ACQUISITION OF PROSODY OF GIVEN INFORMATION
BY MANDARIN-SPEAKING EFL LEARNERS

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This study investigated Mandarin-speaking English-as-a-foreign-language (EFL) learners' acquisition of the prosodic marking of different types of given information in English: given information indicated by pronoun, by repetition, and by synonymy. Eighty learners at preliminary, lower intermediate, upper intermediate and advanced levels (20 in each group) and 20 native English speakers participated in a question-answer reading task. The results of auditory and acoustic analyses of the participants' production showed that the learners performed differently for the three types of given information in terms of both assignment and phonetic realization of deaccentuation. In addition, in terms of deaccentuation assignment, the learners performed the best on pronoun and the worst on synonymy and exhibited much greater variations between the types than the native speakers, and their performance improved with proficiency. In terms of phonetic realization of deaccentuation, however, the learners produced F0 ratios and intensity ratios comparable to the native speakers but lower duration ratios, which approached the native speakers as their proficiency increased. Based on these findings, some pedagogical implications are discussed.

INTRODUCTION

Deaccentuation of given information helps to highlight prominence on new information (Cruttenden, 1997), which is key to successful communication (Jenkins, 2000). However, the prosody of given information is difficult to acquire for English learners. They tend to stress more words in an utterance than native English speakers and thus may fail to communicate effectively. To help learners overcome this problem, we need to firstly pinpoint where exactly their difficulty is in acquiring prosody of given information. This study, therefore, took Mandarin EFL learners as a sample and examined their acquisition of prosody of given information.

Prosody of Given Information in English and Mandarin

English and Mandarin share similarities in prosody of given information. In both languages, given information is phonologically marked with deaccentuation (Ladd, 1996; Cruttenden, 1997) and phonetically realized with drastically reduced values in duration, F0 and intensity (Xu & Xu, 2005). However, in Mandarin, deaccentuation of given information occurs less frequently than in English. Deaccentuation of given information occurs after both broad focus and narrow focus in English, but mainly after narrow focus in Mandarin, as given information rarely occurs in an utterance-final position in broad focus (Chui, 2005).

According to Halliday (1967), given information can take three forms: reference, substitution, and ellipsis. Reference involves using a pronoun to replace previously mentioned information or simply repeating it. Using a pronoun changes the grammatical category, while repeating is basically a pragmatic function. In this study the former is labeled as "pronoun" and the latter "repetition". Substitution refers to using a synonym to replace previously mentioned information, which is related to the semantic meaning of given information and is labeled as "synonymy" in this study. Ellipsis refers to omitting previously mentioned information. Since given information is omitted in ellipsis, it does not take any form of prosody and is thus excluded in this study. The following are examples for the four subtypes of given information:

(i) Reference-Pronoun
    --What do you think of this dress?   --I like <u>it</u>.
(ii) Reference-Repetition
    --Shall we have tea?   --I don't like <u>tea</u>.
(iii) Substitution-Synonymy
    --Let's have lunch now.   --I've had my <u>meal</u>.
(iv) Ellipsis
    --Who called me?   --John.

Although deaccentuation exists in both English and Mandarin, Mandarin-speaking English learners still fail to deploy deaccentuation as native English speakers do. One reason may be that deaccentuation is less frequent in Mandarin. Another may be that prosody is not directly transferred from one's native language (L1) to their second/foreign language (L2) but learned anew even if their L1 and L2 share similar prosodic patterns (Grosser, 1993).

L2 Acquisition of Prosody of Given Information

Deaccentuation of given information is reported to be difficult to acquire for English learners from different L1 backgrounds, who tend to pronounce given information with equal stress as focus in their speech (Gut & Pillai, 2014; Hua & Li, 2016, 2019; Wennerstrom, 1994, 1998). Phonetically, English learners tend to produce smaller variation in duration, F0 and intensity for focus and given information than native English speakers (Gut & Pillai, 2014; Nguyen et al.,2008).

As regards L1 Mandarin English learners, apart from producing equal stress on focus and given information (Wennerstrom, 1994, 1998; Hua & Li, 2016), they are also reported to have the tendency of stressing utterance-final pronouns (Juffs, 1990; Deterding, 2010). Phonetically, they tend to produce shorter duration and lower average F0 and maximum F0 for focus than native speakers but native-like duration and F0 for given information (Hua & Li, 2019).

It seems that Mandarin-speaking English learners tend to stress given information expressed in the forms of both function words (pronouns) and content words as they stress focus. However, it is unclear whether the different forms of given information are equally learnable to these learners. In light of this, this study examined Mandarin-speaking English learners' acquisition of deaccentuation for the different form types of given information, namely, pronoun, repetition, and synonymy.

Research Questions

The research questions are specified as follows:
1) Do Mandarin-speaking EFL learners acquire deaccentuation for the three types of given information to the same extent?

2) Do Mandarin-speaking EFL learners acquire phonetic realization for the three types of given information to the same extent?

METHODS

This was a quantitative study with a cross-sectional experimental design.

Participants

The participants were 80 Mandarin-speaking EFL learners and 20 native English speakers (Table 1). The 80 learners took a Cambridge English proficiency test and were divided into four proficiency groups: preliminary, lower intermediate, upper intermediate, and advanced. Each group had 20 members, 10 male and 10 female. They were all from central and north China, which belongs to the Northern dialect region in China. They were typical EFL learners as only a few had visited English-speaking countries.

The native speakers served as controls. Most of them were international students at a university in central China, some were full-time English teachers at language training centers, and several were students and teachers at a university in Hong Kong.

Table 1

Demographics of Participants
a.   Mandarin-speaking EFL Learners

Gender		Major		Mean Age	Mean Age of Acquisition	Mean Years of English Learning	Mean Months in English-speaking Countries
M	F	English	Other				
40	40	64	16	19.95	9.14	10.83	0.09

b.   Native English Speakers

Gender		Country		Mean Age	Mandarin-speaking (preliminary level)	Non-Mandarin-speaking
M	F	U.K.	U.S.			
10	10	15	5	27.17	3	17

Stimuli

The stimuli were 12 question-answer pairs (four pairs x three types) (see Appendix). The questions were used to elicit the different types of given information in the answers, which were the target utterances. All words in the stimuli were within the first 2000 words in the New General Service List (Browne, Culligan & Phillips, 2013), which means that they were all high frequency words commonly used in daily communication. All answers contain at most six words, which is the average length of an information unit in English (Crystal, 1969).

All question-answer pairs, including the 12 stimuli and an additional 12 pairs as fillers, were randomized and imbedded in a PowerPoint file. Upon clicking on each slide, the participants would see the transcripts of the question and answer and hear a male British English speaker's recording of the question. As required, they read each answer twice immediately after hearing the question.

Procedures

After signing an informed consent form and taking a short trial session, the participants were recorded individually in a sound-treated room with a Sony linear PCM recorder (model PCM-D100), in the WAV format, with a sampling rate of 44.1 kHz at 16 bits. The recordings were then processed for auditory analyses. For most sentences, the first reading was selected as it was generally more natural and more fluent. In the rare cases where there was a mistake or disfluency in the first reading, the second reading was selected. In total there were 1200 sentence recordings for auditory analysis.

For acoustic analysis, six sentences were selected (two sentences x three types). In the six sentences, the target words (words signifying given information) were all monosyllables containing a long vowel or a diphthong. The recordings of these six sentences with deaccented target word were picked out and annotated manually in Praat (Boersma & Weenink, 2018) at syllable level. Those with improper F0 and intensity display were excluded, totaling 263 (native: 72, advanced: 55, upper intermediate: 58, lower intermediate: 39, preliminary: 39).

Data Analysis

Auditory Analysis

The auditory analysis was done by two experts and a naïve rater. The expert raters were both native Mandarin speakers highly proficient in English and researching English phonetics and phonology. The naïve rater was a female native British English speaker aged 20, who had received no training in linguistics or English phonetics and phonology.

The first expert rated all sentence recordings twice, giving 1 for deaccentuation of the target word and 0 for non-deaccentuation of the target word. The intra-rater reliability was .98 (SPSS 26.0, Cronbach's alpha). The disagreements between the two ratings were settled by a third rating. Then one fifth (240) of the recordings were rated by the other two raters. The inter-rater reliabilities reached .81, .91, and .90.

Acoustic Analysis

Five parameters were included in the acoustic analysis: duration, average F0, maximum F0, average intensity, and maximum intensity, as they were found to be the best indicators of information status in English (Breen et al., 2010). The values of these parameters were extracted using Praat scripts and then converted to ratios by dividing the value of the target monosyllabic word by the average value of the syllables in the same utterance excluding the word carrying prominence.

Statistical Analysis

Factorial ANOVAs were run in SPSS 26.0 for comparative analyses of the scores from the auditory analysis and the ratios from the acoustic analysis.

RESULTS

Results of Auditory Analysis

Research Question One asked if Mandarin-speaking EFL learners acquire deaccentuation for the three types of given information to the same extent. The auditory analysis showed that the learners performed differently on the three types (Table 2). A two-way ANOVA test revealed differences by group (F (4, 285) = 38.28, $p < .001$), and by type (F (2, 285) = 100.71, $p < .001$), and an interaction between group and type (F (8, 285) = 2.17, $p = .030$).
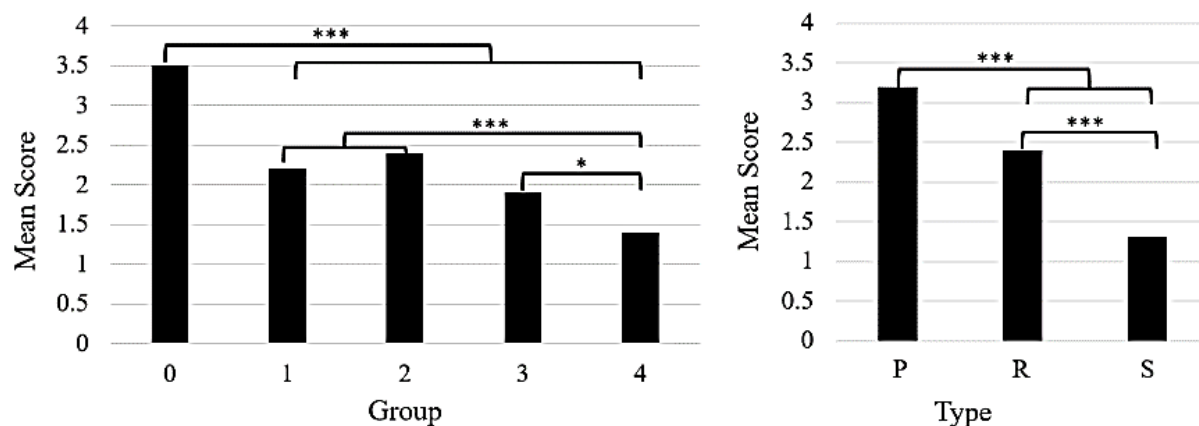
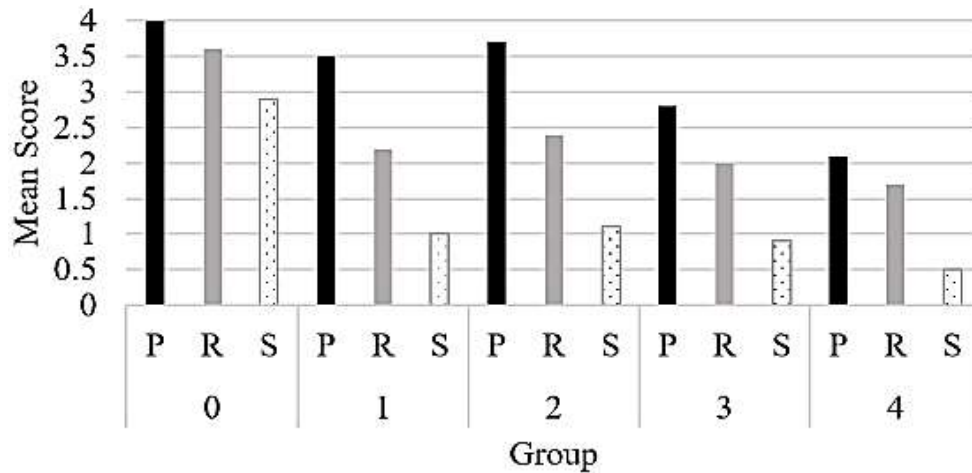**Table 2**

Score (SD) by Group and Type

	Native	Advanced	Upper Intermediate	Lower Intermediate	Preliminary
Pronoun	4.00(-)	3.45(0.93)	3.65(0.61)	2.83(1.37)	2.05(1.31)
Repetition	3.63(0.56)	2.18(0.96)	2.40(0.97)	1.98(0.95)	1.70(1.01)
Synonymy	2.85(1.10)	1.03(1.14)	1.05(0.87)	0.93(1.07)	0.48(0.80)

Post-hoc tests with Bonferroni correction (Figure 1) revealed that the learners' scores were lower than the native speakers' and that the scores of lower proficiency learner groups were lower than those of higher proficiency learner groups. Moreover, all groups achieved the highest scores for pronoun and the lowest score for synonymy. In addition, the differences between the three types were much smaller in the native speaker group than in each of the four learner groups.

Figure 1

Post-hoc test results for score.

0=native; 1=advanced; 2=upper intermediate; 3=lower intermediate; 4=preliminary
P=pronoun; R=repetition; S=synonymy
*=significant at .05 level; ***=significant at .001 level

Results of Acoustic Analysis

Research Question Two asked if Mandarin-speaking EFL learners acquire phonetic realization for all three types of given information to the same extent. The acoustic analysis revealed that the learners realized the three types differently.

Duration

The five groups produced different duration ratios for the three types (Table 3). A two-way ANOVA test revealed differences by group ($F_{(4, 285)} = 7.89$, $p < .001$) and by type ($F_{(2, 285)} = 126.34$, $p < .001$), but no interaction between group and type ($F_{(8, 285)} = 1.63$, $p = .118$).
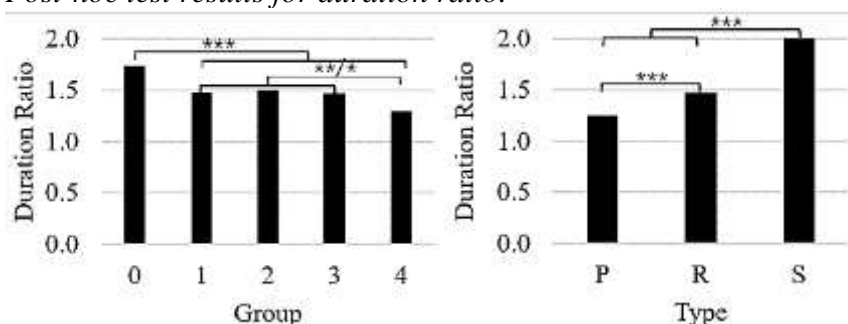
Table 3

Duration Ratio (SD) by Group & Type

	Native	Advanced	Upper Intermediate	Lower Intermediate	Preliminary
Pronoun	1.35(0.15)	1.28(0.21)	1.20(0.18)	1.22(0.23)	1.17(0.17)
Repetition	1.54(0.21)	1.50(0.20)	1.46(0.23)	1.58(0.26)	1.30(0.22)
Synonymy	2.19(0.46)	2.13(0.31)	2.16(0.44)	1.98(0.17)	1.63(0.23)

Post-hoc tests (Figure 2) revealed that the native speaker group produced a higher duration ratio than all the learner groups and that the higher proficiency learner groups produced higher duration ratios than the lower proficiency groups. Moreover, all groups produced the highest duration ratio for synonymy and the lowest duration ratio for pronoun.

Figure 2

Post-hoc test results for duration ratio.

0=native; 1=advanced; 2=upper intermediate; 3=lower intermediate; 4=preliminary
P=pronoun; R=repetition; S=synonymy
*=significant at .05 level; **=significant at .01 level; ***=significant at .001 level

The five groups produced different F0 ratios (Table 4). A two-way repeated-measures ANOVA test revealed a difference by type (F (2, 285) = 3.62, p = .028), but no difference by group (F (4, 285) = 1.29, p = .274), and no interaction between type and group (F (8, 285) = 0.84, p = .567).
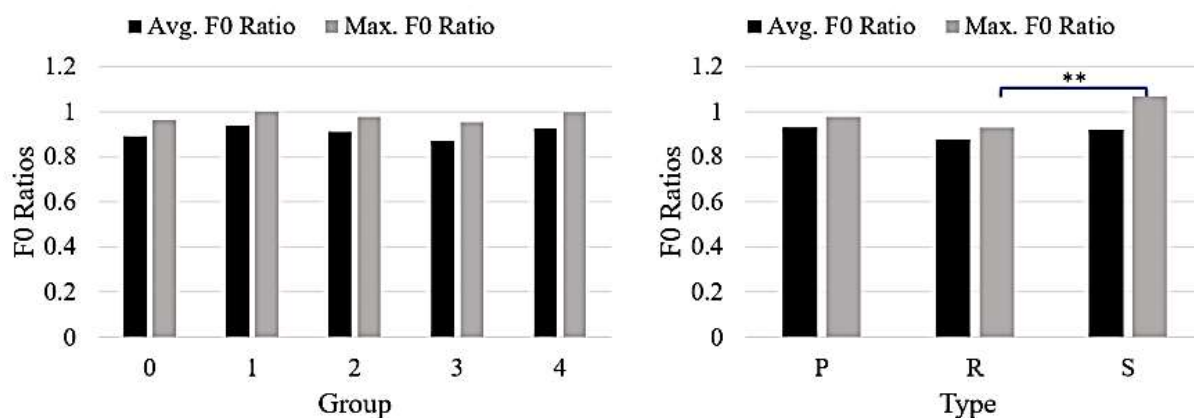
Table 4

F0 Ratios (SD) by Group and Type

		Native	Advanced	Upper Intermediate	Lower Intermediate	Preliminary
Avg. F0	Pronoun	0.90(0.11)	0.93(0.15)	0.94(0.15)	0.91(0.16)	0.97(0.20)
	Repetition	0.87(0.24)	0.92(0.17)	0.88(0.17)	0.82(0.18)	0.89(0.18)
	Synonymy	0.91(0.29)	1.00(0.11)	0.90(0.12)	0.91(0.08)	0.90(0.23)
Max. F0	Pronoun	0.93(0.13)	0.95(0.16)	0.97(0.17)	0.99(0.19)	1.06(0.21)
	Repetition	0.90(0.29)	0.92(0.22)	0.97(0.28)	0.92(0.30)	0.94(0.26)
	Synonymy	1.04(0.33)	1.30(0.27)	1.02(0.19)	0.95(0.08)	1.03(0.16)

Post-hoc tests (Figure 3) revealed that the maximum F0 ratio was higher for synonymy than for repetition, but there were no other differences between the three types in maximum F0 ratio or average F0 ratio.

Figure 3

Post-hoc test results for F0 ratios

0=native; 1=advanced; 2=upper intermediate; 3=lower intermediate; 4=preliminary
P=pronoun; R=repetition; S=synonymy
**=significant at .01 level

Intensity

The five groups produced different intensity ratios (Table 5). A two-way repeated-measures ANOVA test showed a difference by type ($F_{(2, 285)} = 4.14$, $p = .017$) but not by group ($F_{(4, 285)} = 0.57$, $p = .685$), and no interaction between type and group ($F_{(8, 285)} = 0.88$, $p = .531$).
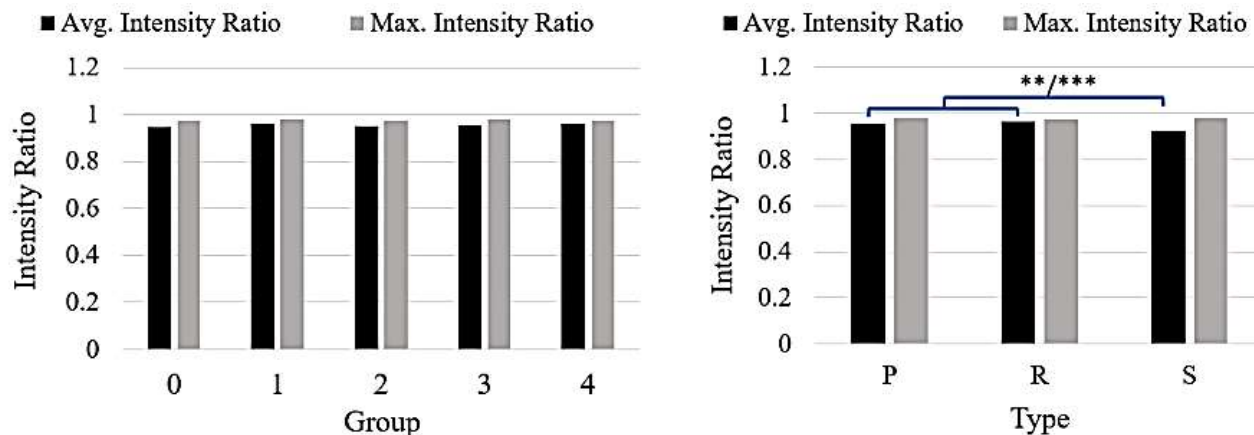
Table 5

Intensity Ratios (SD) by Group and Type

		Native	Advanced	Upper Intermediate	Lower Intermediate	Preliminary
Avg. Int.	Pronoun	0.95(0.03)	0.96(0.03)	0.95(0.03)	0.95(0.02)	0.96(0.02)
	Repetition	0.97(0.04)	0.98(0.04)	0.95(0.04)	0.97(0.02)	0.96(0.05)
	Synonymy	0.92(0.04)	0.92(0.03)	0.93(0.03)	0.93(0.04)	0.96(0.05)
Max. Int.	Pronoun	0.97(0.02)	0.98(0.02)	0.97(0.02)	0.98(0.02)	0.98(0.02)
	Repetition	0.97(0.03)	0.97(0.03)	0.97(0.03)	0.98(0.02)	0.97(0.04)
	Synonymy	0.98(0.03)	0.98(0.01)	0.98(0.02)	0.98(0.02)	0.98(0.01)

The post-hoc test results (Figure 4) showed a lower average intensity ratio for synonymy than for pronoun and repetition but no other differences in intensity ratios.

Figure 4

Post-hoc test results for intensity ratios.

=significant at .01 level; *=significant at .001 level

DISCUSSION

This study investigated Mandarin-speaking EFL learners' acquisition of deaccentuation for different types of given information. It was found that the learners' acquisition was unbalanced for the three types of given information and for the phonological and phonetic properties.

Phonologically, as indicated by the scores yielded from the auditory analysis, the learners achieved different levels of acquisition for the three types of given information and their performance for the different types varied more greatly than the native speakers'. More specifically, they acquired deaccentuation for pronoun the best and deaccentuation for synonymy the worst. This seems inconsistent with previous findings that Mandarin-speaking EFL learners tend to stress utterance-final pronouns (Deterding, 2010; Hua & Li, 2016; Juffs, 1990). One explanation is that those studies did not compare the L2 acquisition of deaccentuation for different forms of given information but directly compared their acquisition of deaccentuation of given information (expressed by pronoun mostly) with their acquisition of prominence for focus. The finding reported here suggests that while Mandarin-speaking EFL learners are poor at deaccenting utterance-final pronouns, they are even poorer at deaccenting utterance-final given information in other forms (i.e., expressed by repetition and synonymy). The learners' better acquisition of deaccentuation of pronoun may be attributed to the explicit grammatical knowledge they had acquired in the process of English learning. Such explicit knowledge might raise their sensitivity to word class. Hence their better acquisition for pronouns.

In addition, the learners, even at the advanced level, performed much worse (indicated by their lower scores) in deaccenting given information than the native speakers. This supports previous findings that L2 English learners are generally poor at deaccenting given information (e.g., Hua & Li, 2016, 2019; Wennerstrom, 1994, 1998). However, the learners did show a tendency of learning, as the higher proficiency groups performed better than the lower proficiency groups.

Phonetically, the learners also realized the different types of given information unevenly. While they produced similar average F0 and maximum intensity for all three types, they produced the longest duration for synonymy and the shortest for pronoun, higher maximum F0 for synonymy than for repetition, and lower average intensity for synonymy than for pronoun and repetition. Although the comparisons are not consistent, in general this suggests that the learners realized pronoun and repetition better than synonymy, which echoes their better acquisition of deaccentuation for pronoun and repetition than for synonymy, as discussed above. This is probably because pronoun and repetition are more conspicuous as one involves the change of word class and the other repeated mentioning of the same word, but synonymy is more implicit compared with the other two forms.

In addition, the learners produced comparable ratios to the native speakers for four of the five parameters (all F0 and intensity ratios) but lower duration ratios than the native speakers. This finding is partially consistent with Hua and Li (2019), who report native-like F0 and duration produced by Mandarin-speaking EFL English learners for given information. A possible explanation for this discrepancy could be that Hua and Li (2019) investigated Mandarin-speaking EFL learners' acquisition of prosody of both focus and given information and included fewer types of given information in the stimuli, whereas this study specifically focused on L2 acquisition of deaccentuation covering more types of given information.

Moreover, the learners in this study produced lower duration ratios for unstressed given information than the native speakers. However, previous studies generally report that L2 English learners often fail to vary syllable length with stress and produce longer duration for weak syllables than native English speakers (e.g., Gut & Pillai, 2014; Nguyen et al., 2008). One explanation for this discrepancy is the issue of final lengthening, which is inevitable as deaccented given information is located in the utterance-final position. The shortened duration of utterance-final given information is relative to the duration of utterance-final focus. This has been supported empirically by Hua and Li (2019), who found lower duration ratios for utterance-final given information than utterance-final focus in both native English speakers and L2 English learners. Therefore, the lower duration ratios produced by the learners here does not necessarily indicate better deaccentuation than the native speakers. Probably the learners would also produce shorter duration for utterance-final focus than the native speakers, thus achieving a comparable effect of duration shortening in Hua and Li (2019). Thus, how to best calculate duration ratio for deaccentuation merits further scrutiny.

Based on the findings above, some pedagogical implications can be drawn. To begin with, it is more important to teach the "where" (phonological aspect) than the "how" (phonetic aspect) of deaccentuation of given information. With increasing English proficiency, the learners improved in assigning deaccentuation but not so much in phonetically realizing it because of a ceiling effect for F0 and intensity but not duration. Therefore, it is more urgent to train these learners to assign deaccentuation to given information rather than to phonetically realize deaccentuation. If there is sufficient time, learners can be additionally trained to deploy duration for deaccentuation.

In addition, as the EFL learners in this study acquired the prosody of different types of given information unequally, English teachers need to teach learners in similar EFL contexts that given information, no matter whether it is expressed by pronoun, repetition or synonymy, is generally deaccented in speech. Learners should be informed that deaccentuation of given information overruns the grammatical, pragmatic, and semantic features of given information.

To achieve the above two goals, teachers need to first raise learners' awareness of deaccentuation of given information, and then help them develop related motor skills through drilling practices before moving on to apply deaccentuation in more spontaneous, communicative activities.

This study is not exempt from limitations. It only examined controlled L2 speech in a cross-sectional manner. Future studies may examine spontaneous L2 speech and follow L2 prosody development in a longitudinal way. In addition, L2 English learners from more L1 backgrounds should be investigated for a thorough understanding of L2 acquisition of prosody of given information.

ABOUT THE AUTHOR

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APPENDIX

The stimuli

(The underlined words are the target words, and the sentences in bold are for the acoustic analysis.)

Pronoun

--Who's that girl? **--I don't know her.**

--Will Sue agree to help? **--Let's hope so.**

--What's the secret? --You already know it.

--Where's Peter? --I didn't see him.

Repetition

--Have a cup of tea?   **--I don't drink <u>tea</u>.**

--Did John eat the pie?   **--John hates the <u>pie</u>.**

--Does Jim know Lynn?   --Jim loves <u>Lynn</u>.

--Is Sue a good mum?   --Sue is not a <u>mum</u>.

Synonymy

--What's the noise?   **--I didn't hear a <u>sound</u>.**

--Have some chocolates?   **--I don't eat <u>sweets</u>.**

--Do you have a dog?   --I don't keep <u>pets</u>.

--Shall we see Harry Potter? --I've watched the <u>film</u>.