*

- No research (Belikova & White, 2009)

- Research question:

Can adult L1-English L2 learners (L2ers) of Japanese come to know that RCs with an *in-situ wh*-question are possible in Japanese, despite the ungrammaticality of their L1 counterparts?

Full Transfer/Full Access

(Schwartz & Sprouse, 1996)

- Full Transfer:
L2 initial state = L2ers' L1 grammar
- Full Access:
Subsequent development constrained by UG

In the case of L1 = *wh*-movement, TL = *wh-in-situ*:

- L2 initial state instantiates the island effects in the L2ers' L1
- Convergence on the target grammar comes later in development

Current study: Crossed factorial design

Acceptability Judgment Task with a 2×2 crossed factorial design (Sprouse, Wagers, & Phillips, 2012)

- Embedded clause type (EMBEDDED)
 - RC [+RC]
 - complement *that*-clause [-RC]
- Question type (QUESTION)
 - *wh*-question [+WH]
 - *yes/no*-question [-WH]

Current study: Crossed factorial design

(6) a. **Critical:** [+RC, +WH]

Taro-wa [[___ nani-o katta] onnanoko]-o mimashita ka?
Taro-TOP [[___ what-ACC bought] girl]-ACC saw Q
'What did Taro see [the girl [that ___ bought <what>]]?'

b. **Control 1:** [+RC, -WH]

Taro-wa [[___ ringo-o katta] onnanoko]-o mimashita ka?
Taro-TOP [[___ apple-ACC bought] girl]-ACC saw Q
'Did Taro see [the girl [that ___ bought an apple]]?'

c. **Control 2:** [-RC, +WH]

Taro-wa [Hanako-ga nani-o katta]-to iimashita ka?
Taro-TOP [Hanako-NOM what-ACC bought]-COMP said Q
'What did Taro say [that Hanako bought <what>]?'

d. **Control 3:** [-RC, -WH]

Taro-wa [Hanako-ga ringo-o katta]-to iimashita ka?
Taro-TOP [Hanako-NOM apple-ACC bought]-COMP said Q
'Did Taro say [that Hanako bought an apple]?'

Current study: Crossed factorial design

Figure 1. Linearly additive effect

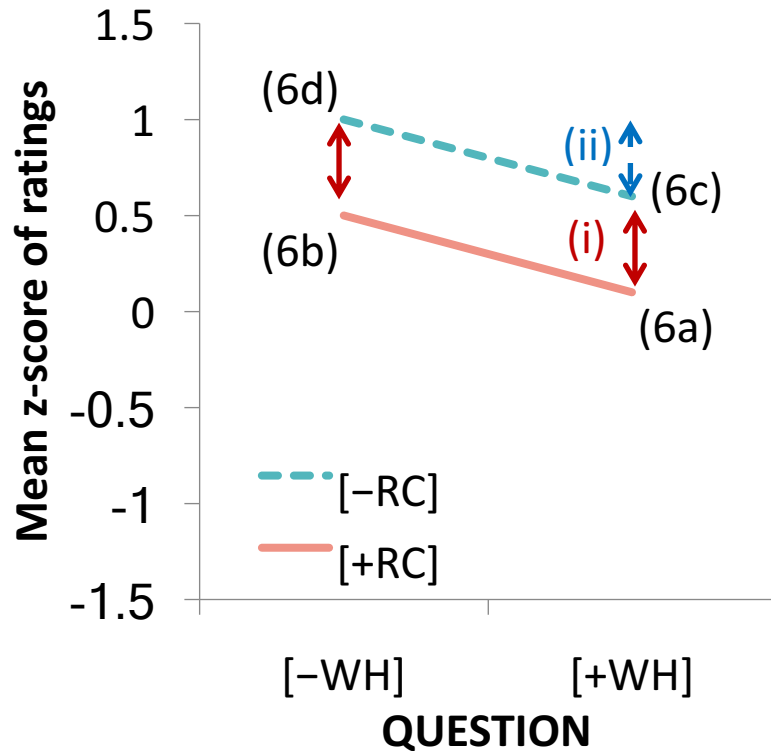
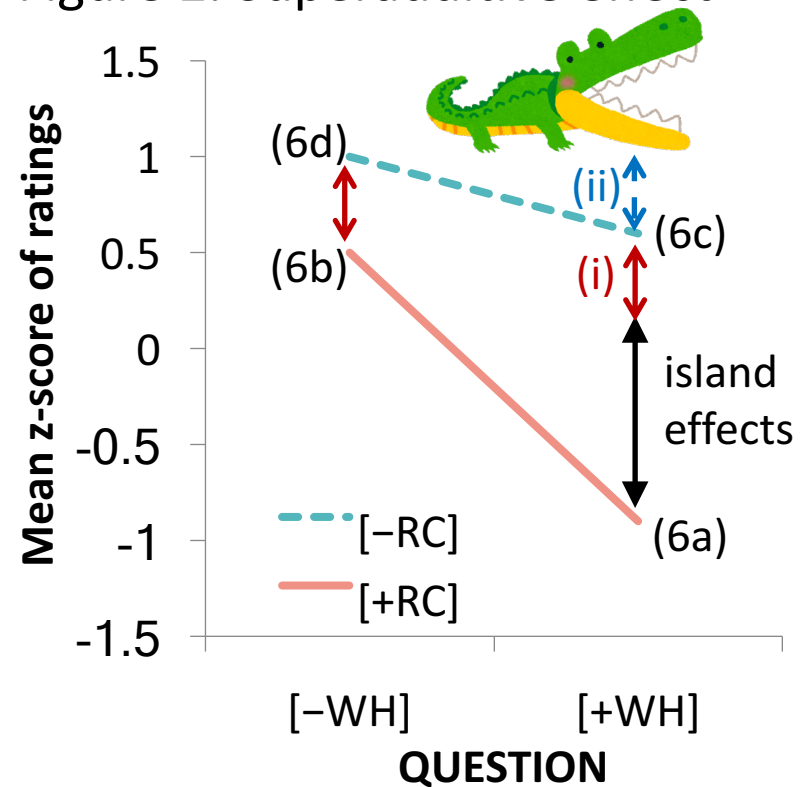


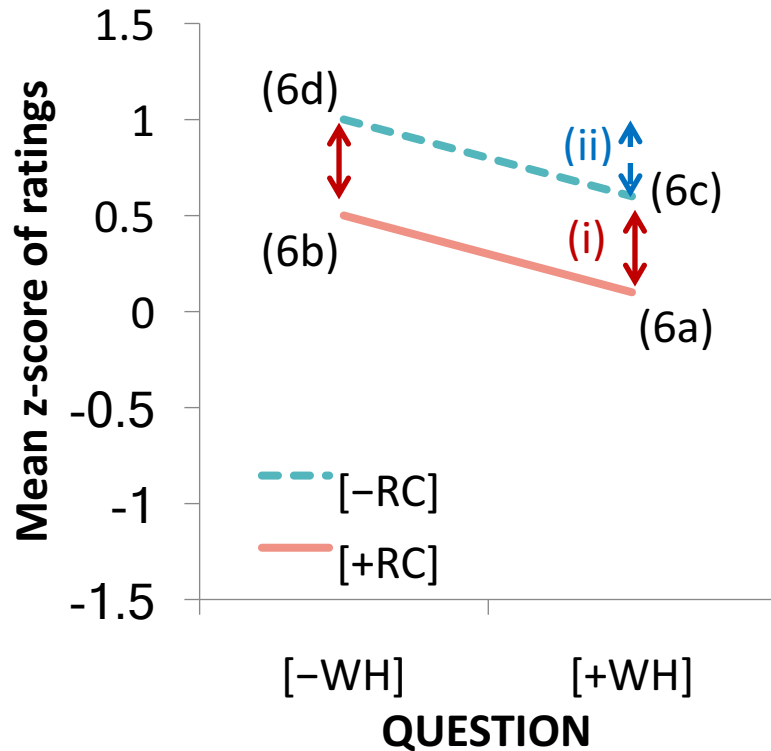
Figure 2. Superadditive effect



- (i) Difference between complement *that*-clauses and RCs
- (ii) Difference between *yes/no*-questions and *wh*-questions

Current study: Crossed factorial design

Figure 1. Linearly additive effect



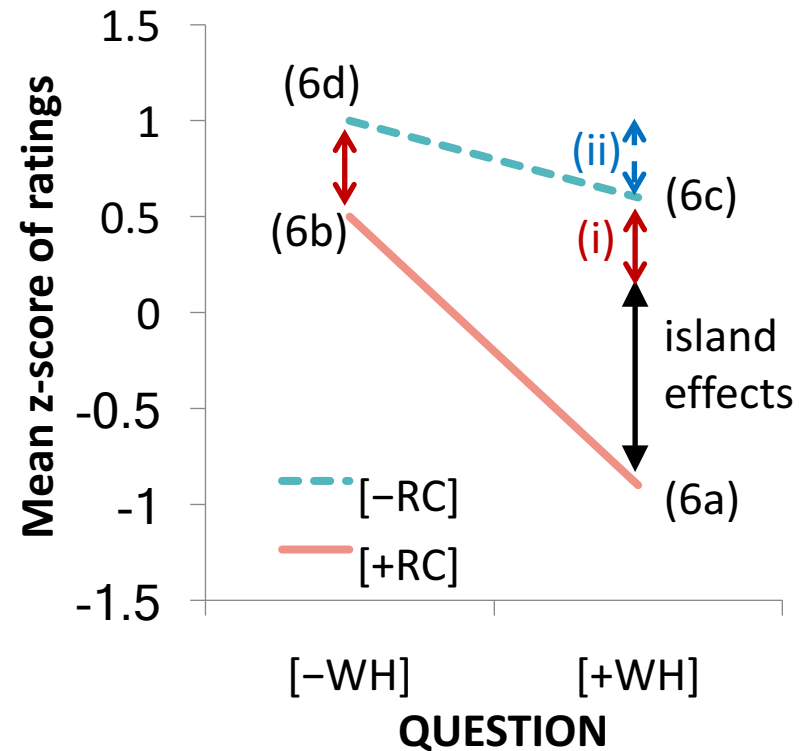
- No EMBEDDED × QUESTION interaction
- Predicted for Natives and Advanced L2ers

- (i) Difference between complement *that*-clauses and RCs
- (ii) Difference between *yes/no*-questions and *wh*-questions

Current study: Crossed factorial design

- Significant EMBEDDED × QUESTION interaction
- Predicted for Intermediate L2ers

Figure 2. Superadditive effect



- (i) Difference between complement *that*-clauses and RCs
- (ii) Difference between *yes/no*-questions and *wh*-questions

Current study: Tasks

- Acceptability Judgment Task
(Sprouse et al., 2012)
- Language History Questionnaire
(Li, Sepanski, & Zhao, 2006)
- Independent proficiency measure (Cloze test)
(Marsden, 2004)

Current study: Participants

- 10 Native speakers of Japanese
- 20 L1-English L2ers of Japanese
 - 4 L2ers excluded

Table 1. Participant Information

	Natives (<i>n</i> = 10)			L2ers (<i>n</i> = 16)					
	Range	M	SD	Intermediate (<i>n</i> = 11)			Advanced (<i>n</i> = 5)		
	Range	M	SD	Range	M	SD	Range	M	SD
Age of Testing	19–30	21	3.21	19–37	28	5.87	26–32	29	2.19
Age of L2 onset	—	—	—	4–21*	15	4.34	10–17	14	2.88
Years in Japan	—	—	—	0–9	4	3.11	1–5	3	1.73
Cloze test score (max = 42)	18–34	25	4.43	1–11	6	3.21	12–22	19	3.07

*Only 1 L2er before age 13. This L2er patterned like others in the group.

Current study: Materials

- Experimental items ($k = 40$)
 - Latin-squared to 4 lists
 - RCs: all subject RCs
 - RCs: all in matrix object position
 - *Wh*-phrases: half animate (*dare* 'who'), half inanimate (*nani* 'what')
- Fillers ($k = 40$)
 - Grammatical ($k = 20$)
 - Ungrammatical ($k = 20$)

Current study: Experimental items

(6) a. **Critical:** [+RC, +WH] ($k = 10$)

Taro-wa [[___ nani-o katta] onnanoko]-o mimashita ka?
Taro-TOP [[___ what-ACC bought] girl]-ACC saw Q
'What did Taro see [the girl [that ___ bought <what>]]?'

b. **Control 1:** [+RC, -WH] ($k = 10$)

Taro-wa [[___ ringo-o katta] onnanoko]-o mimashita ka?
Taro-TOP [[___ apple-ACC bought] girl]-ACC saw Q
'Did Taro see [the girl [that ___ bought an apple]]?'

c. **Control 2:** [-RC, +WH] ($k = 10$)

Taro-wa [Hanako-ga nani-o katta]-to iimashita ka?
Taro-TOP [Hanako-NOM what-ACC bought]-COMP said Q
'What did Taro say [that Hanako bought <what>]?'

d. **Control 3:** [-RC, -WH] ($k = 10$)

Taro-wa [Hanako-ga ringo-o katta]-to iimashita ka?
Taro-TOP [Hanako-NOM apple-ACC bought]-COMP said Q
'Did Taro say [that Hanako bought an apple]?'

Current study: Fillers

(7) a. **Matrix *wh*-question with an RC (grammatical)** ($k = 10$)

Dare-ga [[___ ringo-o katta] onnanoko]-o mimashita ka?
who-NOM [[___ apple-ACC bought] girl]-ACC saw Q
'Who saw [the girl [that ___ bought an apple]]?'

b. **Multiple *wh*-question with an RC (grammatical)** ($k = 10$)

Dare-ga [[___ **nani**-o katta] onnanoko]-o mimashita ka?
who-NOM [[___ what-ACC bought] girl]-ACC saw Q
'Who saw [the girl [that ___ bought what]]?'

c. **Theta-criterion violation (ungrammatical)** ($k = 10$)

* **Nani**-o Taro-wa ringo-o kaimashita ka?
what-ACC Taro-TOP apple-ACC bought Q
'What did Taro buy an apple?'

d. **RC-internal *naze* 'why' *in-situ* question (ungrammatical)** ($k = 10$)

* Taro-wa [[___ ringo-o **naze** katta] onnanoko]-o mimashita ka?
Taro-TOP [[___ apple-ACC why bought] girl]-ACC saw Q
'Why did Taro see [the girl [that ___ bought an apple <why>]]?'

Current study: Procedure

- Acceptability Judgment Task
 - 4-point scale from 1 'very unnatural' to 4 'very natural'
 - Off-scale 'I don't know' option
 - Lists assigned randomly
 - Items presented in random order
 - Acceptance ratings converted into z-scores (Sprouse et al., 2012)

Current study: Results

Table 2. Means and standard deviations of z-score ratings

	Natives ($n = 10$)		L2ers ($n = 16$)			
			Intermediate ($n = 11$)	Advanced ($n = 5$)		
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Critical [+RC, +WH]	0.16	(0.76)	-0.35	(0.80)	-0.74	(0.52)
Control 1 [+RC, -WH]	0.74	(0.62)	0.75	(0.71)	1.01	(0.40)
Control 2 [-RC, +WH]	0.70	(0.57)	0.58	(0.88)	0.64	(0.68)
Control 3 [-RC, -WH]	0.62	(0.57)	0.74	(0.80)	0.93	(0.60)

Current study: Results

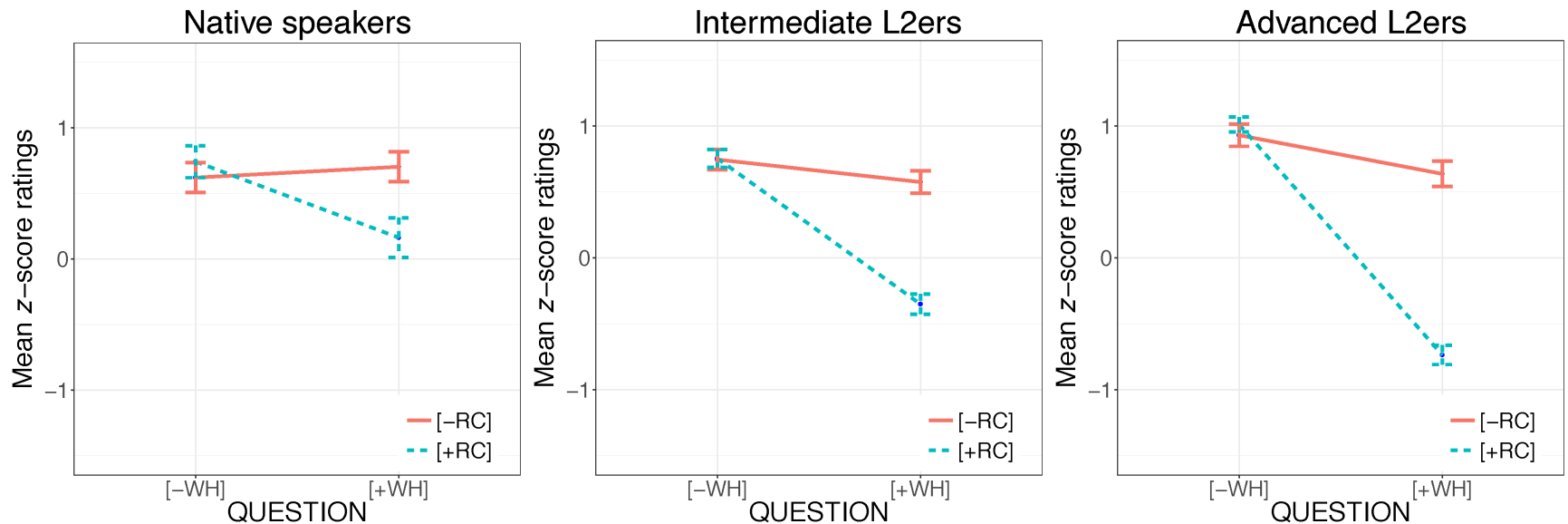
- Linear mixed-effect model
 - Fixed effects: EMBEDDED, QUESTION
 - Random effects: participants, items

Table 3. Significance level (p -value) of main effects and interaction

	Natives ($n = 10$)	L2ers ($n = 16$)	
		Intermediate ($n = 11$)	Advanced ($n = 5$)
EMBEDDED	.0723	.0142	.0005
QUESTION	.0924	<.0001	.0004
EMBEDDED × QUESTION	.0151	<.0001	<.0001

Current study: Results

Figure 3. Interaction plot by group (error bars represent 95% confidence interval)



- Significant EMBEDDED × QUESTION interaction in all groups
- Native results contradict previous work on Japanese

Discussion

- Why did the native speakers exhibit the superadditive effect?
 - RC island effect in Japanese?
 - Something else???

Comparison of critical items to *naze-in-situ* RCs

(6) a. **Critical: [+RC, +WH]**

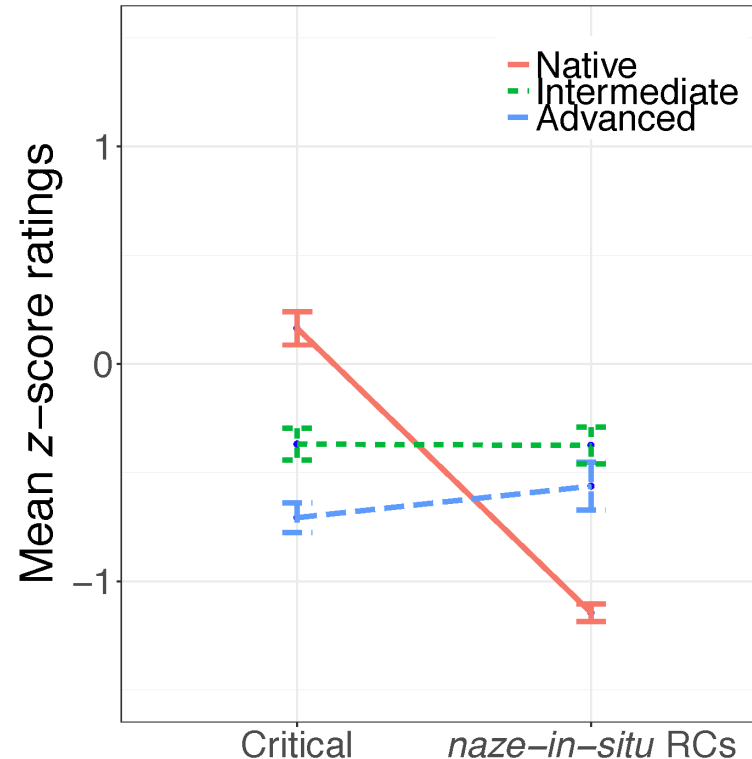
Taro-wa [[__ **nani**-o katta] onnanoko]-o mimashita ka?
Taro-TOP [[what-ACC bought] girl]-ACC saw Q
'What did Taro see [the girl [that __ bought <what>]]?'

(7) d. **RC-internal *naze* 'why' *in-situ* question (ungrammatical)**

*Taro-wa [[__ ringo-o **naze** katta] onnanoko]-o mimashita ka?
Taro-TOP [[apple-ACC why bought] girl]-ACC saw Q
'Why did Taro see [the girl [that __ bought an apple <why>]]?'

Comparison of critical items to *naze-in-situ* RCs

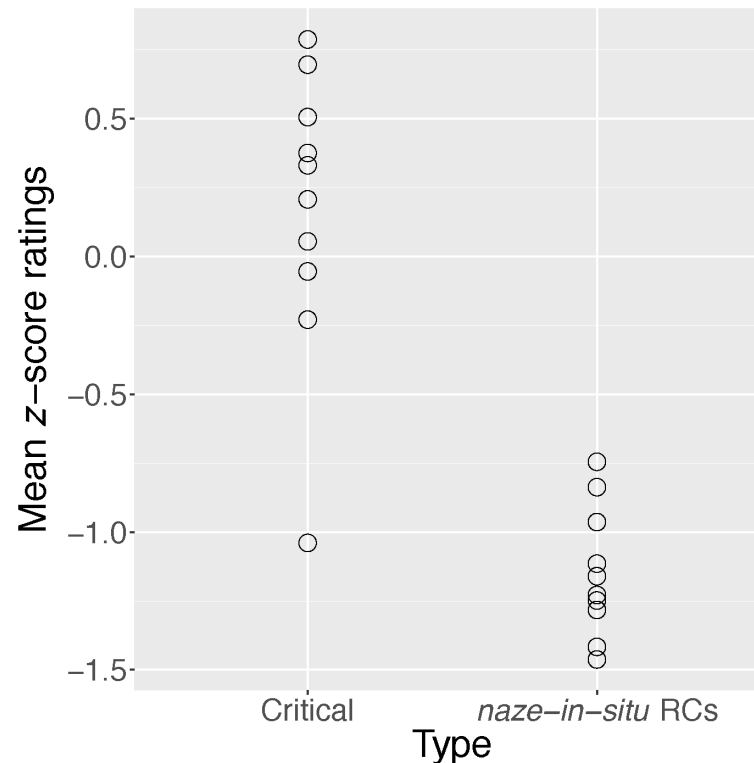
Figure 4. Comparison of critical items and *naze-in-situ* RCs



- Natives: Critical items rated **significantly higher** than *naze* ‘why’ *in-situ* RCs
- L2ers: **No significant difference** between the two

Virtually no variation in the NSs' ratings of critical items vs. *naze-in-situ* RCs

Figure 5. Each Native's mean z-score ratings on critical items and *naze-in-situ* RCs



Interim summary

- Superadditive effects in all groups
- Natives rated critical items significantly higher than *naze* 'why' *in-situ* RCs
- L2ers rated the two types equally low

- Natives' results do not indicate a true RC island effect?
- L2ers' results point to transferred (RC) island effects?

Future directions: Inclusion of factives

- Potential confound in the critical [+RC, +WH]
 - Island
 - Two dependencies: RC filler-gap dependency and dependency between *wh*-phrase and Q particle (Ishihara, 2002)
 - Critical: [+RC, +WH] → 2 dependencies
 - Control 1: [+RC, -WH] → 1 dependency
 - Control 2: [-RC, +WH] → 1 dependency
 - Control 3: [-RC, -WH] → 0 dependency
- Is the superadditive effect due to the cost of resolving a second dependency?
- A *wh*-question inside factives has only one dependency

Future directions: Inclusion of factives

- RCs and factives: Is the superadditive effect due to the cost of resolving a second dependency?

(8) a. **RC, *wh*-question** (island, 2 dependencies)

Taro-wa [[— **nani**-o katta] onnanoko]-o mimashita ka?
 Taro-TOP [[— what-ACC bought] girl]-ACC saw Q
 ‘What did Taro see [the girl [that __ bought <what>]]?’

b. **RC, *yes/no*-question** (island, 1 dependency)

Taro-wa [[— ringo-o katta] onnanoko]-o mimashita ka?
 Taro-TOP [[— apple-ACC bought] girl]-ACC saw Q
 ‘Did Taro see [the girl [that __ bought an apple]]?’

c. **Factive, *wh*-question** (island, 1 dependency)

Taro-wa [[onnanoko-ga **nani**-o katta] koto]-o kikimashita ka?
 Taro-TOP [[girl-NOM what-ACC bought] fact]-ACC heard Q
 ‘What did Taro hear the fact [that [the girl __ bought <what>]]?’

d. **Factive, *yes/no*-question** (island, 0 dependency)

Taro-wa [[onnanoko-ga ringo-o katta] koto]-o kikimashita ka?
 Taro-TOP [[girl-NOM apple-ACC bought] fact]-ACC heard Q
 ‘Did Taro hear the fact [that [the girl __ bought an apple]]?’

Future directions: Inclusion of factives

- Factives and complement *that*-clauses: Is the superadditive effect due to an island effect?

(9) a. **Factive, *wh*-question** (island, 1 dependency)

Taro-wa [[onnanoko-ga nani-o katta] koto]-o kikimashita ka?
 Taro-TOP [[girl-NOM what-ACC bought] fact]-ACC heard Q
 ‘What did Taro hear the fact [that [the girl __ bought <what>]]?’

b. **Factive, *yes/no*-question** (island, 0 dependency)

Taro-wa [[onnanoko-ga ringo-o katta] koto]-o kikimashita ka?
 Taro-TOP [[girl-NOM apple-ACC bought] fact]-ACC heard Q
 ‘Did Taro hear the fact [that [the girl __ bought an apple]]?’

c. **Complement *that*-clause, *wh*-question** (non-island, 1 dependency)

Taro-wa [onnanoko-ga nani-o katta]-to kikimashita ka?
 Taro-TOP [girl-NOM what-ACC bought]-c heard Q
 ‘What did Taro hear that [the girl bought <what>]?’

d. **Complement *that*-clause, *yes/no*-question** (island, 0 dependency)

Taro-wa [onnanoko-ga ringo-o katta]-to kikimashita ka?
 Taro-TOP [girl-NOM apple-ACC bought]-c heard Q
 ‘Did Taro hear that [the girl bought an apple]?’

Future directions: L2ers with *wh-in-situ* L1

- Comparison between L2ers with *wh-in-situ* L1 (e.g., Korean) and L2ers with *wh*-movement L1 (e.g., English), holding Japanese proficiency constant
- Predictions for L1-Korean L2ers of Japanese:
 - Behave like Japanese native speakers from the start
 - Initially differ significantly from L1-English L2ers of Japanese (up until L1-English L2ers converge on the target Japanese grammar)

Conclusion

- Superadditive effects in Intermediate L2ers, Advanced L2ers, and Natives
- Natives rated critical items significantly higher than *naze* 'why' *in-situ* RCs
- L2ers rated the two types equally low
 - Natives: Not a true RC island effect?
 - L2ers: Transferred (RC) island effects?
- Future directions:
 - More investigation into the superadditive effect of native Japanese speakers (e.g., inclusion of factives)
 - Inclusion of L2ers with a *wh-in-situ* L1 (e.g., Korean)

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