

Anaphora resolution by Japanese learners of English: Constrained by syntax and semantics

Michael Mansbridge (JSPS, Nagoya University) & Katsuo Tamaoka (Nagoya University)
michaelp.mansbridge@gmail.com

Because Binding Principle A states that a reflexive anaphor (e.g., herself/himself) must be bound within its local binding domain (i.e., c-commanded), when inaccessible distractors intervene between a reflexive and its antecedent, they should be eliminated during anaphora resolution. L1 processing studies (e.g., Badecker & Straub, 2002; Cunnings & Felser, 2013; Sturt, 2003) have revealed mixed findings demonstrating that at the very least that potential inaccessible binders might interfere or cause a facilitatory intrusion effect during anaphora resolution with more pronounced effects occurring when the distractor is in a subject position (Patil et al., 2016). In comparison, L2 processing studies (e.g., Felser et al., 2009) have revealed that inaccessible binders can interfere during a retrieval process and have argued that L2 processing is guided more so by discourse and semantic constraints than syntactic ones (e.g., Clahsen & Felser, 2006). However, these L2 studies have not effectively addressed whether L2 learners are guided by syntactic cues during retrieval but instead revealed it was not guided by Principle A. As such, the current study investigated L2 processing to determine if both syntactic (i.e., +subject) and semantic (+gender) features are checked during anaphora resolution using relative clauses (RC).

32 Japanese learners of English in Japan were recruited. 32 sentences were designed in a 2(RC: ORC vs. SRC) x 2(Gender: Match vs. Mismatch) fashion to test for the interference/intrusion of the +subject +match(gender) for the inaccessible RC antecedent. Participants' working memory and English reading ability were measured using a Reading Span Task (Unsworth et al., 2005). For the task proper, participants undertook a Lexical Maze Task (see Fig 1) (Forster, 2010) where upon a successful completion of a series of lexical decisions, a sentence is formed. Reaction times (RT) were recorded at each word of the sentence, and only correctly formed sentences were analyzed. If L2 speakers are not constrained by syntactic features, then both the ORC and SRC with matching gender features should interfere during retrieval or cause a facilitatory intrusion effect (e.g., Cunnings & Felser, 2013). However, if they are guided by syntactic features during the retrieval process, then only the ORC should interfere or facilitate processing when the inaccessible antecedent matches the reflexive's gender.

SRC: The guard who startled the (match: butler) / (mismatch: maid) drove himself to the bank.

ORC: The guard who the (match: butler) / (mismatch: maid) startled drove himself to the bank.

Using linear mixed effects (Table 1), the results revealed that at the matrix verb (adjusted by significant predictors: trial, English reading ability, word length and frequency), significant differences were found between RC conditions, effectively showing increased RTs for ORCs. No effect of noun gender was found. At the reflexive (adjusted by significant predictors: trial, English reading ability, reading span accuracy, matrix verb RT), while no significant differences were found between the conditions of RC and noun gender, the interaction of the two was significant. Importantly, the ORC with matching genders was found to be the condition with the fastest RTs, while the others had similar increased RTs thus suggesting a facilitatory intrusion effect (Fig 2).

While ORCs were more difficult to process prior to the reflexive, ORCs with matching genders appeared to facilitate the reading of the reflexive. This demonstrates that the syntactic cue for +subject and the semantic cue +match(gender) were being satisfied by the ORC subject despite its inaccessible position. Though this result agrees with the findings of Felser et al. (2009) such that semantic cues can interfere/intrude during retrieval in despite of Principle A, the results add to it such that the more local (temporal/linear locality) SRC distractors did not cause an interference/intrusion effect due to the -subject feature of the distractor. In conclusion, L2 processing is guided by both syntactic and semantic features during an anaphor retrieval process.

References

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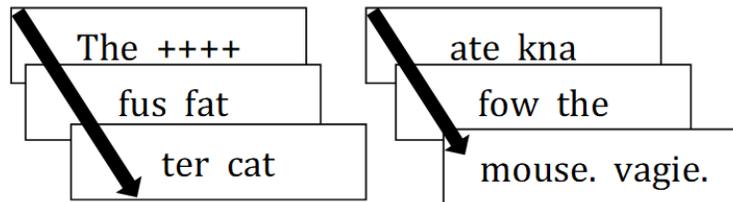


Figure 1. Procedure of the lexical maze task

Estimated Reaction Times at the Anaphor

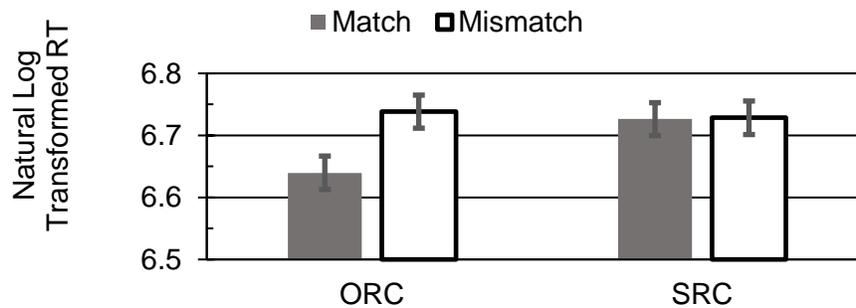


Figure 2. Estimated reaction times at the reflexive anaphor

Table 1. LME at the reflexive anaphor

	Estimate	SE	df	t value	p value	
RC	-0.00986	0.01822	703.9	-0.541	0.58862	
Gender	-0.0116	0.01849	693.3	-0.627	0.53058	
trial.z	-0.06042	0.00894	689.4	-6.756	3.02E-11	***
reading.z	0.08387	0.02206	31.7	3.803	0.00062	***
ACC.z	-0.04496	0.02185	29.1	-2.058	0.04866	*
lnVerb_RT.z	0.02247	0.0109	504.4	2.063	0.03965	*
RC:Gender	-0.07728	0.03596	684.9	-2.149	0.03198	*