

Attraction effect in the processing of number agreement in English as a second language

Introduction & Research Question

- Agreement attraction effect**
 - Tendency for the verb to erroneously agree with the local noun phrases that precede it much immediately than the head noun (Bock & Miller, 1991).
 - ex) (a) The key to the cabinet was ...
 - (b) The key to the cabinets was ...
 - But, whether the attraction effect appears in L2 learners is yet controversial (appeared: Bannai, 2011; Lim & Christianson, 2015 / not appeared : Jiang, 2004; Chen, Shu, Liu, & Zhao, 2007)
 - RQ 1) Do Korean-English learners show the attraction effect like natives?
- Factors that can affect L2 learners' processing**
 - L1 transfer:** In Korean, the conceptual number of a noun is different from the grammatical number depending on the animacy; although the grammatical number of an inanimate noun is singular, its conceptual number in the semantic representation can be plural (Baek, 2002).
 - ex) (a) Haksayng-I (**one**) / Haksayng-tul-i (several) tochakhay-ss-ta.
Student- \emptyset -nom. Student-pl.-nom arrived.
 - (b) Na-nun sakwa-lul (**one or several**) sa-ss-ta.
I-top. apple- \emptyset -acc. bought.
 - RQ 2) Does the animacy of the local noun modulate the attraction effect?
 - Proficiency level:** High-proficient learners show more native-like processing (Van Hell & Tokowicz, 2010) and are less affected by L1 than learners in the low level of proficiency (Odlin, 1989).
 - RQ 3) Does the L1 transfer depend on the learners' proficiency?

Experiment

- Experiment Condition & Materials**
 - Condition: 2(Animacy of local noun) X 2(Number of local noun) X 2(Local agreement)
 - Materials: 512 targets (32 sentences x 8 conditions x 2 grammaticality) + 64 fillers

< Table 1. Example of materials >

Animacy of local noun	Number of local noun	Local agreement	Sentences
Animate	Plural	O	The lifeguards that saved the divers <u>were</u> ...
		X	The lifeguard that saved the divers <u>was</u> ...
	Singular	O	The lifeguard that saved the diver <u>was</u> ...
		X	The lifeguards that saved the diver <u>were</u> ...
Inanimate	Plural	O	The farmers that planted the trees <u>were</u> ...
		X	The farmer that planted the trees <u>was</u> ...
	Singular	O	The farmer that planted the tree <u>was</u> ...
		X	The farmers that planted the tree <u>were</u> ...

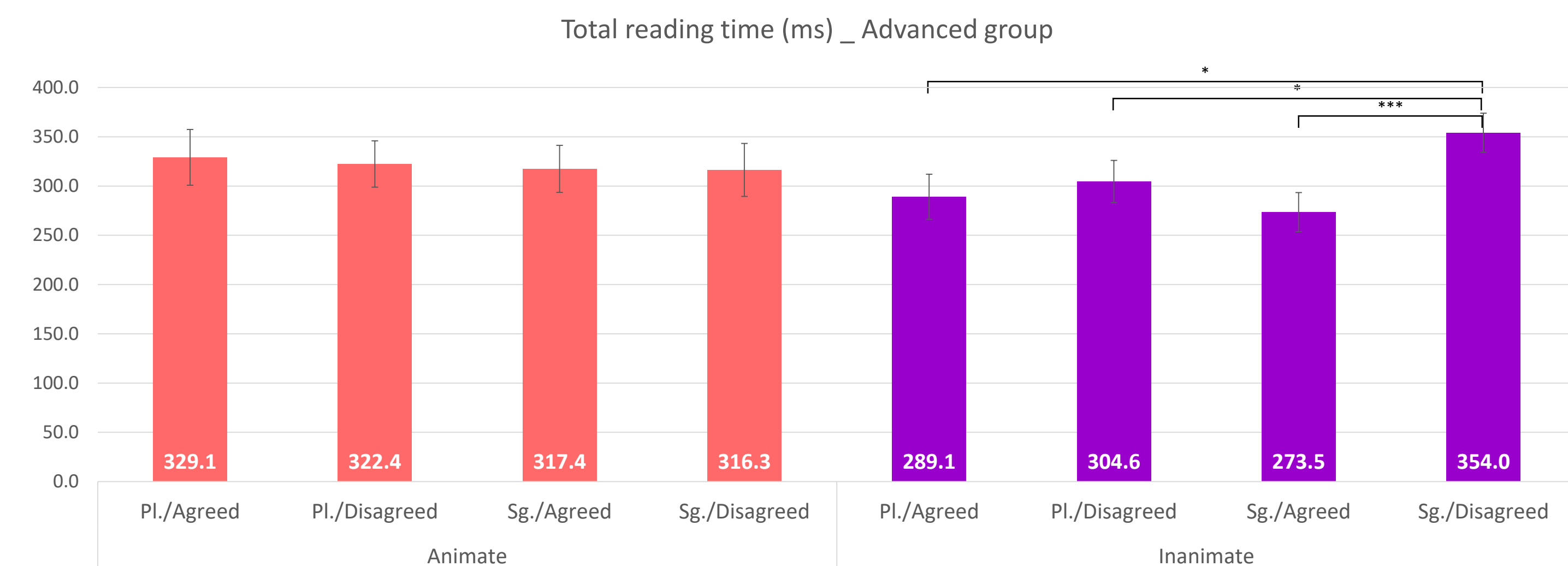
- Ungrammatical version: the number of subject noun was opposite
- Participants**
 - Advanced group: 19 EFL learners (The average of VST score was 9042).
 - Intermediate group: 19 EFL learners (The average of VST score was 7279).
- Procedure**
 - Participants' eye-movements were recorded while they read the sentences.
 - Each sentence was followed by a comprehension task (Yes/No).
 - After eye-tracking experiment, the proficiency of subject was measured by the vocabulary size test for learners version. (Beglar & Nation, 2007)
- Analysis**
 - Critical region was the main verb (were/was).
 - Measurements : Total reading time (ms), First pass reading time (ms), Go-past time (ms), Second pass reading time (ms)
 - Mixed design ANOVA was conducted in which the animacy of local noun, the number of local noun and local agreement were taken as within-subject factors and the proficiency as a between-subject factor.

Discussion

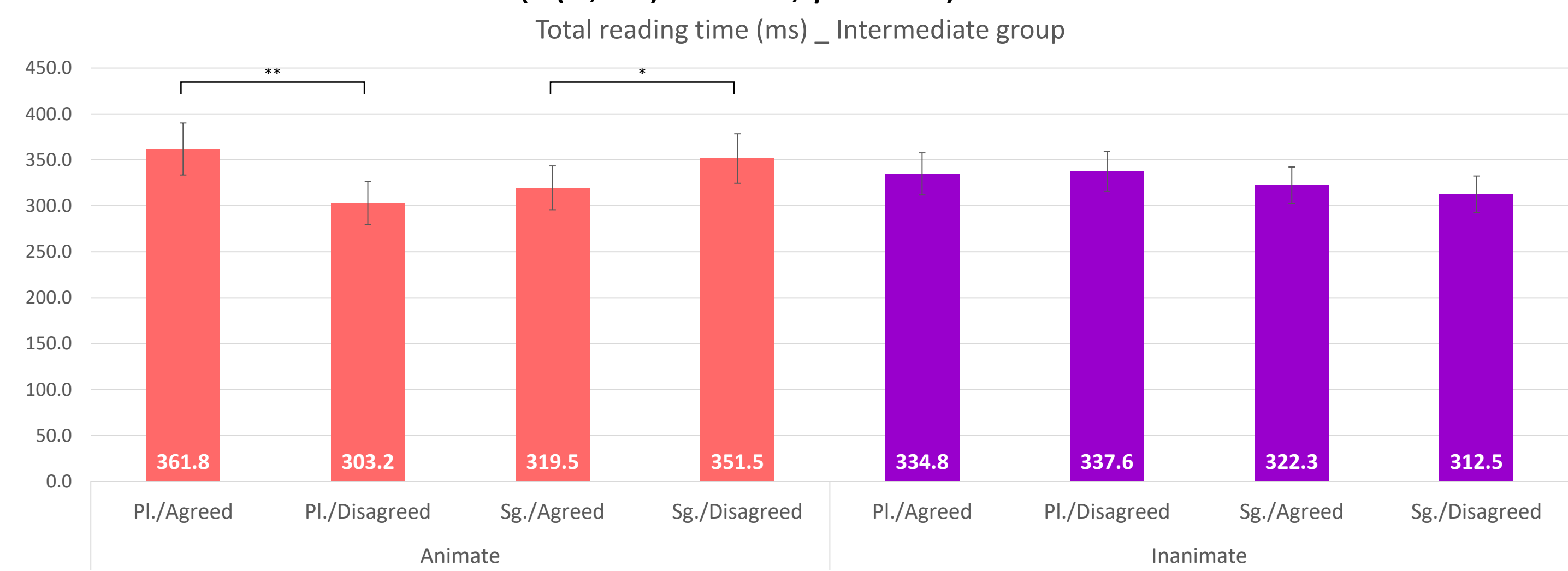
- Korean L2 learners of English showed the attraction agreement effect but it was affected by (i) the way of number representation in L1: the agreement attraction effect was modulated by the animacy of local noun (ii) the level of proficiency: the pattern of the agreement attraction effect was different depending on the learners' proficiency.
- In conclusion, our results indicated that L2 learners' number agreement processing is not completely identical to that of the native speakers due to the L1 transfer.

Results

- Total reading time**
 - The 4-way interaction effect between the animacy, the number of local noun, the local agreement and the proficiency was significant ($F(1,36)=11.630, p<0.01$).
 - Advanced group: The interaction effect between the number of local noun and the local agreement was only significant when the local noun was inanimate ($F(1,18)=4.538, p<0.05$).

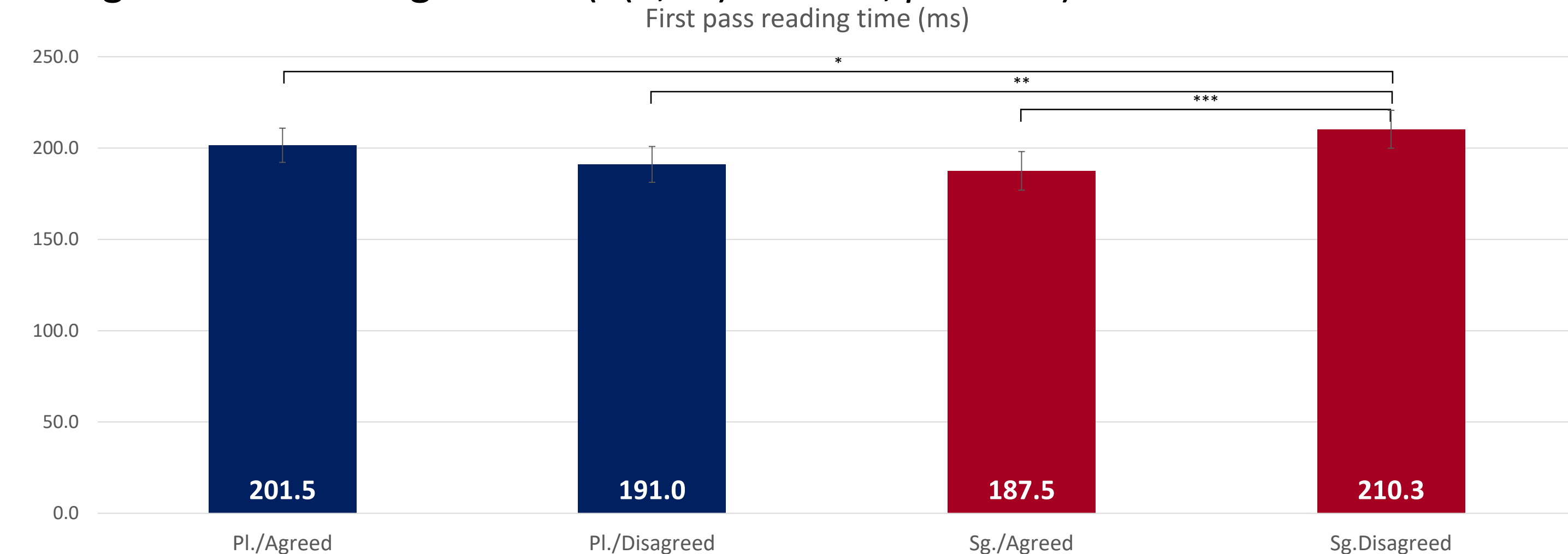


- Intermediate group: The interaction effect between the number of local noun and the local agreement was only significant when the local noun was animate ($F(1,18)=9.586, p<0.01$).



- Agreement attraction effect was not revealed when the local noun was inanimate and plural (L1 transfer).

- First pass reading time**
 - The interaction effect between the number of local noun and the local agreement was significant ($F(1,36)=19.613, p<0.001$).



- Go-past time**
 - The main effect of the animacy of local noun ($F(1,36)=4.463, p<0.05$) (animate: 307.5ms > inanimate: 270.5ms) and the proficiency ($F(1,36)=4.443, p<0.05$) (advanced: 260.0ms < intermediate: 317.9ms) was significant.

- Second pass reading time**
 - The interaction effect between the number of local noun and the local agreement ($F(1,36)=6.897, p<0.05$).

