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A short teaching intervention on word-stress rules and pronunciation learning strategies: An exploratory study

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Research has shown that word stress is important for improved intelligibility in an EFL context (e.g., Cutler, 2015, Levis, 2018). However, instruction on word stress is frequently avoided in the EFL classroom due to time limitation, which begs the question whether a shift of focus from classroom learning to autonomous learning by exploiting learning strategies is a viable option for overcoming time constraints. For instance, longer instruction in language learning strategy use has led to the improvement of general oral proficiency (Nakatani, 2005) or specific pronunciation features such as word stress, linking, and primary phrase stress among learners with different L1s (Sardegna, 2011, 2012; Sardegna & Dickerson, 2023), as well as greater learner autonomy.

This study investigates whether short word stress and strategy instruction yields improvement in learners with the same L1 in an EFL classroom setting. Forty Macedonian learners were assigned to a treatment and a control group (n = 20 each) and completed pre-, post-, and delayed post-tests. Only the treatment group received a four-week instruction which targeted stress placement in polysyllabic words based on four word-stress rules following the Covert Rehearsal Model (CRM) (Hahn & Dickerson, 1999). Learners were also taught to use pronunciation learning strategies (PLSs) for self-regulated practice out of class and completed a strategy diary. Results show that even a short teaching intervention on word stress and strategy use is beneficial for learners' ability to accurately apply word stress rules in production.

Keywords: pronunciation instruction, word-stress rules, pronunciation learning strategies, Covert Rehearsal Model (CRM)

1 Introduction

Word stress has received divided attention in pronunciation instruction over the years – from being prioritised as a feature leading to intelligible speech, to being considered a non-core feature in the Lingua Franca Core (Jenkins, 2000). Recently, its importance for intelligibility has been more widely acknowledged, as studies have shown that accurate word stress placement contributes to more intelligible non-native speech (Hahn, 2004) and that stress misplacement at the beginning of a conversation could affect word decoding thus hindering further message processing (Levis, 2018).

Unlike languages where stress is fixed to a particular syllable in a word, English word stress is lexically designated, i.e., its placement is governed by the word itself. Non-native learners coming from diverse linguistic backgrounds have difficulty predicting English word stress. They may mainly rely on their intuition and L1 stress patterns because descriptive stress rules seem complicated. Despite this, some authors argue that English word stress is not as random as it appears (Fritz & Kotzor, 2022) and it can be predicted in polysyllabic words by use of orthography-based rules (Dickerson, 2013, 2015). Word stress is also regarded as teachable and learnable; research shows improvement in word stress acquisition through teaching simplified rule-based strategies (Sardegna & Dickerson, 2023).

The current study explores the acquisition of English word stress by Macedonian EFL learners through the use of predictive stress-placement rules and learning strategies as described in the Covert Rehearsal Model (CRM) (Dickerson, 2013; Hahn & Dickerson, 1999). Such instruction assumes important roles for both teachers and learners; teachers are expected to select appropriate strategies and design suitable materials (Oxford, 1990), while learners are expected to use the strategies to guide them to more autonomous learning and to encourage further practice outside the classroom (Sardegna, 2011).

2 Previous research

Strategy instruction presupposes the identification of appropriate pronunciation learning strategies (PLSs), which have been defined as "steps taken by students to enhance their own pronunciation learning" (Peterson, 2000, p. 7). Although different studies employ diverse taxonomies that yield different results, strategy instruction with PLSs has proved to be effective in promoting learner autonomy and depends on various factors such as target feature, duration of teaching intervention, type of assessment, and strategy classification (Pawlak & Szyszka, 2018). Research evidence suggests that the success of strategy use in improving a particular pronunciation feature can be conditioned by the task type and learner's pronunciation knowledge. For instance, Szyszka (2021) had 58 first-year English majors (identified as high- or low-achievers) fill in a questionnaire that elicited PLSs they used while completing six tasks on vowels and diphthongs. She found that while some strategies were employed across all six tasks, there were differences in use between the high- and low-achievers, with the former group using a greater number and wider range of PLSs than the latter.

Strategy instruction has led to favourable results with various phonological phenomena. For instance, Haslam (2010) found that certain PLSs accounted for accuracy and improved comprehensibility, but not global foreign accent and fluency among EFL and ESL learners after a 10-week instruction on strategy use. Another instance is Ingels (2011) who investigated whether a self-monitoring program over a 16-week period improved participants' suprasegmental features. The results revealed that the self-monitoring strategies (critical listening, transcription, annotation, and rehearsal of corrections) led to improvement mainly in identifying message unit boundaries, linking, and vowel reduction in function words. Furthermore, Sardegna and MacGregor's results (2013) showed that scaffolded teaching with

PLSs led to the improvement of read-aloud accuracy of vowel reduction, linking, primary stress, and intonation during a 15-week intervention.

Research also shows that use of PLSs enhances learners' autonomous learning. Dickerson (2013, p. 5), for instance, suggests using the Covert Rehearsal Model (CRM), which aims to equip learners with a set of rules and learning strategies that guide them during their private practice of target structures. The CRM is a self-practising learning sequence consisting of six steps that centres around the concept of strategy instruction, where learners practice aloud in privacy out of class (steps 1 and 2), then they self-monitor and compare their performance with other models (steps 3 and 4), and finally they self-correct their performance and practice until satisfied and fluent (steps 5 and 6). The effectiveness of the CRM regarding different pronunciation features, including word stress, has been documented by a series of studies carried out by Sardegna (2011, 2012) and Sardegna and Dickerson (2023). In Sardegna (2011), the results indicate that a four-month intensive instruction with PLSs led to short- and long-term improvement in linking among learners with different L1s. In another study, Sardegna (2012) investigates the effect of individual learner differences when mastering linking and English word stress and found that these differences can predict individual progress over time. Sardegna and Dickerson (2023) tested the effect of three stress rules on the improvement of English word stress use by focusing on the extent to which ESL learners with different L1s practised in covert rehearsal and used PLSs after the instruction period. The findings reveal that the instruction led to improvement in the intervention group for all three stress rules. With regard to PLS use, the results showed a preference for perception strategies over prediction and production strategies.

Despite these promising results, there is insufficient research into strategy instruction focusing on word-stress rules with learners of a shared L1 and for a short instructional period. The current study aims to fill this gap by investigating a short strategy instruction in covert rehearsal for English word stress by Macedonian L1 learners. Given that Macedonian word stress is fixed and falls on the first syllable in disyllabic words or on the antepenultimate syllable in three or more syllable words (Koneski, 2004), Macedonian learners might regard English word stress placement as arbitrary and irregular. Hence, they could benefit from a specific instruction that equips them with a set of rules and learning strategies for practising English word stress placement.

3 Research methodology

3.1 Research questions

Considering the importance of word stress for intelligibility and the potential of the CRM for promoting learner autonomy, the present study aims to answer the following research questions:

RQ1: Does a four-week teaching intervention with the CRM approach lead to improvement of learners' word-stress placement in polysyllabic words? Which stress rule pattern (KSR, VSR, LSR, PSR) is the most effectively learnt?

RQ2: What learning strategies are used by learners in covert rehearsal?

3.2 Participants

Forty Macedonian EFL learners participated in the study. They were divided into a treatment group (n = 20; M = 3, F = 17; M_{age} = 20, age range 19–28) and a control group (n = 20; M = 3, F = 17; M_{age} = 19.45, age range 19–21). The participants were first-year English majors at Ss.

Cyril and Methodius University in Skopje, enrolled in the course Modern English 2 which targets language skills at B2 level according to the Common European Framework of Reference for Languages (Council of Europe, 2001). They had no prior formal knowledge or instruction in English pronunciation.

To determine whether the groups were similar or different in their performance at pre-test (T1), a *t*-test for independent groups was conducted. The results show that there was no statistically significant difference between the two groups at T1 with regard to their initial combined read-aloud accuracy scores ($t(38) = -0.18$, $p > 0.05$; $M_{TG} = 11.45$ vs. $M_{CG} = 11.6$). This indicated that the two groups were similar enough to be compared in further analyses (see §3.4).

3.3 Treatment procedure

Only the treatment group received formal instruction on four orthographic word-stress rules for polysyllabic words (Hahn & Dickerson, 1999): Key Stress Rule (KSR), Left Stress Rule (LSR), V/VC Stress Rule (VSR), and Prefix Stress Rule (PSR). In order to apply these rules, participants learnt how to identify parts of speech, affixes, syllable structure, and stressed/unstressed syllables. They focused on identifying the Key Syllable (positioned at the end of a word or left of an ending) and the Left Syllable (positioned to the left of the Key Syllable), either of which is always the main stress-carrier in the rule patterns presented in Table 1.

Table 1

Characteristics of KSR, LSR, VSR, and PSR Stress-Rule Patterns

Pattern	Word endings	Rule	Examples [a]
Key Stress Rule (KSR)	Key Rule Endings: *-ia* (+V/C) *-io* (+ V/C) *-iu* (+ V/C) *-ienC*	Stress Key Syllable.	*rem**ed**(ial* *fall**ac**(ious* *cons**ort**(ium* *conv**en**(ienc(e*
	Other endings that follow Key Rule Endings: *-er, -ive* *-al, -able, -ate* *-y, -ary, -ory* *-ize/ise, -ist, -ism* *-alise/alize, -alist, -alism*		*exec**ut**(ioner* *devi**at**(ional* *conc**il**(iatory* *cre**at**(ionism* *r**at**(ionalism*
Left Stress Rule (LSR)	*-y, -ies* (plural ending) *-fy, -fies, -fied,-fier, -fying* [b] *-ate, -ated, -ating,* *-ator* *-acy, -acies*	Stress Left Syllable.	*homogen**e**it(y* *common**al**it(ies* ***fort**if(ied* *inc**in**er(ate* *p**erp**etr(ator* *deg**en**er(acy*

Pattern	Word endings	Rule	Examples [a]
V/VC Stress Rule (VSR)	*-al* (adj. only) *-ous* (adj.) *-ant* (adj. & n.) *-ance* (n.) *-ancy* (n.) *-ent* (adj. & n.) *-ence* (n.) *-ency* (n.) *-ic* [c] (adj. & n.)	1. Stress Left Syllable if Key Syllable is spelled with a V or VC. 2. Stress Key Syllable if spelled otherwise.	*in**aug**ur(al* ***om**in(ous* *c**ompl**im(ent* *c**omp**et(**ency* *photogr**aph**ic* [c] *cub**oid**(al* *dis**astr**(ous* *adol**esc**(ent* *acc**ount**(ancy*
Prefix Stress Rule (PSR)	*-ary* *-ery* *-ory* *-ive* *-ative* *-atory* *-ature*	1. Stress Left Syllable if the prefix [d] is not part of the Left Syllable. 2. Stress Key Syllable if otherwise.	***arb**itr(ary* *inqu**is**it(ive* *c**ar**ic(ature* *inf**irm**(ary* *obj**ect**(ive* *cons**erv**(atory*

[a] The underlined syllable is the Key Syllable and the stressed syllable is in bold.
[b] The *-f-* in *certifies/certified* is not part of the left rule ending, but it helps identify the set of words to which the LSR applies.
[c] The VSR rule also applies to adjectives and nouns with a final *-ic*. Here, however, the final *-ic* is the Key Syllable not an ending, which is why there is no open parenthesis to mark the rule ending as in the examples *photogr**aph**ic* (adj.) and *econ**om**ics* (n.). Note that *-s* in *economics* is considered a neutral ending.
[d] Neutral prefixes are ignored when analysing words: *counter-/contra-, inter-/intro-, extra-, over-, retro-, super-*. Regular prefixes are relevant in the Left Syllable: *de-, re-, pre-, pro-, per-, ad-, ab-, ob-, sub-, in-, com-, con-, ex-, dis-*.

The teaching intervention also included training in strategy use. As a reference point for the PLS classification, we used the Prediction, Perception, Production (3Ps) Model (Dickerson, 2013) which emphasises the connection between orthography and prediction, thus facilitating perception and production. Once learners were equipped with predictive stress rule patterns, they could rely on orthography in covert rehearsal to practise and monitor their performance. They also used learning strategies to guide them when completing homework assignments (see Table 2). The intervention was conducted as eight 45-minute sessions over a four-week period. Lesson 1 introduced participants to the CRM, the PLSs, how to keep a strategy diary, and how to use online tools as speech models. Lessons 2–8 focused on syllable structure, identifying the Key and Left Syllables, and the four word-stress rules. Throughout the intervention, all participants in the treatment group attended lessons regularly, practised in class and at home, and completed seven homework assignments. The instructor gave explicit instructions about word-stress rules, suggested additional resources for the practice of the rules, provided opportunities for practice in/out of class, and supervised students' homework. They all kept a diary about their strategy use after each homework assignment. To facilitate their diary entry writing, they were given a list of questions as prompts and instructed to write either in their mother tongue or in English. They were required to send each diary entry to the course instructor who provided assistance when necessary.

Table 2

Pronunciation Learning Strategies

Strategy type	Code	Description
Prediction strategies	PRE1	I analyse the spelling to identify the syllables in a word.
	PRE2	I analyse word endings to identify the Key and Left Syllable in a word.
	PRE3	I use word endings to decide which syllable to stress in a word.
Production strategies	PRO4	I record myself saying polysyllabic words and then compare my own production against that of the model.
	PRO5	I listen to speech models and imitate their pronunciation of a word.
	PRO6	I read aloud a word several times and pay attention to which syllable is the loudest.
	PRO7	I read aloud sentences/passages with the target word.
	PRO8	I use the target word in a sentence.
Perception strategies	PER9	I listen to speech models (online tools/recorded material/native speakers).
	PER10	I listen to recorded material to identify the stressed syllables in words.
	PER11	I highlight or underline the stressed syllable in a word.

3.4 Data collection and analysis

This study uses a mixed-method design. For the quantitative part of the data, the participants completed pre-, post- and delayed post-tests. The test consisted of 20 target words, 5 per each stress rule and 11 distractors (see Appendix). Using the same test words in a shuffled order for all three tests allowed for a more objective measure of participants' progress over time. They were recorded saying each word aloud using the audio recording software Audacity[1]. The pre-test (T1) was conducted before the intervention, with a post-test (T2) after the intervention in week five, and a delayed post-test (T3) three weeks after the post-test. A total of 2400 tokens were analysed for accurate stress placement (1200 words per group). The benchmark against which the participants' pronunciation of the target words were assessed was the Cambridge Online Dictionary[2], i.e., the dictionary's audio recordings of the same stimuli words. Care was taken that the stimuli words had identical stress patterns in both British and American varieties. All tokens were marked by the instructor – value 1 was given for correct stress placement and value 0 for incorrect stress placement. The 0 category also included mispronounced words, e.g., **disorientantive* for *disorientate*, or truncation of syllables, e.g., **delination* for *delineation*.

A series of two-way mixed ANOVAs were performed to test the main effect of TIME (pre-test T1 vs. post-test T2 vs. delayed post-test T3) and GROUP (treatment vs. control), as well as their interaction effect (TIME x GROUP) on stress patterns (combined scores, as well as separate scores for KSR, VSR, LSR, and PSR). A follow-up one-way repeated measures ANOVA was applied to analyse differences in stress patterns as measured at T1, T2 and T3 among participants in the treatment and the control group separately. In all analyses, Mauchly's

[1] Audacity https://www.audacityteam.org/
[2] Cambridge Dictionary [Online] https://dictionary.cambridge.org/

test of sphericity was non-significant, implying that the assumption for using mixed ANOVA was met; therefore, mixed ANOVA and follow-up one-way repeated measures ANOVA could be applied. The Box's test of equality of covariance matrices was also not significant, indicating that the covariance matrices are equal. In addition, a *t*-test was used to analyse if there were differences in pre-test scores (baseline measures) on all stress patterns between the treatment and the control group; the results were not significant, indicating that the two groups did not differ at T1 (see §3.2).

As qualitative data, the participants' diaries were analysed to gain insight into their strategy use and to stimulate reflection on learning processes during assignment completion and private practice (Goh, 1997; Pawlak & Szyszka, 2018). Each participant from the treatment group completed seven diary entries, which were first analysed for the type of strategy used (identified using the strategy descriptions 1–11 in Table 2), and then the total number of responses for each reported strategy per participant was counted.

4 Results

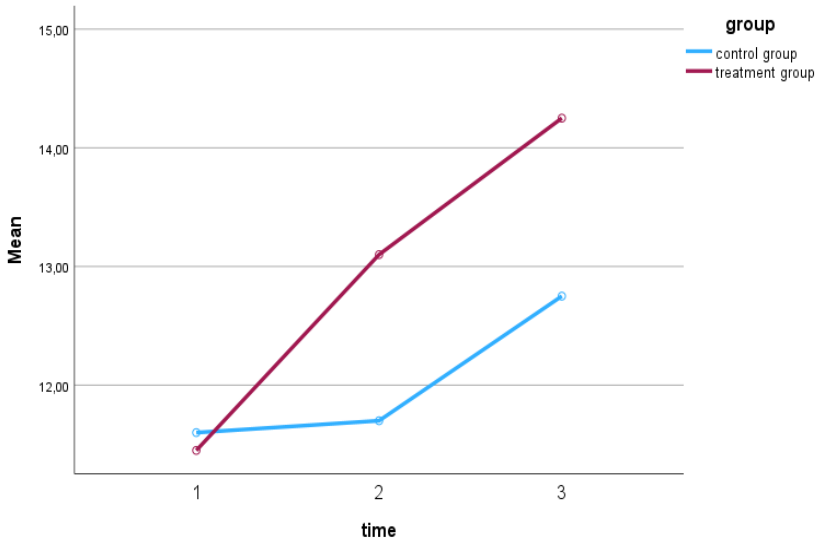
4.1 Effects of instruction

To test whether the treatment, i.e., the teaching intervention, yielded improvement of word-stress rules instruction in the participants' production of test words, subject variation from T1–T2 and from T1–T3 was calculated using a series of two-way mixed ANOVAs. The scores from all test words for all four stress rule patterns were combined and analysed to check for the effectiveness of the instruction as a whole. The scores from test words were further grouped by stress rule pattern (KSR, LSR, VSR, PSR) and analysed separately to check which pattern demonstrated best results.

The results for the overall instruction with combined scores for all stress rule patterns indicated no significant main effect of GROUP (treatment vs. control), $F(1, 38) = 0.99$, $p = .325$, $\eta^2 = .02$. However, they did indicate a significant main effect of TIME (T1, T2, T3) $F(2, 37) = 21.71$, $p = .00$, $\eta^2 = .54$, as well as a statistically significant interaction of TIME and GROUP $F(2, 37) = 4.04$, $p = .026$, $\eta^2 = .18$. Hence, while the two groups did not differ significantly because improvement was evident in both groups over time, the treatment group demonstrated greater improvement consistently from T1 to T3 compared to the control group (Figure 1, Table 3).

Figure 1

Treatment vs. Control Group: Overall Improvement



Note. TG n = 20; CG n = 20.

Table 3

Mean and Standard Deviation Values for the Treatment and Control Groups at T1, T2 and T3

Group	T1_all		T2_all		T3_all	
	M	SD	M	SD	M	SD
Treatment	11.4500	2.28208	13.1000	3.00701	14.2500	2.86310
Control	11.6000	3.15228	11.7000	3.98814	12.7500	3.16020

Note. TG n = 20; CG n = 20; all = combined accuracy scores of read-aloud polysyllabic words (KSR, VSR, LSR, and PSR).

A follow-up one-way repeated measures ANOVA revealed significant differences in mean scores across testing times for the treatment group ($F(2, 18) = 21.98$, $p = .000$, $\eta^2 = .71$) indicating that these participants demonstrated differences regarding the time they were tested. Pairwise comparisons based on Bonferroni adjustment at three testing times revealed that participants' test scores at T2 were significantly higher than T1 scores ($M_{T2} = 13.1$ vs. $M_{T1} = 11.45$; $p < 0.01$). Moreover, T3 scores were significantly higher than both T1 scores ($M_{T3} = 14.25$ vs. $M_{T1} = 11.45$; $p < 0.001$) and T2 scores ($M_{T3} = 14.25$ vs. $M_{T2} = 13.1$; $p < 0.05$), suggesting that participants' improvement was steady over time and their knowledge of word-stress rules was retained.

Significant differences in mean scores across testing times were registered for the control group as well ($F(2, 18) = 4.29$, $p = .030$, $\eta^2 = .32$). Pairwise comparisons at three testing times showed that the difference in participants' test scores at T3 in comparison to their test scores at T1 was significant ($M_{T3} = 12.75$ vs. $M_{T1} = 11.60$; $p < 0.05$), while no statistically significant

differences in the test scores at T1 vs. T2 (M_{T1} = 11.60 vs. M_{T2} = 11.70), and T2 vs. T3 (M_{T2} = 11.70 vs. M_{T3} = 12.75) were found.

To see which rule pattern was most successfully applied after the teaching intervention, participants' score variation was calculated for each stress rule category separately. Table 4 shows that participants' initial proficiency performance in the treatment and the control group was similar for all four categories, i.e., for KSR ($t(38) = 0.78$, $p > 0.05$; M_{TG} = 2.6 vs. M_{CG} = 2.4),VSR ($t(38) = -0.74$, $p > 0.05$; M_{TG} = 3.15 vs. M_{CG} = 3.4), LSR ($t(38)= -0.19$, $p > 0.05$; M_{TG} = 2.85 vs. M_{CG} = 2.9), and PCR ($t(38) = -0.78$, $p > 0.05$; M_{TG} = 2.8 vs. M_{CG} = 2.9).

The analyses of KSR, LSR, and VSR scores revealed a similar trend for these three stress rules (Figure 2, Table 4). The results for the KSR pattern indicated no significant main effect of GROUP, $F(1, 38) = 2.42$, $p = .128$, $\eta^2 = .02$, a significant main effect of TIME, $F(2, 37) = 4.21$, $p = .023$, $\eta^2 = .18$, and no statistically significant interaction of TIME and GROUP, $F(2, 37) = 1.01$, $p = .376$, $\eta^2 = .05$. The results for the LSR pattern indicated no significant main effect of GROUP, $F(1, 38) = 0.89$, $p = .351$, $\eta^2 = .02$, a significant main effect of TIME, $F(2, 37) = 10.92$, $p = .000$, $\eta^2 = .37$, and no statistically significant interaction of TIME and GROUP, $F(2, 37) = 1.86$, $p = .171$, $\eta^2 = .09$. The results for the VSR pattern indicated no significant main effect of GROUP, $F(1, 38) = 1.03$, $p = .317$, , $\eta^2 = .03$, a significant main effect of TIME, $F(2, 37) = 4.40$, $p = .019$, $\eta^2 = .19$, and no statistically significant interaction of TIME and GROUP, $F(2, 37) = .51$, $p = .606$, $\eta^2 = .03$. According to these results, both groups showed similar improvement from T1 to T3 (see Table 4); however, this improvement is not substantial enough to be attributed to the teaching intervention.

The results for the PSR pattern indicated no significant main effect (borderline) of GROUP, $F(1, 38) = 3.88$, $p = .056$, $\eta^2 = .02$, but a significant main effect of TIME, $F(2, 37) = 7.79$, $p = .002$, $\eta^2 = .30$, as well as a statistically significant interaction effect of TIME and GROUP, $F(2, 37) = 6.01$, $p = .005$, $\eta^2 = .25$. Such a trend for the PSR pattern can be observed in Figure 2. The results for the control group are similar at each testing time showing modest improvement, while the results for the treatment group demonstrate noticeable improvement from T1 to T3, indicating that the instruction was effective for this stress rule pattern.

Table 4

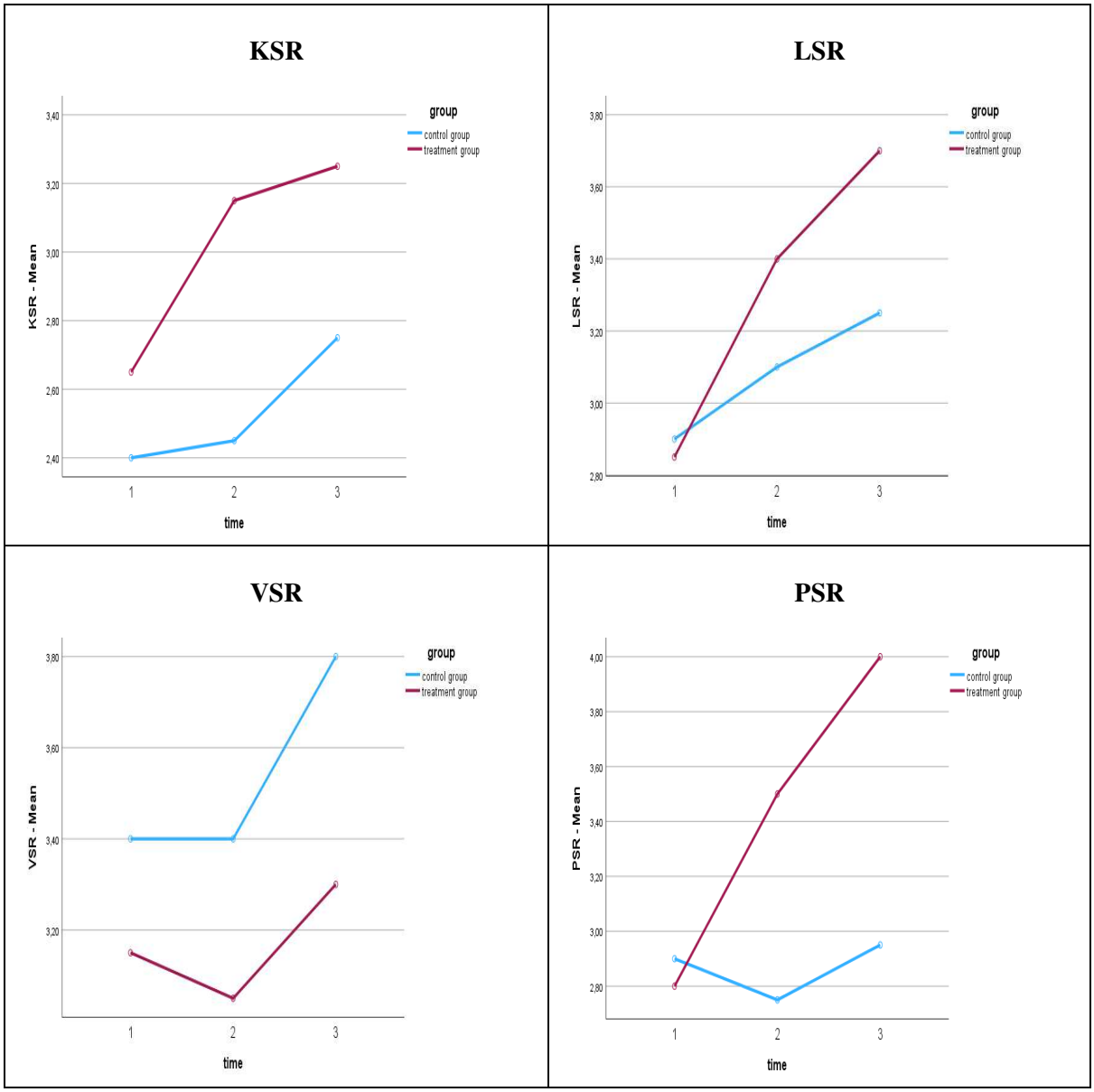
Mean and Standard Deviation Values for the Treatment and Control Groups at T1, T2, and T3 for KSR, LSR, VSR, and PSR

Group		KSR		LSR		VSR		PSR	
		M	SD	M	SD	M	SD	M	SD
Treatment	T1	2.6500	1.03999	2.8500	0.81273	3.1500	0.87509	2.8000	0.95145
	T2	3.1500	0.98809	3.4000	0.94032	3.0500	1.23438	3.5000	1.14708
	T3	3.2500	1.20852	3.7000	1.03110	3.3000	0.97872	4.0000	0.91766
Control	T1	2.4000	0.99472	2.9000	0.85224	3.4000	1.23117	2.9000	1.29371
	T2	2.4500	1.39454	3.1000	0.96791	3.4000	1.66702	2.7500	1.25132
	T3	2.7500	1.06992	3.2500	0.85070	3.8000	1.39925	2.9500	0.99868

Note. TG n = 20; CG n = 20.

Figure 2

Treatment vs. Control Group Progress for KSR, LSR, VSR, and PSR Stress-rule Patterns



Note. TG n = 20; CG n = 20.

4.2 Use of pronunciation learning strategies

Data from participants' diary entries was coded and analysed to identify which strategies were used during completion of homework assignments 1–7. The results in Table 5 show that all suggested strategies were used, with different combinations of strategy categories. The participants most frequently used prediction strategies either to identify syllables (PRE1 = 18), to analyse word endings for Key/Left Syllable identification (PRE2 = 59), or to use word endings to decide which syllable to stress (PRE3 = 46). Three out of five production strategies were also frequently used: the participants were recording themselves saying polysyllabic words and comparing their production against a model (PRO4 = 49); just listening to speech

models and imitating their pronunciation of the word (PRO5 = 36); or reading aloud a word and paying attention to the loudest syllable (PRO6 = 21). The remaining two production strategies were hardly ever used, i.e., participants did not choose to practise reading aloud sentences/passages with the target word (PRO7 = 4), or using the target word in a sentence (PRO8 = 2). The perception strategies were sporadically used compared to prediction and production strategies; when used, they included listening to speech models such as recordings of native speakers (PER9 = 18), listening to recordings to identify the stressed syllable (PER10 = 4), or highlighting/underlining the stressed syllable in a word (PER11 = 8).

Comparing the number of strategies reported in a single assignment, fewer strategies were used for homework 1–2, which focused on identification of syllable structure and Key/Left Syllable. The number of strategies used increased for homework 3–7, which focused on the four stress-placement rules, indicating that participants chose to apply the rules practised in class, and that during covert practice they experimented with a combination of strategies from all three categories.

Table 5

Frequency Count of Reported Pronunciation Learning Strategies

PLSs	Hw1		Hw2		Hw3		Hw4		Hw5		Hw6		Hw7		Total per PLS
	n	%	n	%	n	%	N	%	n	%	n	%	n	%	
PRE1	11	55	1	5	1	5	-	-	1	5	2	10	2	10	18
PRE2	-	-	14	70	13	65	6	30	12	60	6	30	8	40	59
PRE3	-	-	1	5	7	35	8	40	11	55	9	45	10	50	46
PRO4	7	35	-	-	8	40	10	50	8	40	8	40	8	40	49
PRO5	6	30	-	-	3	15	6	30	7	35	7	35	7	35	36
PRO6	5	25	1	5	2	10	4	20	3	15	2	10	4	20	21
PRO7	-	-	-	-	1	5	1	5	2	10	-	-	-	-	4
PRO8	-	-	-	-	-	-	2	10	-	-	-	-	-	-	2
PER9	2	10	-	-	2	10	2	10	4	20	5	25	3	15	18
PER10	-	-	-	-	3	15	-	-	-	-	-	-	1	5	4
PER11	1	5	1	5	1	5	2	10	-	-	1	5	2	10	8
Total per Hw	32		18		41		41		48		40		45		

Note. TG *n* = 20; PRE = prediction, PRO = production, PER = perception, Hw1–7 = homework 1–7.

5 Discussion

The first research question focused on whether instruction under the CRM for a short treatment period improved learners' word stress placement in polysyllabic words. It also addressed which stress rule pattern was most effectively learnt. Our findings revealed that although the treatment and the control group did not differ (the main effect of GROUP was statistically insignificant), the treatment group achieved better scores over time (the main effect of TIME was statistically significant as well as the interaction of TIME and GROUP). These results may indicate that the participants who received instruction tend to demonstrate enhanced ability to accurately

stress polysyllabic words compared to the participants who did not receive instruction. A possible explanation about the improvement demonstrated by the participants in the control group might be that during the treatment period they attended other English classes specialised in linguistics and literature, hence, such regular language exposure may have affected their progress from T1 to T3 positively. At the same time, the participants in the treatment group also attended the same classes and were exposed to the same language input. This might mean that for them the teaching intervention seems to make a difference on its own, because their improvement in comparison to the participants in the control group was noticeable over time (from T1 to T2 to T3). In addition, the separate analyses by stress rule pattern showed that the effect of instruction was indicative for KSR, LSR, VSR, and particularly evident for PSR. Learners appear to have benefited from orthographic rules for stress placement, which concurs with Sardegna and Dickerson (2023). The improvement of the treatment group was moderate but steady over testing times, so we may infer that the length of the intervention was too short. Nonetheless, even a short explicit teaching intervention of a particular pronunciation feature, such as word stress, might also prompt learners' awareness of that feature. As for the learnability of stress rule patterns, our results indicated that some rules seem easier to grasp (PSR) than others (KSR, LSR, VSR); although statistically insignificant, the results for KSR, LSR, and VSR appeared to indicate improvement, implying that the teaching intervention for these rules may have been helpful.

The second research question addressed the types of strategies used by learners during self-practice. The results indicated that learners, once trained how to employ strategies to their advantage, chose to combine them to complete assigned tasks. The two most commonly reported strategies were prediction strategies PRE2 and PRE3, i.e., the learners relied on analysing word endings to find the stressed syllable. This provides further support to the claim that, when orthographic stress-placement rules are practised, prediction facilitates learning. Strategy use seems to complement consolidation of knowledge acquired through explicit rule instruction and to help the learning process in general, which is consistent with results from research into strategy use (Ingels, 2011; Nakatani, 2005; Szyszka 2021).

The teaching intervention participants received was fully integrated in the course Modern English 2, which was mandatory in their curriculum. This aspect is relevant, as it shows that such integration is achievable and successful. Furthermore, time restrictions (often considered a major drawback for pronunciation instruction) can be overcome. It further supports the need for regular practice over time, for pronunciation rules to be internalised.

Effective application of rules and strategies has important implications for pronunciation pedagogy. The results of this study suggest that word-stress rules show great potential for integration into ESL/EFL teaching syllabi. Learners need explicit rules; hence, suggesting online resources for self-monitoring their performance, such as online dictionaries, speech models (e.g., Youglish, TED talks)[3] and voice recorders (e.g., Vocaroo, Voice spice)[4] might strengthen their motivation and willingness to improve. Given that learning strategies reinforce self-regulated practice (Pawlak & Oxford, 2018), teachers could select strategies to suit their learners' needs, provide training with those strategies, and monitor learners' progress with strategy diaries.

[3] YouGlish https://youglish.com/
TED talks https://www.ted.com/talks
[4] Vocaroo https://vocaroo.com/
Voice spice https://voicespice.com/

6 Conclusion

The aim of this study was to examine whether a short-period teaching intervention consisting of orthographic word-stress rules and pronunciation learning strategies under the CRM could help learners improve their word stress placement accuracy. It also took into consideration the learner profile (shared L1) and context (EFL classroom setting, integrated instruction in a general English language course). The results suggest that such instruction is beneficial for learners over time, as measured by a read-aloud task. The combination of rules and strategies tends to improve learners' ability to recognise and understand novel pronunciation structures, and, therefore, increases learner autonomy for self-practice outside the classroom.

Future research could investigate whether such combined rule and strategy instruction translates into improvement in word stress placement accuracy in spontaneous speech. Further research into the link between word stress placement and vowel quality change (for instance, nuances such as correct stress/correct vowel, or correct stress/incorrect vowel) is needed to better understand the acquisition process of word stress. From a methodological point of view, future studies might consider a larger participant sample to obtain more generalisable results, including a comparison group with implicit instruction, and finding ways of controlling for parallel language input.

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Appendix

Test Words (n = 20) and Distractors (n = 11)

Rule pattern	Test words	Word endings
KSR	rep**ud**iate	-iaC
	deline**at**ion	-ioC
	cons**ort**ium	-iuC
	dis**or**ientate	-ienC +nonbasic ending
	d**ev**iance	-ianC
VSR	anc**estr**al	-al
	stup**end**ous	-ous
	econ**om**ics	-ic = Key syllable
	adol**esc**ent	-ant/ent
	extr**av**agancy	-ancy/ency

Rule pattern	Test words	Word endings
LSR	heterogen**e**ity	-y
	incr**im**inate	-ate
	appr**ox**imate	-ate
	obstinacy	-acy
	in**acc**uracy	-acy
PRS	**arb**itrary	-ary
	savagery	-ery
	exp**os**itory	-ory
	ind**ic**ative	-ive
	impl**ic**ature	-ature
Distractors		
reading, matched, ended, fighting, sniffing, acted, breaking, seemed, blaming, running, glued		

Note. C = consonant letter.

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