L2 processing of Subject-Verb Agreement (SVA): they hear it but can't process it?

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English plural -s and the 3rd-person-singular -s are one of the last morphemes to be correctly produced by L2 learners, whose native language does not have an obligatory plural marker or the corresponding verb inflection. The resilient errors in English subject-verb number agreement (SVA) are described as a typical example of fossilization in L2 acquisition (Long, 2003; Han, 2004). While studies have demonstrated a gradual development of sensitivities to SVA cues in native child English speakers (Dube et al., 2016; 2019), experimental investigations of SVA processing in L2 learners remain extremely sparse.

The present study compares responses to SVA cues between native speakers of Australian English and L2 learners of English whose native language is Japanese, in which the use of plural marker suffix is non-obligatory (Nakanishi & Tomioka, 2004) and its syllable structure prohibits the fricatives /s/ and /z/ in the word final position (Ito & Armin, 1995). Thus, Japanese learners of English may fail to correctly process SVA cues due to L1-oriented perceptual insensitivity to word-final -s. In addition, the distance between the subject and the verb may impact the efficacy of SVA processing because of the burden on working memory for L2 spoken sentence processing (Kaushanskaya & Yoo, 2013).

Forty native speakers of Australian English and forty Japanese learners of English participated in the picture-sentence matching task. Participants saw two quasi-identical scenes presented side-by-side (Fig.1) and listened to a declarative sentence for which the plurality of the subject (singular vs. plural), grammaticality of the verb (grammatical vs. ungrammatical), and the length of relative clause (RC short vs. long) were manipulated (Table 1 for example). Participants were randomly assigned to either Short or Long RC groups, while the subject plurality and the verb grammaticality were crossed within participants. We tested (1) whether participants rely on the subject or verb information for choosing the picture when the sentence is ungrammatical, and (2) whether the RC length interacts with the subject plurality and verb grammaticality.

The picture selection data showed that both native speakers and L2 learners relied heavily on the presence of plural -s with the subject for the picture selection. Native speakers selected the plural picture nearly 100% of the time when they heard a plural subject, regardless of the verb grammaticality and the RC length. When they heard a singular subject (without -s), they selected the singular picture at much lower rate (Fig2, left) and their response time was slower than when they responded to singular sentences (Fig2, right). This may be partially due to the restrictive reading of the RC that made it possible to link the singular sentence to the plural picture, but with processing cost. The ungrammaticality of the verb generally slowed down the native speakers' responses (Fig2, right: Table 2 for statistics).

Like native speakers, L2 learners also showed a strong preference for selecting the plural picture: even when the subject was singular, they dominantly selected the plural picture about 70% of the time (Fig 3, left). Like native speakers, L2 learners tended to respond to singular-subject sentences more slowly (Fig3, right), although the magnitude of difference was much smaller for the L2 learners. Unlike native speakers, the grammatically of the verb did not affect the response time in the L2 learners (Table 3). Neither group showed interactions among the three factors tested.

Taken together, the present dataset suggests that the presence of -s in the sentence-initial subject impacts the SVA processing in both native speakers and L2 learners of English. Since the singular-subject did lead to about 30% choice of singular picture in L2 learners, we reject the possibility that L2 learners with Japanese as their L1 are completely insensitive to the word-final -s. However, the fact that the verb grammaticality does not seem to affect their picture selection and RT even after short RC suggests that they may not be processing the presence or absence of sentence-medial word-final -s.

Table 1: Study Design (24 target items)

Short RC: e.g., [that felt hungry]	
Grammatical	Ungrammatical
Sg: *The bear… picks…*	*The bear…. pick…*
Pl: *The bears… pick…*	*The bears… picks…*
Long RC: e.g., [that felt hungry after the long winter]	
Grammatical	Ungrammatical
Sg: *The bear… picks…*	*The bear…. pick…*
Pl: *The bears… pick…*	*The bears… picks…*

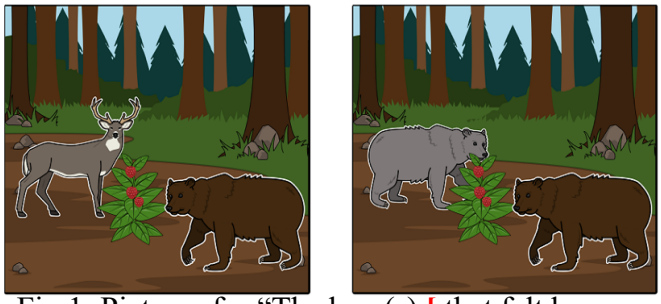

Fig.1: Pictures for "The bear(s) [that felt hungry short [after the long winter] long pick(s) berries."

Table 2: Native (n=40): Statistical results

Accuracy

	Estimate	Std. Error	z value	Pr(>|z|)	
rc	1.1514	0.6577	1.751	0.080	.
grammatical	0.3544	0.4013	0.883	0.377	
plurality	4.7547	0.5021	9.469	< 2e-16	***

RT

	Estimate	Std. Error	t value	P	
rc	170.89	182.90	0.934	0.350	
gram	-134.17	65.96	-2.034	0.042*	
pl	-702.48	65.97	-10.649.	0.000***	

No sig interaction among 3 factors confirmed for Accuracy and RT

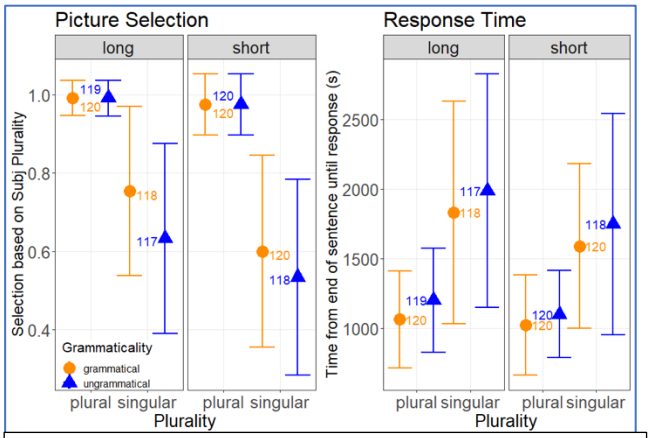

Fig 2. Native (n=40): Picture selection and RT

Table 3: L2 (n=40): Statistical results

Accuracy

	Estimate	Std. Error	z value	Pr(>|z|)	
rc	-0.0135	0.036	-0.375	0.709	
grammatical	0.0040	0.026	0.154	0.878	
plurality	0.5612	0.0454	12.352	7.78e-15	***

RT

	Estimate	Std. Error	t value	P	
rc	159.59	305.04	0.523	0.603	
gram	185.99	112.33	1.656	0.101	
pl	-407.65	141.52	-2.881	0.00675	**

No sig interaction among 3 factors confirmed for Accuracy and RT

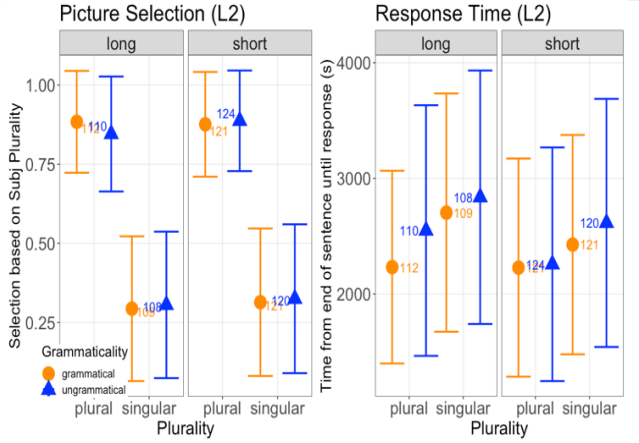

Fig 3. L2 (n=40): Picture selection and RT

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