L2 comprehension of English relative clauses: Resumption mitigates processing strain

Handout:

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GASLA-17

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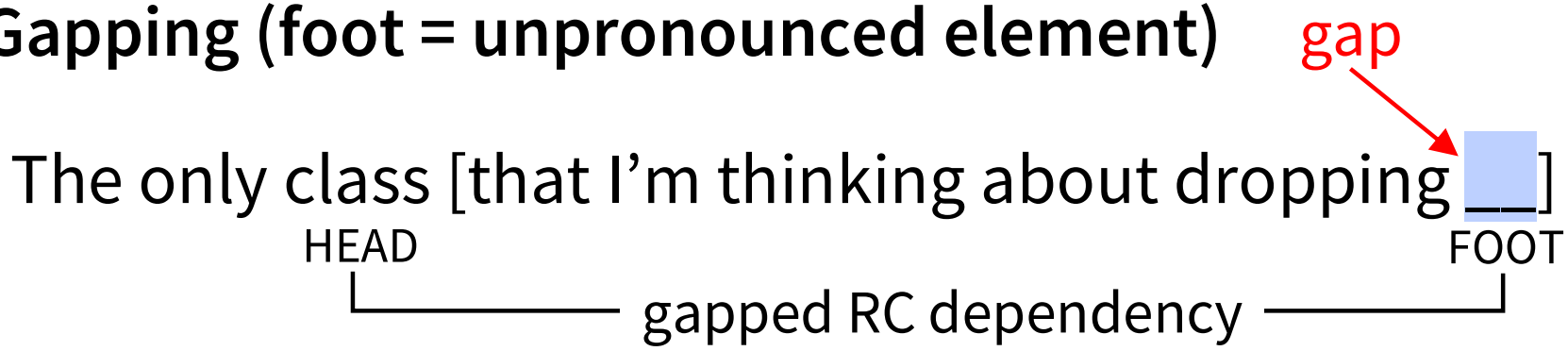
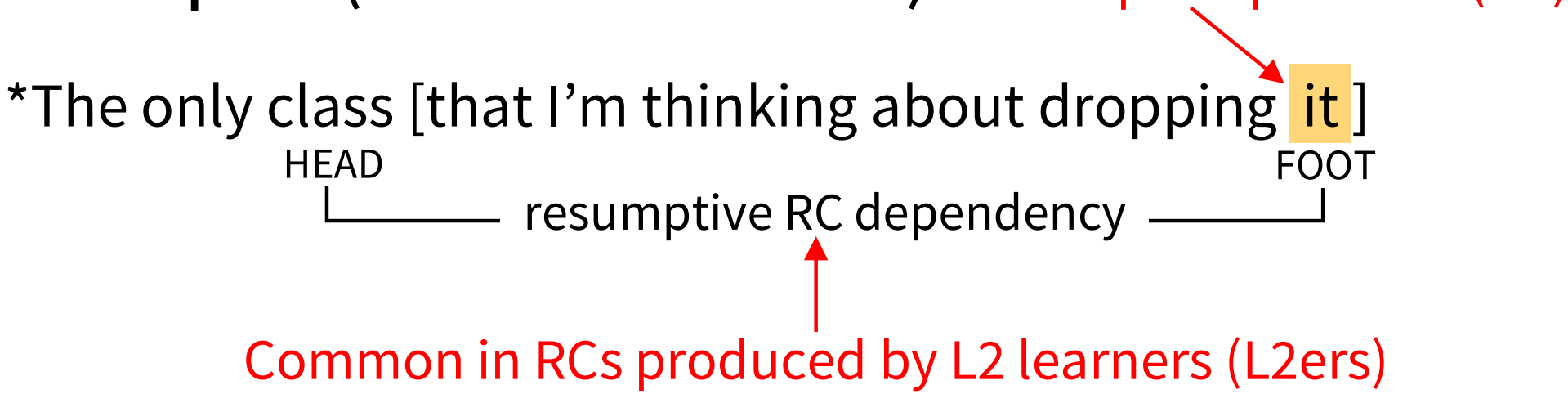
Gapping vs. resumption in relative clauses (RCs)

Gapping (foot = unpronounced element)



Resumption (foot = overt nominal)



Grammatical Resumptives vs. Processing Resumptives

Grammatical resumptives

- Licensed by the grammar
- Arabic, Cantonese, Hebrew, Irish, Mandarin, Persian, etc.

Processing resumptives

- Not licensed by the grammar
- Decreases processing load in difficult RC dependencies
- English, French, Italian, Korean, Spanish

(see Asudeh, 2004; McCloskey, 2017; Meltzer-Asscher, 2021; Sells, 1984)

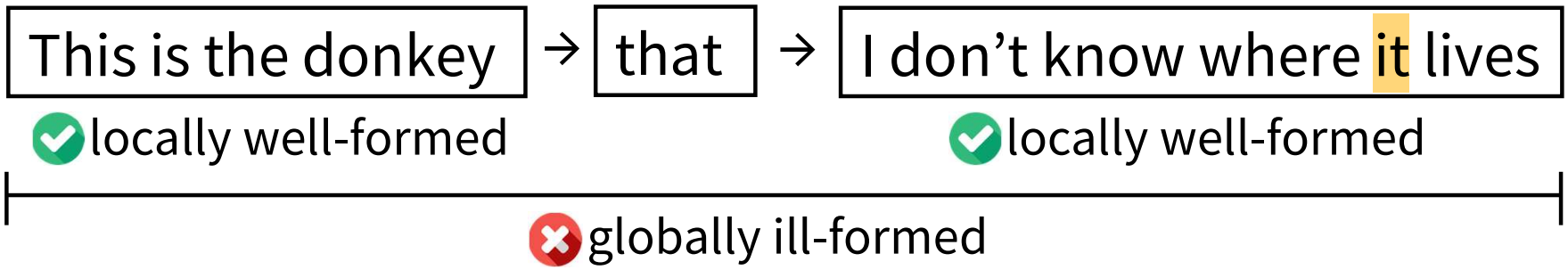
Resumption facilitates processing by…

- offering a means of establishing coreference when a gapped RC dependency breaks down

(Asudeh, 2004, 2012; see also Morgan & Wagers, 2018)

- ensuring local well-formedness, even if they cannot repair the global well-formedness of the sentence

(Asudeh, 2004, 2012; see also Morgan & Wagers, 2018)



(adapted from Asudeh, 2004, p. 315, (8.32))

Distribution of Gapped and Resumptive RCs

direct object RCs (SRCs)

Table 1. Distribution of grammatical gapping (−), resumption (+), and unrelativizable positions (0) in single-clause RCs

Language	SU	DO	IO	OBL	GEN	OCOMP
English	−	−	−	−	−	−
Korean	−	−	−	−	+	0
Mandarin	−	±	+	+	+	+

SU = subject; DO = direct object; IO = indirect object; OBL = oblique; GEN = genitive; OCOMP = object of comparison; adapted from Keenan & Comrie, 1977, p. 93, Table 2

Ongoing debate about the distribution of resumptive RCs in Korean (see Han, 2013; Kwon, 2008; Song, 2003) and Mandarin (see Hitz & Francis, 2016; Pan, 2016)

Experimental research on adult L2 resumption

- L2ers produce resumptive RCs even when ungrammatical in both the L1 and the target language

(e.g., Gass, 1979; Hyltenstam, 1984; Pavesi, 1986)

- Production rates for resumptive RCs are higher in environments thought to be harder for relativization

(e.g., Algady, 2013; Gass, 1979; Hyltenstam, 1984; Maghrabi, 1997)

Taken as evidence that…

- Participants' interlanguages permit resumptive RCs

(e.g., Algady, 2013; Eckman, 2004; Gass, 1979; Hyltenstam, 1984; Pavesi, 1984)

⚠ Assumes that performance patterns reflect representations licensed by the grammar

- Resumption facilitates L2 processing of RCs

(e.g., Algady, 2013; Eckman, 2004; Hyltenstam, 1984; Maghrabi, 1997)

⚠ Has not been tested for real-time comprehension

Experimental research on adult L1 English resumption

- **Acceptability Judgment Tasks:**
  Ratings for RPs low across conditions, suggesting that resumption is not a licit option for relativization

  (e.g., Han et al., 2012; Heestand et al., 2011; Keffala & Goodall, 2011)

- **Self-Paced Reading Tasks:**
  Reading times (RTs) following RPs faster than those following gaps under processing strain, suggesting that resumption may facilitate real-time RC comprehension

  (e.g., Hammerly, 2022; Hofmeister & Norcliffe, 2013)

⚠ Faster RTs can also indicate abandonment of the parse, so it is important to test RC interpretation (Morgan et al., 2020)

⚠ Almost no studies have done this, and those that have did not show that RPs assist with accurate RC interpretation (Hammerly, 2022; Morgan et al., 2020)

Syntactic Environments and Processing Difficulty

- **SU > DO > IO > OBL > GEN > OCOMP**

(Keenan & Comrie, 1977)

- **Short-Distance > Long-Distance > *Wh*-Island**
  - **Short-Distance:**
    the man [that these detectives arrested ___]
  - **Long-Distance:**
    the man [that I think [these detectives arrested ___]]
  - ***Wh*-island:**
    *the man [that I wonder [which detectives arrested ___]]

(Hawkins, 1999, 2004; Morgan & Wagers, 2018; O'Grady, 2012, 2022)

Table 3. Expected distribution of gapping (−) and resumption (+) and unrelativizable positions (0) in the relevant ORC environments

Language	Short-Distance	Long-Distance	'*Wh*-Island'
English	−	−	0
Korean	−	−	−
Mandarin	±	±	±

Based on judgments of Korean and Mandarin language consultants; for English, see also Ross (1967); for Korean, see also Han (2013); for Mandarin, see also Pan (2016)

Including both L1-Korean and L1-Mandarin participants allows us to observe how having an L1 with vs. without grammatical resumption in the relevant environment affects performance

Scope of Project

2 Sub-Studies

- Direct Object RCs (ORCs)
- Subject RCs (SRCs)

4 Main Tasks (in the following order)

1. Elicited Production (English) → processing (production)
2. Self-Paced Reading (English) → processing (comprehension)
3. Acceptability Judgment (English & Korean/Mandarin) → acceptability
4. C-test (English) → proficiency

Testing L2ers in both the L1 and the TL is important because the exact distribution of RPs in Korean and Mandarin is still not well understood (see Zenker & Schwartz, 2017)

Research Questions (RQs)

For adult L1-English controls and L1-Korean and L1-Mandarin adult L2ers of English…

RQ1: Do RPs facilitate real-time comprehension of English ORCs?

→ Extends previous L2 research by probing comprehension and looking at a different processing hierarchy

→ Contributes to L1 research by directly testing for accurate RC interpretation

RQ2: If so, does this hold for individuals who do not consistently accept RPs?

→ Tests the traditional L2 assumption that performance patterns reflect representations licensed by the grammar

RQ3: Does L2 English proficiency affect ratings for RPs?

→ Investigates whether L2ers can become sensitive to English's prohibition on resumption in RCs

Participants

 Adult English native speakers (ENSs)

 Adult L1-Korean L2ers of English (KLEs)

 Adult L1-Mandarin L2ers of English (MLEs)

Table 4. Participant information (means and ranges)

Group	*n*	Age at Testing	C-test Score	Age of Onset	Years in Anglosphere
ENS	90	26.98 (18–71)	42.79 (22–50)	—	—
KLE	69	26.29 (18–41)	32.64 (7–46)	9.35 (8–15)	0.32 (0–7)
MLE	76	28.14 (18–45)	28.83 (7–49)	9.71 (8–14)	0.04 (0–1)

50-item C-test (Zenker, in prep.) used to measure English proficiency

Self-Paced Reading Task (SPRT)

Probed the processing of gaps vs. RPs during real-time ORC comprehension

Experimental design

- 2 × 3 design crossing DEPENDENCY (gap vs. RP) and ENVIRONMENT (short-distance vs. long-distance vs. *wh*-island)
- 30 critical items (6 conditions × 5 tokens, Latin-squared) and 42 fillers (28 grammatical; 14 ungrammatical)

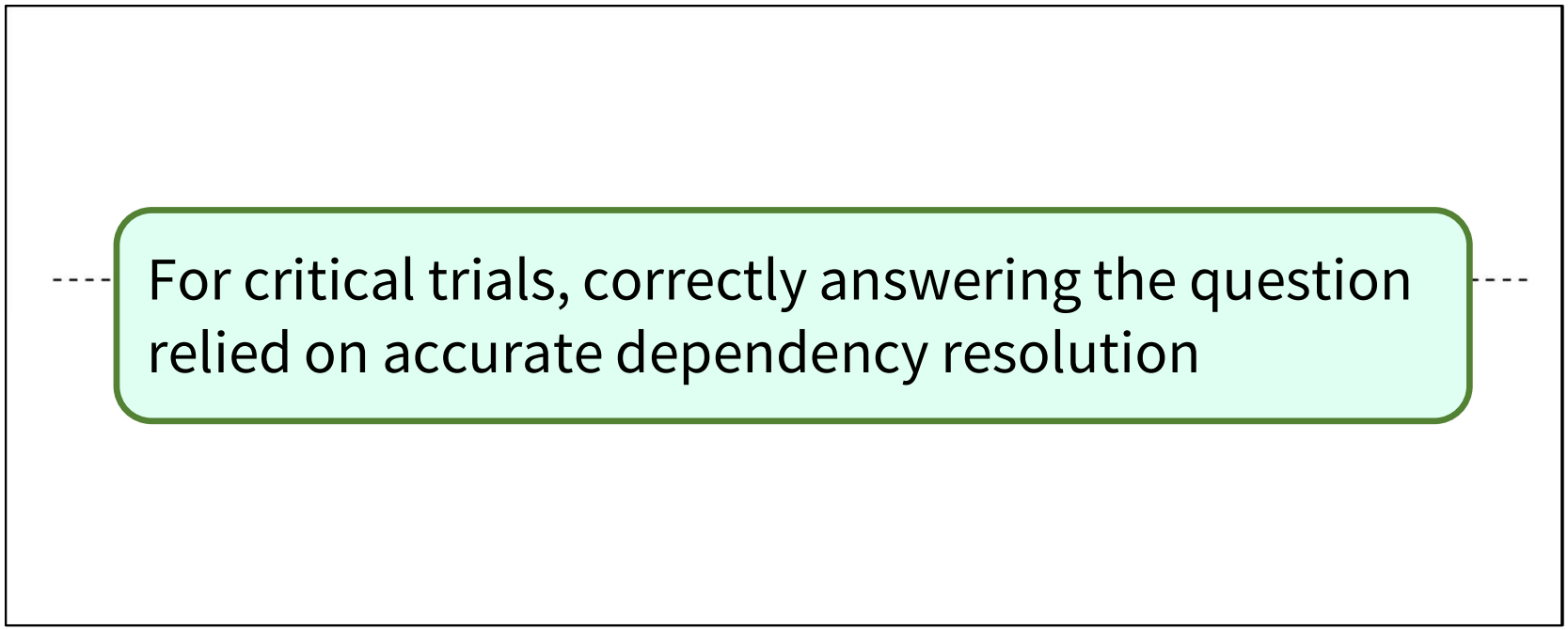


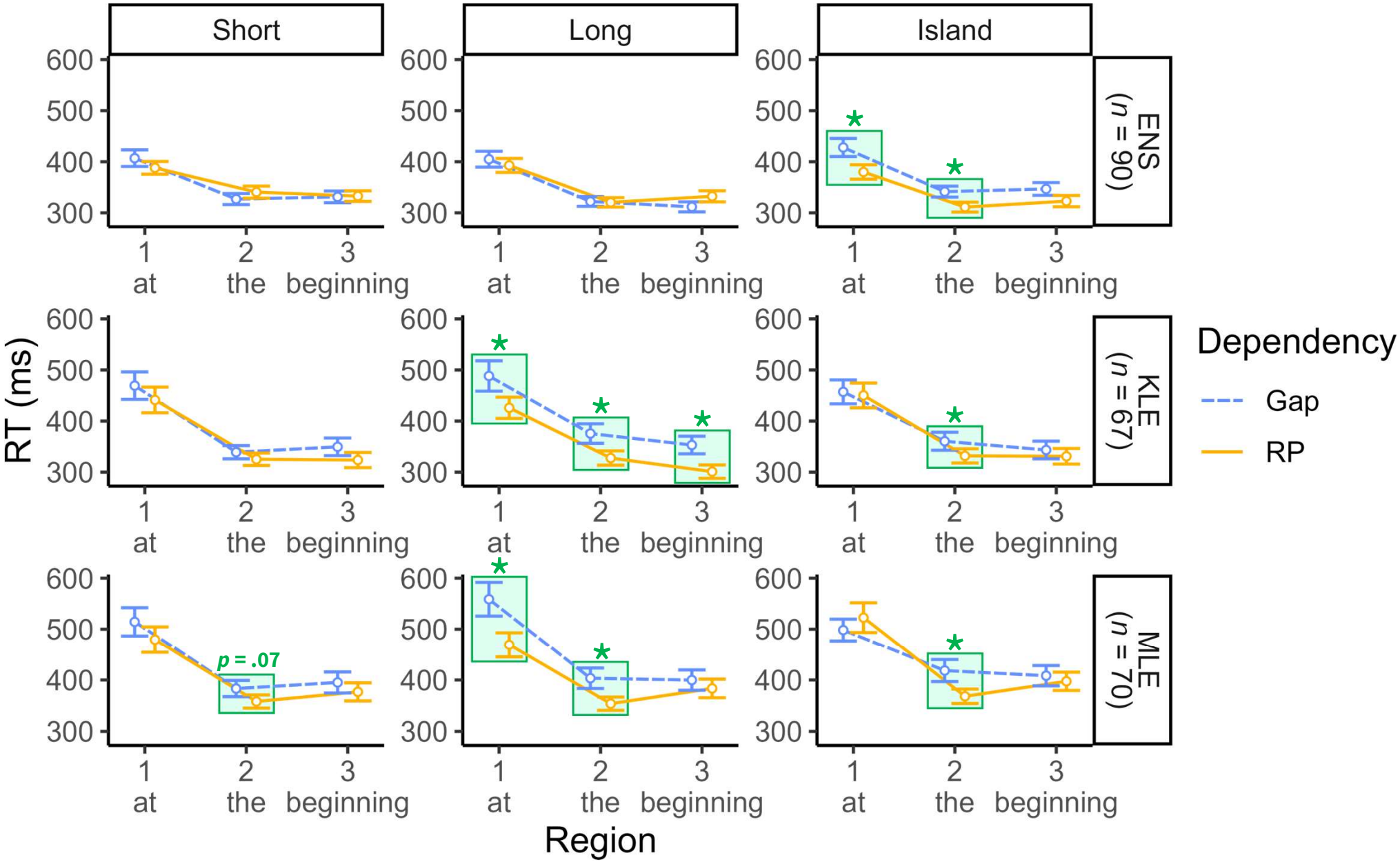
Table 3. Critical Conditions in the Self-Paced Reading Task

Environment	Example Stimulus
Short	I think Mary knows the man that these detectives arrested {___/*him} ***at the beginning*** of the week.
Long	Mary knows the man that I think these detectives arrested {___/*him} ***at the beginning*** of the week.
Island	Mary knows the man that I wonder which detectives arrested {*___/*him} ***at the beginning*** of the week.

(cf. Hammerly, 2022; Hofmeister & Norcliffe, 2013)

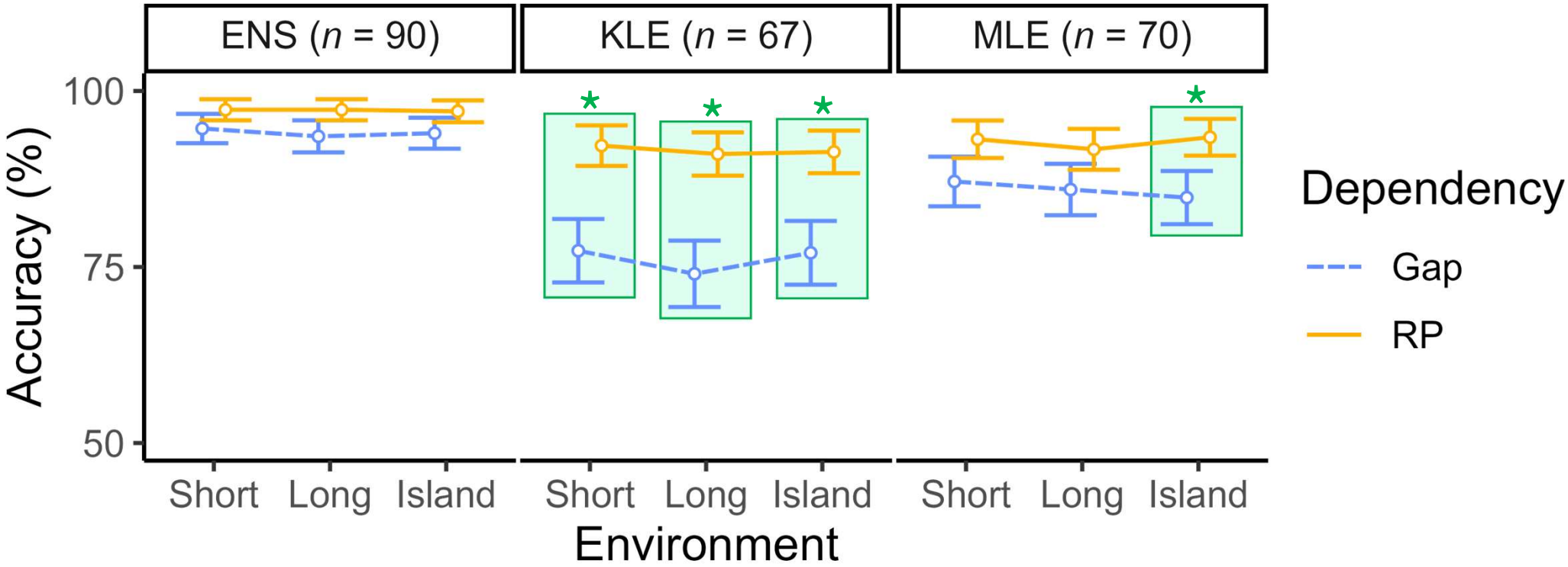
Regions of interest

Fig 1. Mean RTs in the SPRT



Note. Error bars are 95% *CI*s; Region 1 model formula: Log RT ~ Dependency * Environment * Group + (1 + Dependency + Environment | Participant) + (1 + Dependency + Environment + Group | Item)

Fig 2. Comprehension-question accuracy in the SPRT



Note. Error bars are 95% *CI*s; model formula: Accuracy ~ Dependency * Environment * Group + (1 + Dependency + Environment | Participant) + (1 + Dependency + Environment + Group | Item)

Acceptability Judgment Task (AJT)

Tested the offline acceptability of gaps vs. RPs in ORCs

Experimental design

- Same design as self-paced reading task
- 30 critical items (6 conditions × 5 tokens, Latin-squared) and 42 fillers (28 grammatical; 14 ungrammatical)
- English, Korean, and Mandarin versions

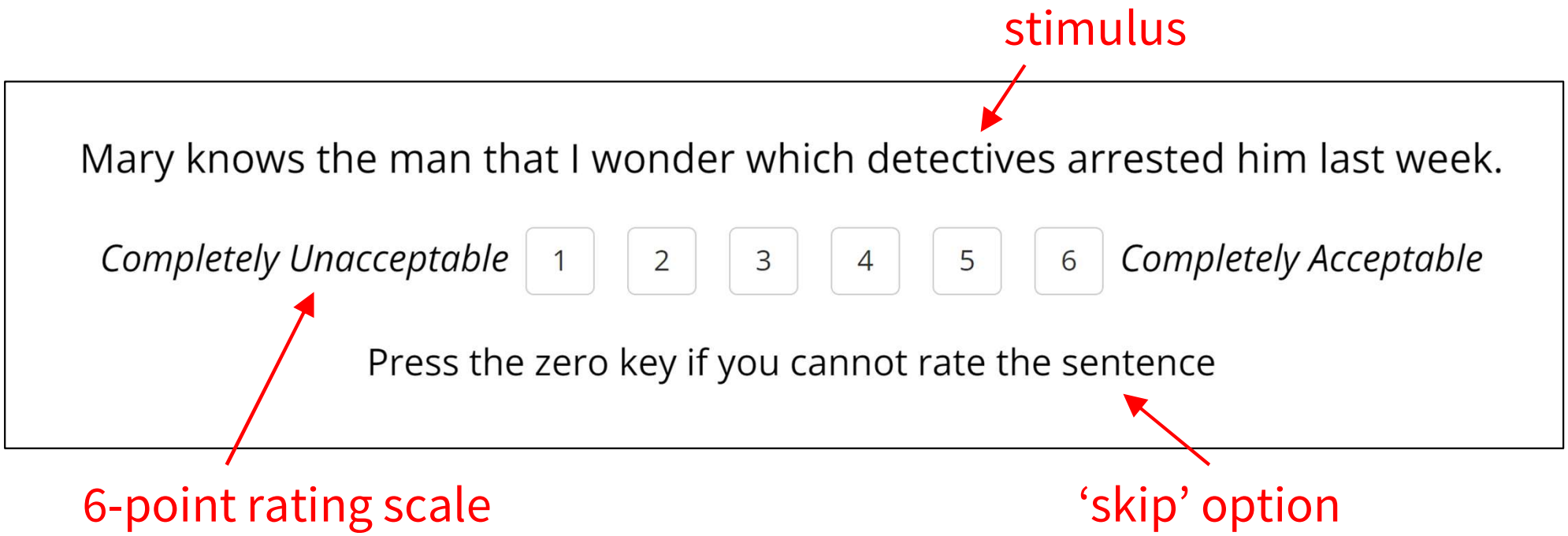


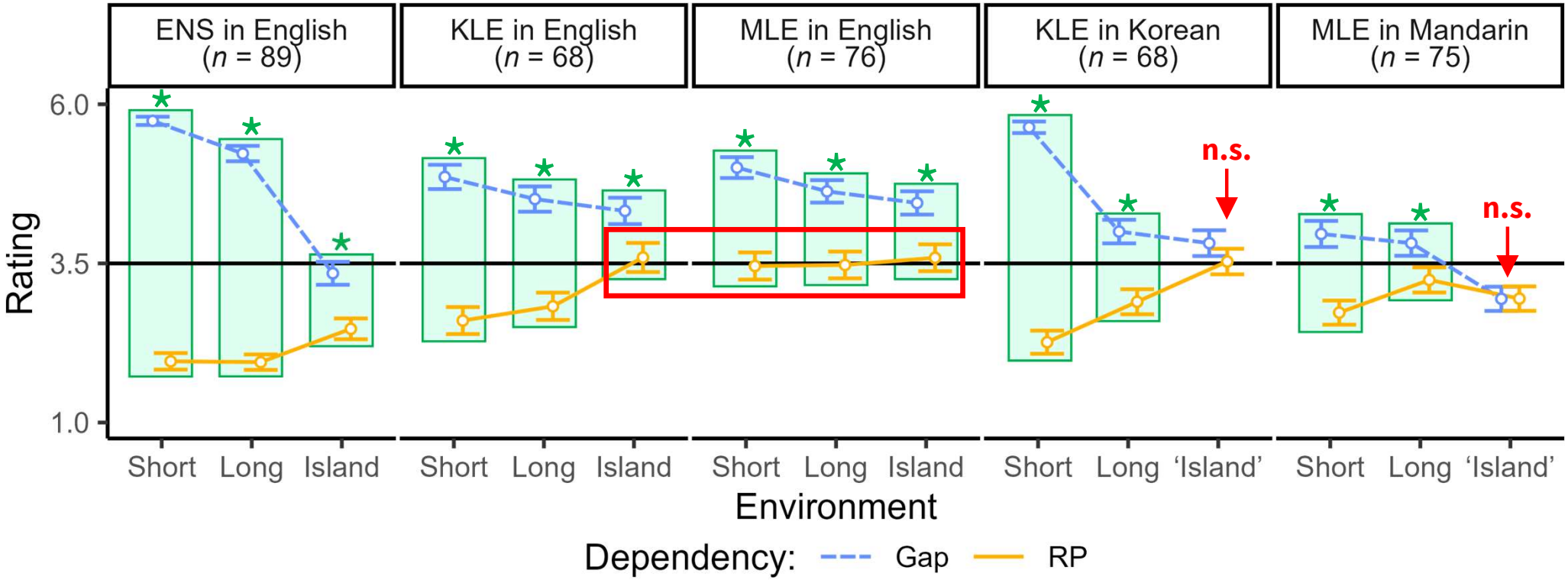
Table 4. Critical Conditions in the English Acceptability Judgment Task

Environment	Example Stimulus
Short	I think Mary knows the man that these detectives arrested {___/*him} last week. ← Shortened time phrase
Long	Mary knows the man that I think these detectives arrested {___/*him} last week.
Island	Mary knows the man that I wonder which detectives arrested {*___/*him} last week.

Korean and Mandarin AJTs:

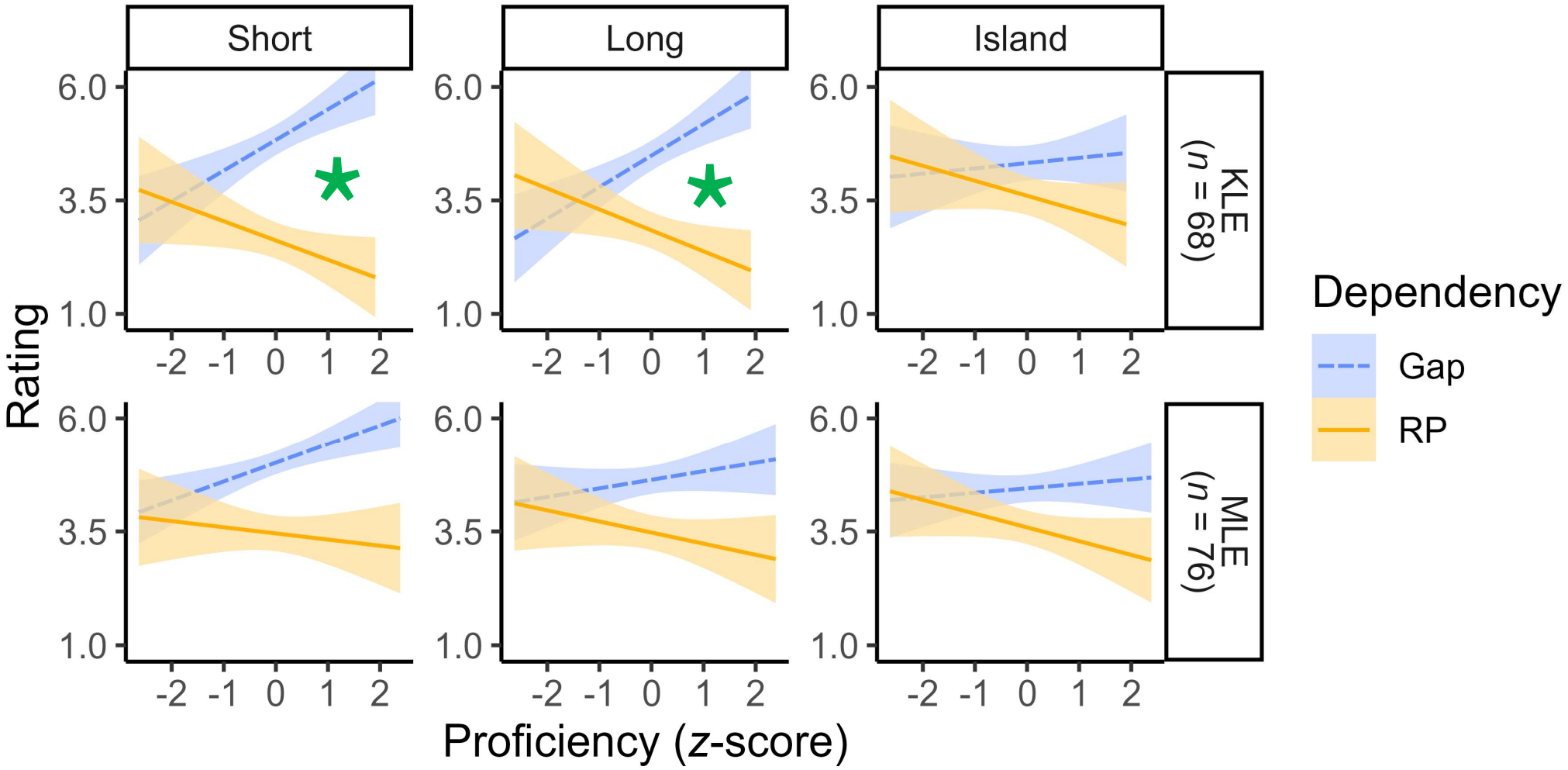
- Closely-translated versions of the English stimuli
- 'Island' conditions not assumed to be syntactic islands

Fig 3. Mean ratings by group in the AJTs



Note. Error bars are 95% *CI*s. Center line represents midpoint on rating scale; model formula: Rating ~ Dependency * Environment * Group + (1 + Dependency + Environment | Group) + (1 + Dependency + Environment + Group | Item)

Fig 4. Accuracy data with RP acceptors removed



Note. Error bars are 95% *CI*s; model formula: Accuracy ~ Dependency * Environment * Group + (1 + Dependency + Environment | Participant) + (1 + Dependency + Environment + Group | Item)

Reanalysis of the SPRT data

Remove consistent RP acceptors to test whether processing effects depend on RP acceptance

Identification of consistent RP acceptors

→ Participants who gave “acceptable” ratings (4, 5, or 6) to ≧ 80% of RP trials in at least one condition

Fig 5. Proportion of RP acceptors in the English AJT

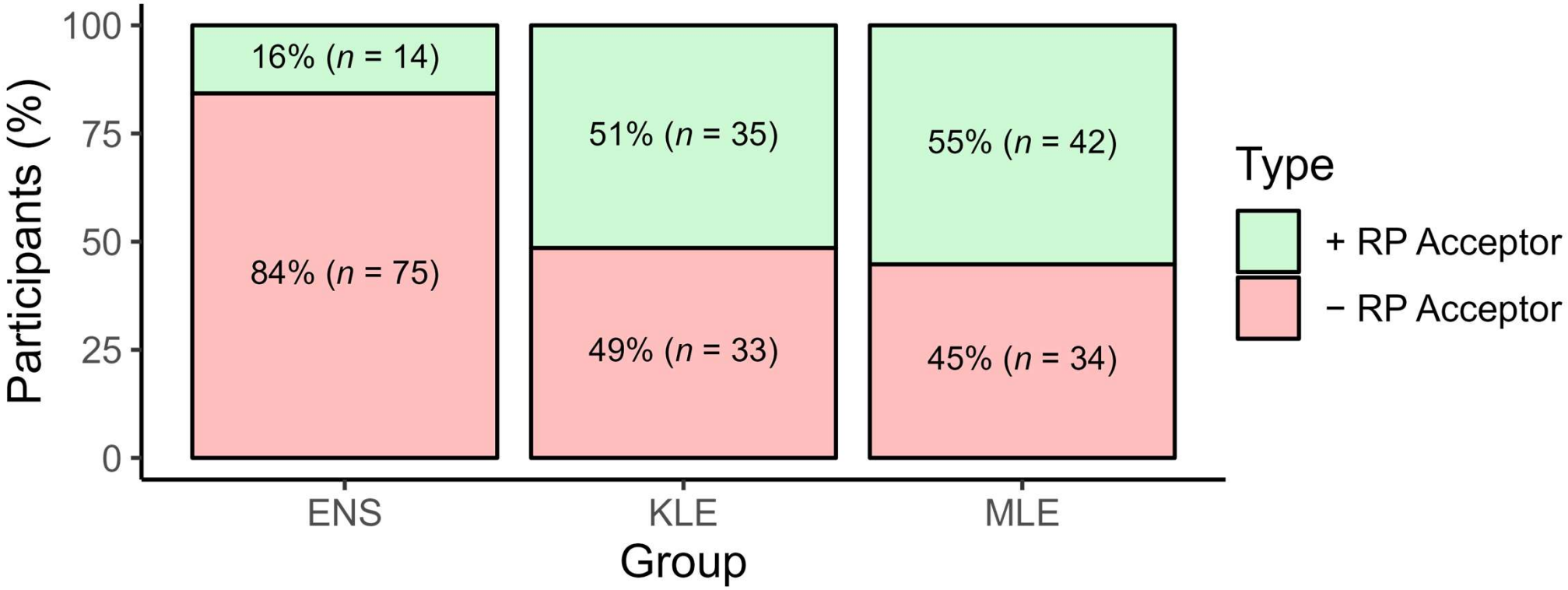
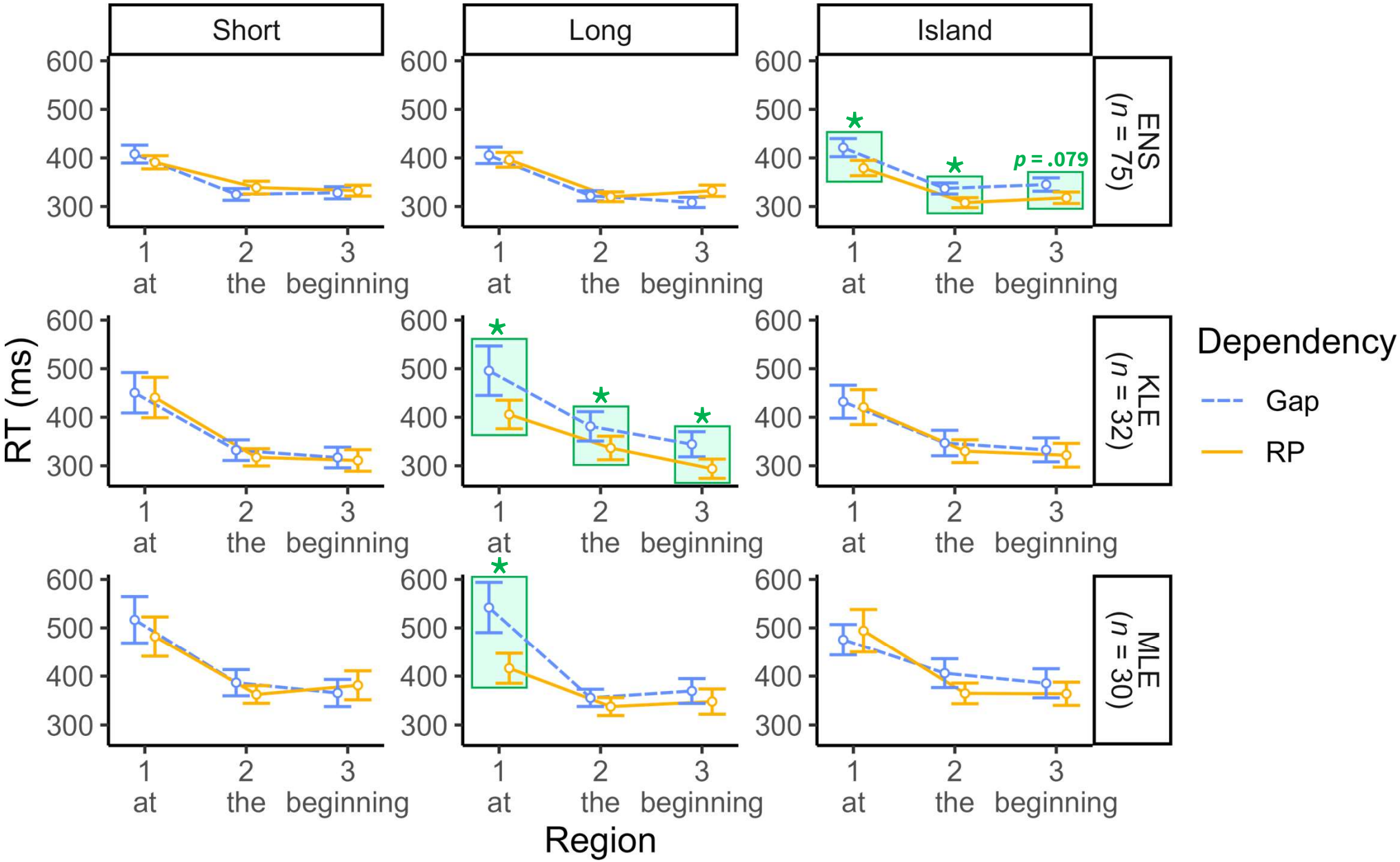
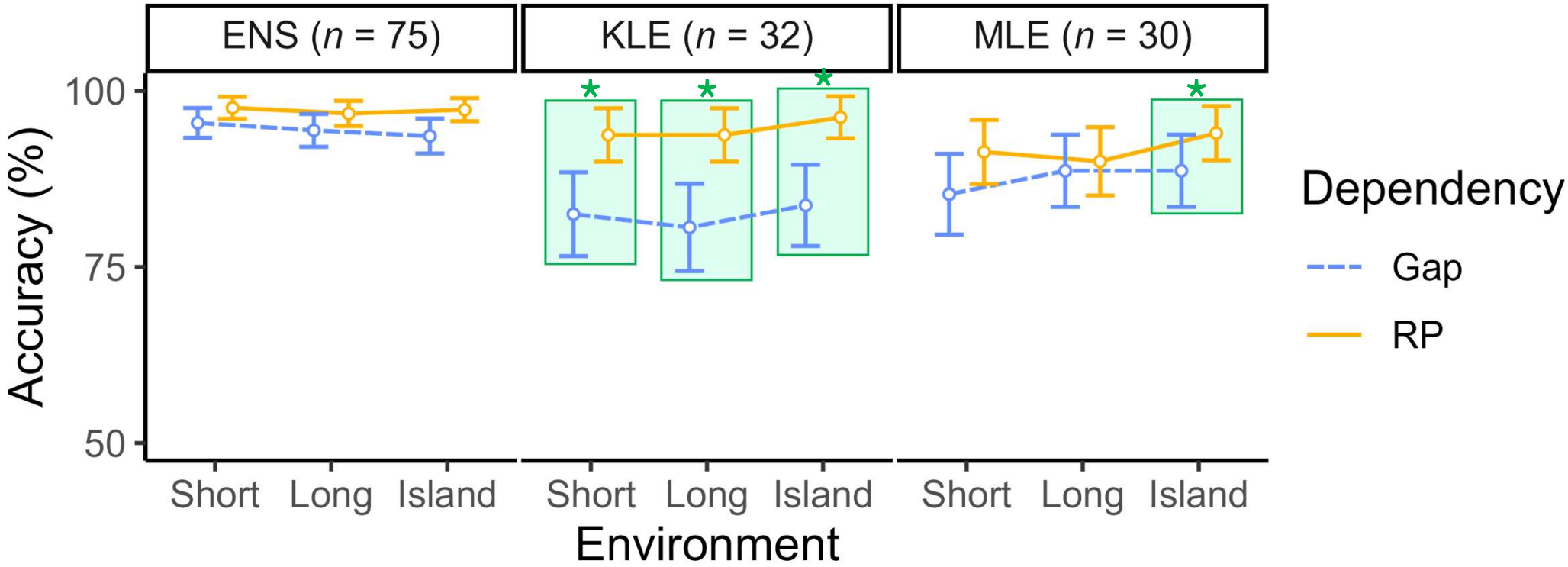


Fig 6. RT data with RP acceptors removed



Note. Error bars are 95% *CI*s; Region 1 model formula: Log RT ~ Dependency * Environment * Group + (1 + Dependency + Environment | Participant) + (1 + Dependency + Group | Item)

Fig 7. Accuracy data with RP acceptors removed



Note. Error bars are 95% *CIs*; Model formula: Accuracy ~ Dependency * Environment * Group + (1 + Dependency + Environment | Participant) + (1 + Dependency + Environment + Group | Item)

Discussion

RQ1: Do RPs facilitate real-time comprehension of English ORCs?

Yes, analysis of the RTs and comprehension-question accuracy scores indicated that RPs assist with ORC comprehension under processing strain

→ Challenges claims that resumption only helps with production (e.g., Ferreira & Swets, 2005; Morgan et al., 2020)

RQ2: If so, does this hold for individuals who do not consistently accept RPs?

- Yes, the same general pattern of results was observed in the SPRT data even with RP acceptors removed

→ Suggests that for ENSs and many L2ers, resumptive ORCs are purely processing resumptives

→ Challenges the traditional L2 assumption that performance reflects representations licensed by the grammar (e.g., Hyltenstam, 1984; Eckman, 2004)

RQ3: Does L2 English proficiency affect ratings for RPs?

- Yes, higher proficiency scores were associated with lower ratings for RPs and higher ratings for gaps

  → Indicates that L2ers can become sensitive to English's prohibition on resumption in RCs

  → This sensitivity appears to appears to develop fastest where processing is easiest

Future Directions

RP too close to head noun?

- Why didn't MLEs consistently accept RPs in Mandarin?

Mandarin Stimulus in 'Island' Environment

黃	麗	認識	那	個	我	好奇	哪	些	偵探
Huang	Li	renshi	na	ge	wo	haoqi	na	xie	zhentan
Huang	Li	know	DEM2	CL	1S	wonder	which	CL	detective
上	個	星期	逮捕	{__/他}	的	男人。			
shang	ge	xingqi	daibu	{__/ta}	de	nanren			
last	CL	week	arrest	{__/3MS}	REL	man			

'Huang Li knows the man that I wonder which detectives arrested *(*him) last week.'

- Do RPs facilitate RC processing in Korean and Mandarin?
- How does structural distance in L1 vs. target language RCs (head position, etc.) contribute to performance?

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