L2 acquisition of prosodic structures of Japanese nouns by L1 English learners

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This study investigates acquisition of prosodic structures of Japanese simple and compound nouns by L1 English learners of L2 Japanese (ELJs). English is a stress language in which the prominence of a morpheme is expressed through a combination of pitch, intensity and duration (Fry, 1955; Lieberman, 1960). In contrast, Japanese is a pitch accent language in which the prominence is realized by a drop in pitch (Haraguchi, 1999). Under the assumption that Japanese pitch accents correspond to trochaic feet (Shinohara, 2000), English and Japanese prosodic structures differ in two respects. First, English and Japanese simple nouns are different in the number of feet. English simple nouns obligatorily have stress, suggesting that every PWd must contain a foot (1a). By contrast, Japanese simple nouns can be unaccented, and in this case, they have the structure without a foot (1c). Second, English and Japanese compounds differ in the number of PWds. English noun-noun compounds retain two positions of prominence (e.g. *Énglish tèacher*) (Liberman & Prince, 1977), suggesting that each noun forms a PWd individually, and the two are conjoined into a higher PWd (1d). By contrast, Japanese accented compounds form one PWd as a whole with one accent (e.g. ákita + inú → akitá-inu 'Akita dog') (Kubozono, 2008). This is shown from the accent pattern, crucially from the fact that the foot can cross over the compound boundary (1e). In this study, whether ELJs successfully produce prosodic structures of Japanese (un)accented simple nouns and accented compound nouns, in spite of the prosodic differences between the L1 and L2, is investigated.

In L2 acquisition, the Full Transfer hypothesis (Schwartz & Sprouse, 1996) suggests that the initial state for L2 acquisition is the endstate L1 grammar, and all abstract L1 properties can be transferred into the interlanguage grammar. In L2 acquisition of phonology, L1 transfer has been observed at various levels of prosodic structure, such as syllable structures (Broselow & Finer, 1991) and foot structures (Archibald, 1998). However, most studies investigating word-internal prosody focus on morphologically simplex structures or morphological complex structures in functional categories. Acquisition of morphologically complex structures, such as compounds, has been understudied. If L2ers transfer L1 prosodic structures in acquiring morphological simplex and complex structures, ELJs will initially display the structure in (1a) for unaccented simple nouns, in place of (1c). Similarly, they will display the structure in (1d) for compounds, in place of (1e). Given that a previous study (Özçelik, 2011) suggests that getting rid of feet is persistently difficult for L2ers, in addition, English has a handful of phonologically restructured compounds (e.g. *postman* is ['pous(t)mən]$_{PWd}$), it is hypothesized that acquisition of the structure in (1c) would be more difficult than the structure in (1e) for ELJs.

In the study, 9 ELJs were compared with 6 native Japanese speakers in producing real simple nouns (n=23), novel compound nouns (n=32), and real compound nouns (n=8), and the pitch (F0) and intensity were measured in Praat (Boersma & Weenink 2011). The results support the hypothesis. The pitch analysis suggests that the ELJs produced target-like simple nouns without feet in (1c) at an accuracy rate of 81%. However, the intensity analysis reveals that at least two ELJs were not target-like, producing unaccented nouns with moraic trochee feet, transferred from their L1. As for the compounds, both the pitch and intensity analysis suggest that the ELJs produced one PWd, not two PWds. The pitch analysis shows that the ELJs correctly produced one accent as in (1e) at 74% of the time. The intensity analysis shows that their feet crossed over morpheme boundary. These results suggest that modification of existing prosodic constituents, PWds, is acquirable at early stages of development, whereas elimination of existing prosodic constituents, feet, is more problematic.

Table 1 Differences between English and Japanese prosodic structures

	English	Japanese	
	Accented	Accented	Unaccented
Simple Nouns	(1a) PWd | Ft | N	(1b) PWd | Ft | N	(1c) PWd | N (footless)
Compounds	(1d) PWd → PWd PWd; Ft Ft; N_1 N_2	(1e) PWd | Ft | N_1 N_2 (either N_1 or N_2 is deaccented)	(1f) PWd | N_1 N_2 (footless)

Table 2 Results of pitch analysis

L2 structures (simple nouns)		L2 structures (compounds)
Accented	Unaccented	Accented
(1b) target-like PWd | Ft | N	(1c) target-like PWd | N	(1e) target-like PWd | Ft | N_1 N_2
Accuracy rate 29%	Accuracy rate 81%	Accuracy rate 74%

Table 3 Stimuli examples of novel compounds H: high tone, L: low tone, underlined tones bear accents

co-nd	compound accent patterns	examples	N_1 (1 or 3 morae)		N_2 (2 or 3 morae)		CA formation	
							N_1 accent	N_2 accent
1	LH<u>H</u>-LL	ka.ra.sú-futa	<u>H</u>LL	ká.ra.su 'crow'	LH	fu.ta 'lid'	move	-
2		ka.ra.sú-pan	<u>H</u>LL	ká.ra.su 'crow'	<u>H</u>L	pá.n 'bread'	move	deaccent
3		usagí-futa	LHH	u.sa.gi 'rabbit'	LH	fu.ta 'lid'	create	-
4		usagí-pan	LHH	u.sa.gi 'rabbit'	<u>H</u>L	pá.n 'bread'	create	deaccent
5	LHH-<u>H</u>LL	ka.ra.su-zúbon	<u>H</u>LL	ká.ra.su 'crow'	<u>H</u>LL	zú.bo.n 'pants'	deaccent	-
6		ka.ra.su-tókee	<u>H</u>LL	ká.ra.su 'crow'	LHH	to.ke.e 'clock'	deaccent	create

Selected references

Archibald, J. (1998). *Second language phonology.* Philadelphia: John Benjamins.

Broselow, E., & Finer, D. (1991). Parameter setting in second language phonology and syntax. *Second Language Research 7*, 35-59.

Haraguchi, S. (1999). Accent. In N. Tsujimura (Ed) *The handbook of Japanese linguistics*. Oxford: Blackwell.

Kubozono, H. (2008). Japanese accent. In S. Miyagawa & M. Saito (Eds.) *The Oxford handbook of Japanese linguistics*, 165-191. Oxford: Oxford University Press.

Özçelik, Ö. (2011). *Representation and acquisition of stress: The prosodic subset principle and the case of Turkish*. PhD dissertation. McGill University.

Shinohara, S. (2002). Metrical constraints and word identity in Japanese compound nouns. *MIT working papers in Linguistics, 42*, 311-328.

Schwartz, B. & Sprouse, R. (1996). L2 cognitive states and the full transfer/full access model. *Second Language Research 12*, 40-72.