# On the Teachability of Stress Patterns:

# A Mixed-Methods Randomised Controlled Trial

Mark Harris

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**On the Teachability of Stress Patterns:**
**A Mixed-Methods Randomised Controlled Trial**

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Department of Education
University of Oxford
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19,959 words

Dissertation submitted in part-fulfilment of the requirements for the degree of
Master of Science in Applied Linguistics for Language Teaching

Trinity Term 2025

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**Acknowledgements**

I would like to thank Dr. Anna-Maria Ramezanzadeh for her support and guidance throughout the writing of this thesis. I was a fortunate beneficiary of her knowledge and experience. I hope the imperfections in this study do not let her down.

I would be amiss not to mention and give thanks to the following for their support: Elvira Vasileva, Russell Harris, Patricia Harris, Lam Ka Ho, and Heath Rose. During induction week for this course, I recall meeting Professor Rose and discussing some setbacks I had had attempting to publish a previous thesis. His kind words of encouragement have made a lasting impression that, if at first you do not succeed, it is worthwhile to persist.

I would like to give anonymous acknowledgement and appreciation for the sense of purpose and happiness that many students have brought me in recent years, especially those who have been English Ambassadors. The learning I do is for the benefit of you, and I hope my well wishes for your future do not need to be stated.

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## List of Abbreviations

| | |
|---|---|
| ANOVA | Analysis of Variance |
| CONSORT | Consolidated Standards of Reporting Trials |
| CUREC | Central University Research Ethics Committee |
| EDB | Education Bureau |
| EFL | English as a Foreign Language |
| EIL | English as an International Language |
| ELF | English as a Lingua Franca |
| ESL | English as a Second Language |
| $H_0$ | Null hypothesis |
| $H_1$ | Alternative hypothesis |
| IPA | International Phonetic Alphabet |
| L1 | First Language |
| L2 | Second Language |
| MOI | Medium of Instruction |
| NNS | Non-Native Speaker |
| NS | Native-speaker |
| PEPS-C | Profiling Elements of Prosody in Speech Communication |
| RCT | Randomised Controlled Trial |
| RQ | Research Question |

# Abstract

The teachability of word stress and stress-timed rhythmic patterns for L2 English learners is a debated topic in applied linguistics. While some researchers question the reliance on L1 English-speaker intuitions for designing pronunciation syllabi, others argue that teaching stress patterns enhances L2 intelligibility and phonological development. This mixed-methods study investigates the impact of a stress pattern intervention on adolescent L2 learners in Hong Kong, focusing on stress perception and production. Employing a pre-, post-, and delayed post-test design, the study uses tailored instruments to measure stress pattern recognition and production, supplemented by surveys and interviews to explore learners' attitudes. Data analysed with SPSS version 29 reveals a large short-term intervention effect for stress perception that approaches statistical significance $(d = .83, p = .055)$, and a significant correlation between initial prosodic skills and post-intervention outcomes $(.801 \leq R \leq .890, p < .001)$. Hong Kong adolescent attitudes towards learning stress patterns are, further, found to be positive, despite evidence of placing more value on examination skills. These findings suggest that explicit stress pattern instruction may support L2 phonological development, particularly in perception, despite insufficient statistical significance.

# 1. Introduction

The teachability of word stress and stress-timed rhythmic patterns as prosodic features of English speech for L2 learners has been a debated topic in applied linguistics (Cauldwell, 1996; Dalton & Seidlhofer, 1994; Jenkins, 2002). ELF[1] researchers have questioned L1 English-speaker intuitions for designing pronunciation syllabi that encourage L2 English-speaker awareness of L1 English-speaker stress patterns (Jenkins, 2000, 2002), while alternative voices have argued that the teaching of word stress aids intelligibility and phonological development for L2 acquisition (Ingram, 2005; Lewis & Deterding, 2018; Setter & Sebina, 2017). Taking into consideration the sometimes overlooked utility of learning stress patterns for L2 oracy and performance scenarios (Language Policy Programme, 2020; Lee, 2016), there is a need for educators in speech training roles to understand the teachability of stress patterns for speech production (Levelt, 1993).

Treating the above two perspectives as hypotheses for the teachability of stress patterns, this mixed methods experiment investigates the effect of a stress pattern intervention on the development of stress perception and production for adolescent learners in Hong Kong. The study uses a pre-, post-, delayed post-test design that incorporates tailored instruments to measure stress pattern recognition and production. It further surveys participants to correlate test outcomes to background variables, and harnesses surveys and interviews to conceptualise Hong Kong adolescents' attitudes and beliefs towards learning English stress patterns. The measured outcomes are tested for statistical significance and effect size using SPSS version 29, and the data analysis results are then discussed in relation to the research questions.

The study finds limited statistically significant findings. The experimental intervention indicates a moderate-to-large effect size for the perception of stress patterns, although this result only approaches statistical significance. The study also finds a statistically significant large correlation between initial prosodic skills and post-intervention stress pattern abilities.

[1] ELF here refers to contexts where English is spoken ubiquitously as an L2.

# 2. Literature Review

## 2.1. Introduction

This literature review will evaluate perspectives on the teachability of stress patterns for accurate perception and production and its relationship to the performative production of stress-timed rhythm. It will further review literature into learner perceptions of learning stress patterns in L2 English learning contexts.

## 2.2. Definition of Terms

For the purposes of this study, the stress patterns focused on will be related to word stress and stress-timed rhythm. While there is the potential to research the teachability of sentence stress and the use of nuclear stress for developing intonation (Roach, 2009; Underhill, 2005), it is word stress and stress-timed rhythm, as types of stress pattern, that have been questioned for their teachability (Jenkins, 2002).

### 2.2.1. Word Stress

The term word stress, also known as lexical stress, refers to the accent of emphasis given to a syllable within a word according to its length, volume, height of pitch, clarity of articulation, and the energy of movement in a speaker's face and vocal tract (Celce-Murcia et al., 1996; Underhill, 2005). Following English syllable structure, a morpheme can have the property of a stressed vowel or an unstressed vowel sound (Roach, 2009). In words with at least two-syllables, a stressed syllable is that which has a stressed vowel sound (Celce-Murcia et al., 1996). Multi-syllabic words can have more than one stressed syllable (Roach, 2009). Celce-Murcia et al. (1996) characterises the levels of syllable stress within a multi-syllabic word as being either strongly stressed, lightly stressed, or unstressed; Roach (2009) and Underhill (2005) term these levels of stress as primary stress, for strongly stressed syllables, and secondary stress, for

lightly stressed syllables. The determination of where stress falls in an English word can depend on its etymology, affixation, or grammatical function within an utterance (Celce-Murcia et al., 1996).

### 2.2.2. Stress-Timed Rhythm

Stress-timed rhythm refers to the regular, patterned beat of stressed and unstressed syllables in an utterance (Celce-Murcia et al., 1996). According to the stress-timing hypothesis, stress-timed rhythm is an essential feature of the English language for L1 English-speakers and provides a basis for metrical feet in English poetry, chants, nursery rhymes, and limericks (Cauldwell, 1996; Celce-Murcia et al., 1996). The hypothesis posits that the stressed beats of an utterance occur at approximately even intervals throughout it. Noting that pauses or unstressed syllables can occur between the stressed beat, Roach (2009, p. 107) gives the following example:

1 2 3 4 5
| ˈWalk | ˈdown the | ˈpath to the | ˈend of the ca | ˈnal. |

Here, the utterance is broken into metrical feet, with each foot beginning with a stressed syllable and continuing with unstressed syllables until the start of the next foot. The validity of the stress-timing theory has been questioned on the grounds of contradictory evidence of natural speech analyses (Dauer, 1983; Jenkins, 2002). However, stress-timed rhythm can be constructed with strict metrical feet in poetic texts and performances (Cable, 2001; Crystal, 2017).

## 2.3. The Significance of Teaching Stress Patterns

The significance of stress patterns for L2 English pronunciation is a point of controversy among applied linguists. Proponents of World Englishes view the traditional emphasis on NS prosody implied in stress pattern instruction as an

unnecessary and inhibitive limitation on communicative development that attempts to conserve unrealistic NS standards without appreciation for L2 English-speaker varieties of English (Jenkins, 2002; Jenkins et al., 2018). In the context of globalisation, ELF researchers would prefer for L1 stress patterns to be transposed onto English speech, and thereby enable intercultural communication through intelligible interactions, rather than limit communication through a concern for stress accuracy. Crystal (2017), meanwhile, has stated that the rhythm of stress patterns is the most significant feature of English speech for explaining individual uses of pronunciation. Giving a humanistic perspective on the importance of stress patterns, he argues that understanding and managing rhythmic change correlates with shifts in emotions and subject matter. From this perspective, understanding others and expressing oneself with a broad range of emotions can depend on learning how to manage stress patterns.

Considering pronunciation taught for specific communicative contexts, Pennington (2021) makes the case that in school and university settings pronunciation may not be featured on the main language syllabus but introduced on an as-need basis to support learner performance. As pronunciation is often taught as a subsidiary skill to achieve spoken language goals in communicative language teaching and task-based instruction, the demands of the communicative task can determine the significance of teaching the pronunciation skill. While ELF researchers often contextualise pronunciation needs and the value of pronunciation skills for intelligibility in the contexts of academia or international business for intercultural communication (Jenkins et al., 2018), Pennington's (2021) proposal attributes potential importance to pronunciation skills in scenarios that require L2 oracy, such as oral examinations, dramatic performances, or speech recitals. This is consistent with the latest CEFR guide that encourages L2 oracy for public announcements (Language Policy Programme, 2020). In the context of Hong Kong, furthermore, the annual Hong Kong English Speech Festival requires school students to demonstrate competence with prosodic features of speech for public performance (Hong Kong Schools Music and Speech Association, 2025; Lee, 2016). For educators responsible for training students for these scenarios, there is a need to understand whether and how stress patterns can be taught.

## 2.4. $H_0$: Stress Patterns Cannot Be Taught

In her EIL pronunciation syllabus, Jenkins (2002, p. 99) makes the claim that word stress is an "unteachable" phonological skill for NNS of English. From a postpositivist perspective, Jenkins (2002) claim can be considered a $H_0$ for the teachability of word stress. She reasons that rules for word stress in English are too complex for learners to be successfully taught. One sociolinguistic principle underpinning her argument is the significance of intelligibility for communication between English speakers with different L1 backgrounds (Jenkins, 2000, 2002). Given the use of ELF in global contexts, she reasons that L2 English phonology curricula should prioritise features of speech that enable interpersonal communication, regardless of L1 variation, and avoid prioritising instruction in complex features of speech, such as word stress, that are liable to reduce communicative competence.

The argument that stress patterns cannot be taught also emanates from the belief that the notion of stress-timed languages is an unfounded hypothesis (Cauldwell, 1996; Dalton & Seidlhofer, 1994; Jenkins, 2002). Defining stress-timed languages, Pike (1946) and Abercrombie (1967) argue that stress-timed languages, such as English and Russian, are isochronous and, therefore, stress syllables at approximately even time-intervals. They contrast stress-timed languages with syllable-timed languages, such as French and Cantonese, which stress syllables at identical time-intervals and seem to have uniform duration of stressed syllables (Abercrombie, 1967; Pike, 1946). Whereas stress-timed languages create a pulse-like rhythm through stressed and unstressed beats, syllable-timed languages create rhythm through a steady and consistent series of stressed beats.

Testing the hypothesis through a comparison of syllable lengths in different languages, Dauer (1983) falsified the strict notion of syllable- and stress-timed languages. Instead, she argued that there is substantial variation in each language's stress patterns depending on syllable structure, vowel reduction, and phonetic realisation of stress.

She proposed a continuum of rhythmic timings, with stress-timed and syllable-timed languages being theoretical end-points on the continuum. According to the evidence of Dauer (1983), languages have a common tendency to reduce the vowels of unstressed syllables, including syllable-timed languages such as Spanish. Languages that orientate towards stress-timing optimise the changes between stressed and unstressed syllables, whereas languages that orientate towards syllable-timing minimise the changes.

Addressing the debate over the stress-timing hypothesis through a narrative review, Cauldwell (1996) argues that speakers are agentive for timing languages, and it is a misconception to believe that languages give rhythmic timing to speakers. He found that arguments for stress-timed languages have inconsistent concepts of rhythm and treat speech as a product for analysis, rather than focusing on the meaning of the utterance. While Cauldwell (1996) rebuts the idea that stress-timing is an underlying feature of spoken English, his analysis leaves open room for the utility of stress-timing in the performance of language recitals.

### 2.5. $H_1$: Stress Patterns Are Teachable

Exploring the autobiographies of 30 exceptional language learners, Dörnyei and Mentzelopoulos (2022) propose an $H_1$ that stress patterns, as a feature of nativelike pronunciation, are teachable for L2 speakers. Noting the unexpected frequency with which exceptional language learners focus their attention on pronunciation, Dörnyei and Mentzelopoulos (2022) suggest that nativelike stress patterns can be acquired through incidental learning, conscious mimicry, or imitating role models. They, further, make three points against the view that stress patterns are unteachable. First, they argue that contemporary language teaching often fails to attach significance to teaching pronunciation, which frames learner perceptions of what their learning goals should be. Second, they argue that a late-20$^{th}$ century trend towards communicative language teaching in professional teacher training has shifted learning focus away from accuracy towards communicative competence. This shift has risked neglecting

learners' pronunciation-related learning objectives. Third, they argue that academic disputes over what language model to study, such as ELF opposition to standard forms of English, has often shifted pedagogical attention away from nativelike learning goals. This, hypothetically, could have resulted in unrealised learning potential for L2 students.

### 2.5.1. How Can Stress Patterns Be Taught?

Educator-researchers and material developers have generated numerous learning strategies for supporting L2 learners to practice and develop stress patterns (Derwing et al., 2022; Loewen & Sato, 2017). One technique for recognising word stress is to visualise stress placement with abstract symbols, such as using oOoo to illustrate the stress pattern for 'eternity' (/ɪˈtɜːnəti/), or alternatively underlining the stressed syllable, as in 'eternity' (Dalton & Seidlhofer, 1994; Roach, 2009). Hancock (1995) has developed notable pronunciation games, or puzzles, that necessitate learners to cognise the placement of stress within a word or utterance to solve the activity. For training receptive skills related to word stress, Celce-Murcia et al. (1996) recommend listening discrimination activities that focus learner attention on the placement of stress within a word or utterance, such as discriminating between the stress in /ˈprɛzᵊnt/ and /prɪˈzɛnt/. For managing stress production, Underhill (2005) recommends students to utter words in repetition with variations of the stress placement, such as saying [ˈɪnsɜːt ɪnˈsɜːt] in repetition. He further recommends raising awareness of unstressed syllables through repeating a word or utterance with speed variations, so that the reduced vowel quality of the unstressed syllables can be detected. For training stress-timed rhythm, Dalton and Seidlhofer (1994) recommend reducing an utterance to one phoneme with alternating beats, such as exhaling /s/ as [sSsSsSsS], and comparing this rhythm to an authentic line of iambic pentameter. In Russian as a Foreign Language teaching, textbooks often include an accentuation marker above a stressed vowel, as in молокó (/ˌmə.ləˈkɔ/) with the stress on the final o, to train identification of stress placement in vocabulary acquisition (Chernyshov & Chernyshova, 2022).

An umbrella term for directly teaching stress patterns among researchers is rules-based instruction, also referred to as explicit instruction (Chen et al., 2025; Gordon & Darcy, 2022). A regular feature of rules-based instruction is the inclusion of general rules for discerning where to place stress in an English word. While not absolute rules for English stress patterns, it is a general rule for two-syllable nouns to stress the first syllable, as in teacher (/ˈtiːʧə/), table (/ˈteɪbᵊl/), and music (/ˈmjuːzɪk/), and for two-syllable verbs to stress the second syllable, as in declare (/dɪˈkleə/), explain (/ɪkˈspleɪn/), and forget (/fəˈgɛt/). Following this rule, learners are expected to deduce stress placement from recognising a word's part of speech, although there is the potential for error with irregular stress placement on nouns such as adult (/əˈdʌlt/) or verbs such as answer (/ˈɑːnsə/).

Based on their survey of exceptional language learners, Dörnyei and Mentzelopoulos (2022) argue that there is no silver bullet for developing nativelike speech. Given the testimonial of nativelike speakers regarding how they themselves developed, there may be multiple pathways and a dynamic range of factors that matter for achieving L2 fluency and advanced stress pattern control and recognition (Dörnyei & Mentzelopoulos, 2022; Hyltenstam, 2021). The researchers attribute success to motivation, a sense of affinity with the target language, an ability with mimicry or music, increased attention to pronunciation, a sense of ownership of the L2, and a shared sense of identity between the L1 and L2. However, no single factor was common to all exceptional language learners. An intervention aiming to teach L2 stress patterns may, therefore, benefit from analysing a range of extraneous variables that could contribute to stress pattern acquisition when reviewing the intervention approach.

### 2.6. Research into the Teachability of L2 Stress Patterns

Having established the $H_0$ and $H_1$, there is a need to weigh the evidence for and against the teachability of L2 stress patterns. The breadth and depth of experimental evidence related to stress patterns is limited (Lee et al., 2014), and until recently there was a dearth of true experimental studies related to the teachability of word stress

(Chen et al., 2025). With the exception of a supra-segmental training intervention in Japan (Saito & Saito, 2017) and a music intervention study in Lithuania that did not report quantitative findings (Balčytytė-Kurtinienė, 2018), there seems to be almost no reliable research into the teachability of stress-timed rhythmic patterns. From the evidence reviewed below, there is a consensus that word stress is a teachable L2 prosodic skill, and there is insufficient evidence for or against the teachability of stress-timed rhythm.

*Table 1. Summary of Quantitative Research into the Teachability of Stress Patterns (1/2)*

| Summary of Quantitative Research into the Teachability of Stress Patterns (1/2) | | | | | | |
|---|---|---|---|---|---|---|
| **Study** | **Experimental Treatment** | **Control Group Conditions** | **Study Design** | **Sample Size** | **Effect Size** | **Statistical Significance** |
| **Lee et al. (2014)** | N/A | N/A | Meta-analysis | 22 | Within-group: $0.99 \leq d \leq 1.18$ Between-group: $0.91 \leq d \leq 1.12$ | Statistically significant improvement in word stress abilities from instructional approaches |
| **Yenkimaleki and van Heuven (2016)** | Acoustic-perceptual training | Listening practice | RCT | 36 | Unreported | Significant improvement for experimental group |
| **Saito and Saito (2017)** | Supra-segmental based instruction | Meaning-oriented instruction | Quasi-experiment | 20 | $\text{Text A: } d = 1.39.$ $\text{Text B: } d = 1.19.$ | Significant gains for experimental group |
| **Sadat-Tehrani (2017)** | Rules-based instruction | No control group | Quasi-experiment | 38 | $d = 1.67$ | Statistically significant reduction in stress errors |
| **Chen and Tian (2020)** | Rules-based instruction; acoustic-perceptual training | No control group | Quasi-experiment | 33 | Unreported | Significant improvement for both experimental methods |
| **Chen et al. (2025)** | Rules-based instruction; acoustic-perceptual training | Basic phonics training | RCT | 90 | Perception: $R^2 = 0.274$. Production: $R^2 = 0.303$. | Small improvement for both experimental methods |

*Table 2. Summary of Quantitative Research into the Teachability of Stress Patterns (2/2)*

| Summary of Quantitative Research into the Teachability of Stress Patterns (2/2) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Study** | **Duration** | **Outcome Measure** | **Context** | **Proficiency Level** | **Test Design** | **Generalisability** | **Trust Rating (Gorard, 2014)** |
| **Lee et al. (2014)** | N/A | N/A | N/A | N/A | N/A | Limited to 22 studies of inconsistent quality | N/A |
| **Yenkimaleki and van Heuven (2016)** | 8 hours | Auditory word recognition | EFL, L1 Farsi interpreter trainees in Iran | No mention | Pre-test, post-test | Limited to Farsi-speaking interpreter trainees | 1.5/4 |
| **Sadat-Tehrani (2017)** | 9 weeks | Stress placement accuracy in homographs | ESL, pre-university course in Canada, multi-cultural | Mixed proficiency | Pre-test, post-test | Potentially generalisable across proficiency levels | ¼ |
| **Saito and Saito (2017)** | 3 hours over 6 weeks | Stress accuracy in multi-syllabic words | EFL, L1 Japanese | Beginner | Pre-test, post-test | Limited to beginner Japanese EFL learners | 1.5/4 |
| **Chen and Tian (2020)** | No mention | Word stress perception and production | ESL, Hong Kong university | No mention | Pre-, post-, delayed post-test | Limited to ethnic Chinese ESL learners | ¼ |
| **Chen et al. (2025)** | Eight 45-minute sessions over 4 weeks | Word stress perception and production | ESL, L1 Mandarin and L1 Cantonese, Hong Kong university | No mention | Pre-, post-, delayed post-test | Limited to ethnic Chinese ESL learners | 2.5/4 |

### 2.6.1 Lee et al. (2014) Meta-Analysis

In a meta-analysis of pronunciation instruction, Lee et al. (2014) found a large effect size from a synthesis of experimental and quasi-experimental studies of word stress instruction $(N = 22)$ that reported quantitative results. While the effect sizes of L2 pronunciation instruction were mostly homogenous and large $(d = 0.89)$, the effect sizes for the within-group $(0.99 \leq d \leq 1.18)$ and between-group $(0.91 \leq d \leq 1.12)$ word stress interventions were noted as larger than average. The moderator analysis observed longer interventions, feedback, and controlled outcome measures as significant mediators for determining the success of pronunciation interventions. Criticising the body of research on pronunciation instruction, the researchers concluded that word stress, along with elision, linking, and articulation, is an under-researched aspect of phonology instruction. They further argue that interactions between treatments and learner background factors have been neglected, despite theoretical links between the variables.

### 2.6.2. Chen and Tian (2020) Quasi-Experiment

In a conference paper, Chen and Tian (2020) report findings from a quasi-experimental trial to examine the effectiveness of explicit rule instruction and acoustic-perceptual instruction as approaches for teaching word stress. While not a true experiment, the study found that word stress is a teachable skill. The participants $(N = 33)$ were learners of English at a university in Hong Kong. The first language of participants is reported as Chinese, although the dialect of Chinese is not specified. Unreported characteristics of the participants include their gender balance, proficiency level, and age range. It is notable that, as university students in Hong Kong, the participants needed to achieve at minimum an intermediate level of English proficiency to enter the university (Lau, 2020). The trial had a pre-, post-, and delayed post-test design with two experimental groups and no control group (Cohen et al., 2018). Significantly, there was no randomisation of participants prior to group allocation.

Evaluating the study using Gorard's sieve (2014)[2], the experiment scores one-star, or $1/4$, for trustworthiness. Despite not reporting the frequency and duration of its intervention approach, the experiment could rate two-stars for the fidelity of its intervention given the level of detail reported for the two experimental classes. The project scores one or less for its lack of a control group in the research design, lack of group equivalence, high attrition rate $(17.5\%)$, and non-consideration of threats to validity. The design of the study could have been improved had the investigators established participant background data and used this to make a balanced or matched comparison. As part of improving the design, randomisation would have been beneficial for mitigating the threat of selection bias. While scoring low for trustworthiness, the findings of the paper favour the hypothesis that word stress is a teachable L2 skill.

### 2.6.3. Chen et al. (2025) Randomised Controlled Trial

In a replication of Chen and Tian (2020), Chen et al. (2025) adjusted the research design to meet the standards of a true experiment. Corroborating the findings of the prior quasi-experiment, the study found that both explicit instruction and acoustic-perceptual instruction improve production and perception of word stress. The participants $(N = 90)$ were Chinese L2 English-speakers at a university in Hong Kong, who self-reported fluency in Mandarin and Cantonese. The researchers randomly allocated the participants into three-groups: a rule-based instruction group $(N = 30)$, an acoustic-perceptual instruction group $(N = 30)$, and a control group $(N = 30)$ that only received phonetics instruction. The inclusion of a control group for comparison is a notable Improvement on the prior design (Gorard, 2014). The participants took eight 45-minute training sessions over four weeks and focused on the structure, similarity, and vowel reduction feature of stress patterns. While the explicit instruction group learned stress rules, the acoustic-perceptual group analysed acoustic cues with Praat, and the comparator group studied basic phonetics. The measurement of word stress production and perception was the same as in Chen and Tian (2020). The results

[2] Gorard's sieve is an appraisal tool for evaluating the trustworthiness of experimental trials.

suggested that all instruction approaches led to improved outcomes, albeit with different degrees of significance.

Evaluating the trustworthiness of the trial, the research design meets the standards of a true experiment (Boutron et al., 2017). Unlike the prior study, Chen et al. (2025) report the frequency and duration of the intervention, randomised participants, discussed limitations and threats to validity, and achieved at least a matched comparison of groups. This raises the rating of the RCT's design, fidelity, and validity to either a two-star or almost three-star rating when applying Gorard's sieve (2014). While participant gender and dropout rates are not reported for the study, the surveying of participants' L1 background enables potential insights into the differences of learning word stress for L1 Mandarin and L1 Cantonese learners in the study's context. The strength of the research design gives reinforcement to this and the prior study's conclusion that, contrary to the $H_0$ of Jenkins (2002), word stress is a teachable L2 phonological skill.

### 2.6.4. Saito and Saito (2017) Quasi-Experiment

In a quasi-experimental trial, Saito and Saito (2017) examined the effects of suprasegmental-based instruction on the development of word stress, rhythm, and intonation for Japanese EFL learners. The study used a pre-post test design with an experimental and control group structure. The participants $(N = 20)$ were first-year university students in Japan, who were assessed as beginner English learners according to TOEIC results. The study did not report the gender balance or exact age range of participants.

The outcome measures for the study assessed the non-production and misplacement of primary stress in utterances of multisyllabic words. For each test, participants read aloud two texts that included a target list of multi-syllabic words, and a native-speaker made an intuitive assessment of the accuracy of the participants' stress production for the target words. A second marker verified the native-speaker's assessments with a

moderately high level of agreement at $k = 0.7$. A paired t-test of the results yielded a large effect size for the experimental group ($\text{Text A: } d = 1.39, p = .002; \text{Text B: } d = 1.19, p = .005$), and found that explicit instruction in word stress reduced the non-production of primary stress from 52.33% in the pre-test to 32% in the post-test. While the suprasegmental instruction was effective in reducing the non-production of stress patterns among participants, the combination of rhythm, intonation, and stress training for the course complicates understanding of whether these skills are best taught together or whether one skill was potent for developing participant control over stress production. Applying Gorard's sieve (2014), the lack of pre-specification for the outcomes limits their trustworthiness, although they are sufficiently valid to be rated at two-stars, or $2/4$.

### 2.6.5. Sadat-Tehrani (2017) Quasi-Experiment

In a quasi-experiment, Sadat-Tehrani (2017) investigated the effect that teaching lexical stress rules and tendencies had on learners' stress placement in an ESL college classroom context in Canada. The study reports a large effect size from its rules-based instruction treatment but has issues of research design and unreported information that limit its robustness.

The experiment found that rules-based instruction over 9 weeks had a large effect size of $d = 1.67$. From pre-test to post-test, the percentage of primary stress errors in recorded speech declined from 33.8% to 18.3%. For the intervention, the researcher took a presentation, practice, production approach to teaching word stress, and designed interactive worksheets that practiced 16 rules or tendencies of English stress patterns. The production stage of the lesson involved activities such as group discussions and role plays. Each lesson was face-to-face, scheduled weekly, and lasted 25 minutes. To measure stress placement, participants recorded themselves reading aloud a list of one-hundred words. The researcher marked each word for the accuracy of stress placement.

### 2.6.6. Yenkimaleki and van Heuven (2016) Randomised Controlled Trial

Aiming to conduct a true experiment, Yenkimaleki and van Heuven (2016) investigated the effects of explicitly teaching prosodic features of speech on word recognition skills with trainee interpreters of English in Iran. The study has strengths of research design and fidelity, although the research report has missing or opaque data that limits the reliability of its claims. While the study does not provide evidence for the teachability of word stress for speech production, it concludes that training prosodic features of speech has a large and statistically significant effect on improving the perception of English stress patterns.

Evaluating the paper using Gorard's sieve (2014), the study could score three-stars for its research design and fidelity while scoring one-star or less for its outcomes and absence of attrition data. The advantages of the research design are its balanced comparison of groups and use of randomisation. However, the data analysis does not state an effect size from the comparison of groups, and the independent calculation made using the available data is conspicuously high. Overall, the study rates between one- and two-stars for its trustworthiness (1.5/4). To improve on the study's design, a replication could report attrition, the effect size, and threats to validity. With the evidence given, the study indicates that perception of English word stress is teachable for EFL learners through the training of prosodic awareness.

### 2.6.7. Summary of Quantitative Research into the Teachability of L2 Word Stress

From the studies reviewed, there is a consensus that the production and perception of word stress are teachable skills for L2 English learners (Table 1). Two of the five experimental trials (Sadat-Tehrani, 2017; Saito & Saito, 2017) and Lee et al.'s (2014) meta-analysis indicate that L2 word stress instruction has a large effect size on participant outcomes, although one recent and relatively robust RCT found a small effect size from rules-based and acoustic-perceptual instruction approaches (Chen et al., 2025). None of the studies suggest that Jenkins (2002) assertion that word stress

is unteachable is a sound claim. While there is only one study reporting quantitative results on the teachability of stress-timed rhythm, the evidence of the quasi-experimental trial supports the hypothesis that stress-timing can be taught (Saito & Saito, 2017).

The studies have notable limitations, however, that moderate their reliability. The most salient issue from the reviewed studies is the lack of true experiments on the teachability of stress patterns. From the studies reviewed, 3 of the 5 experiments were quasi-experimental and only 1 RCT reported an effect size. There was a common lack of data on participant proficiency levels, unreported attrition rates in 4 experiments, and an absence of control groups in 2 experiments. Lee et al. (2014) concur that, while quasi-experiments offer a guide to practitioners, the absolute effects of an intervention can only be measured through rigorously controlled study designs.

To amend the research gaps visible from this review, future studies into the teachability of stress patterns can aim for at least three enhancements. First, there is a need to establish learner background variables, such as L1 background and sociocultural status, to understand how these factors relate to the intervention treatment (Dörnyei & Mentzelopoulos, 2022; Lee et al., 2014). Second, the outcomes of the intervention should depend not only on controlled practice activities but also free practice or performative language use (Lee et al., 2014). Third, to broaden understanding of the intervention effects with different age groups, a focus on younger learners is also needed. Given the value of stress pattern instruction for young learners entering speech and drama activities, there is incentive to understand how to train young learners to develop abilities with stress pattern management.

### 2.7. Perceptions of Learning Stress Patterns Among L2 Learners

One aspect of the claim that stress patterns are unteachable is the perspective that word stress patterns are too complex to learn. Whether this is true or not can depend on group and individual learner differences (Li et al., 2022), and therefore requires

attention to the context and participants who are being taught stress patterns. Chen et al. (2025) and Couper (2012, 2022) have investigated perceptions of learning word stress and found that learners often view importance in learning stress pattern accuracy despite reporting complexity in internalising patterns.

### 2.7.1 Chen et al. (2025) Learner Attitudes Towards Word Stress Instruction

As an extension of their RCT on the teachability of word stress, Chen et al. (2025) interviewed $N = 45$ participants from the experimental groups in the post-intervention stage of their study to understand their attitudes towards the instruction that they received. 70% of participants from the rules-based instruction group $(N = 21)$ reported that learning rules for word stress was complex, and 80% of participants from the acoustic-perceptual intervention group $(N = 24)$ reported complexity for internalising word stress. Both groups attributed positive value to their interventions, but emphasised different benefits: the rules-based group appreciated the instructional approach for elucidating the similarity of stress patterns for words depending on their part of speech, and acknowledged the use of learning vowel reduction for clear articulation; the acoustic-perceptual group, however, emphasised the value of learning word structure, and attributed significance to learning stressed syllables with visual support. The groups differed on their learning preferences after the intervention, with the rules-based group approving of natural exposure alongside instruction in stress rules and the acoustic-perceptual group preferring visual analysis. The acoustic-perceptual group suggested that they had challenges perceiving and producing reduced vowels after their intervention, which Chen et al. (2025) attribute to the complexity of formant analysis. Three trained raters coded and reviewed the interview data for thematic analysis, suggesting a high-degree of rigour in determining the validity of learner attitudes towards the instructional approaches (Cohen et al., 2018).

### 2.7.2 Couper (2012) L2 Learner Perceptions of Word Stress

In a small-scale exploratory study, Couper (2012) interviewed L2 English learners from diverse L1 backgrounds to understand their perceptions towards learning word stress. The participants $(N = 9)$ studied pronunciation as part of a three-day pre-university preparation course, although the fidelity of their involvement is not transparent as Couper states that not all participants joined their scheduled classes. The participants completed feedback forms and discussed their reflections on learning word stress each day of the course. Couper (2012) found that learner perceptions of English word stress were framed by the rhythmic patterns of their L1. Japanese students, for example, were likely to perceive written words as having a mora-timed rhythm and would divide words into syllable structures that mimicked those of Japanese. He recommends that teachers adapt their instructional metalanguage with learners according to their L1 and individual learning needs. He, furthermore, recommends comparing and contrasting English stress patterns with the patterns of a learner's L1 to elucidate differences in speech delivery. He reports that learners considered word stress useful but difficult to learn, and that participants perceived frequent shadowing and memorisation of nativelike stress patterns as positive learning approaches for automating the skill.

### 2.8. Summary

From this literature review, it is evident that the research literature favours the $H_1$ that word stress can be taught over the $H_0$ that they are unteachable. The research literature further suggests that, despite their perceived complexity, word stress and speech rhythm are of interest and significance to L2 English language learners. There is an undersupply of research into the both teachability of word stress and stress-timed rhythm, however. The trustworthiness of research can be enhanced through the inclusion of background factors in L2 learning, the inclusion of free practice and performative language use in outcome measures, and the inclusion of non-university aged participant cohorts, such as young learners, in future studies.

# 3. Methodology

To investigate four lines of research posited in the literature review, the current study used an intervention approach with a parallel mixed methods design (Melnyk & Morrison-Beedy, 2012; Newby, 2014; Teddlie & Tashakkori, 2011). In the following chapter, the rationale for the research design will be given, including justifications for the use of tests and a questionnaire to collect quantitative data and semi-structured interviews for collecting qualitative data. I will review the characteristics of the context and participants and, furthermore, give a justification for the project's instruments, research procedure, and data analysis approach. I will also outline the ethical standards and research limitations that factored into the conduct and outcomes of the project.

## 3.1. Research Questions

The literature review posited 4 RQs that the study aimed to investigate (Table 3). The conjectures that framed this research were the $H_0$ that stress patterns cannot be taught in L2 contexts and the $H_1$ that stress patterns are teachable in L2 contexts. The teachability of stress patterns has receptive (RQ1) and productive (RQ2) components that necessitated independent measurements in the testing procedure (Hardison, 2013; Pickering, 2013). Following the precedent of Chen et al. (2025), the experiment tested the teachability of explicit instruction for developing stress perception (RQ1a). Answering one research gap delineated in Lee et al. (2014), the study also attempted to measure the effect of the intervention on stress pattern application in spontaneous speech (RQ2a). Recognising the importance of stress pattern control to speech performance in the study's context of Hong Kong (Lee, 2016; Olive, 2019), the research aimed to investigate whether the intervention had an effect on stress pattern control in read-aloud performance scenarios (RQs 2b, 2c). The study, furthermore, aimed to yield understanding of how different learner background factors, such as language proficiency (RQ3a), prior prosodic skillset (RQ3b), and sociocultural background (RQ3c), related to intervention outcomes. Lastly, the study investigated

participant attitudes towards learning stress patterns in the intervention lesson and its perceived usefulness for the participants (RQ4).

*Table 3. Research Questions*

| Research Questions | | |
|---|---|---|
| **No.** | **Research Question** | **Measurement** |
| **1** | To what extent does the training of stress patterns improve perception when listening for stress patterns? | Pre-test<br>Post-test<br>Delayed post-test |
| **2** | To what extent does the training of stress patterns improve the accuracy of stress production in:<br>(a) spontaneous language use?<br>(b) word stress production?<br>(c) stress-timed rhythm production? | Pre-test<br>Post-test<br>Delayed post-test |
| **3** | What is the relationship between the outcomes of stress pattern training and:<br>(a) students' initial level of language proficiency?<br>(b) students' initial prosodic ability?<br>(c) students' sociocultural background? | Background information survey<br>Pre-test<br>Post-Test<br>Delayed Post-test |
| **4** | What are students' attitudes towards learning stress patterns and the usefulness of developing stress pattern control? | Survey questionnaire<br>Semi-structured interviews |

### 3.2. Research Design

The $H_0$ and $H_1$ posited not only the potential for an experiment and statistical testing, but also the potential to investigate individual and group differences as dimensions of L2 word stress acquisition (Bigelow & Watson, 2013; Dörnyei, 2014). Given that statistical, psychological, and sociocultural considerations could each factor into a broad understanding of the teachability of stress patterns, the study adopted a parallel mixed methods approach, which could yield triangulated results from a range of data

sources, over a solely quantitative or qualitative focus (Cohen et al., 2018; McKinley & Rose, 2020).

The philosophical paradigm underpinning the research design was post-positivist. Following the post-positivist principle that research should aim to establish warranted claims for education practices (Burbules & Phillips, 2000), the study applied an experimental approach to inquire into the falsifiability of the hypotheses that framed the research project. In falsifying either the $H_0$ or $H_1$, the research findings aimed to contribute towards a scientific understanding of the teachability of stress patterns in L2 contexts. While post-positivism accepts that absolute truth is unobtainable in the social sciences (Popper & Popper, 1979), the paradigm complied with the research project's aspiration of producing comprehensive, replicable, and generalisable scientific evidence to support a warranted assertion for the teachability of stress patterns. In addition, the paradigm is open to mixed methods approaches that can synthesise quantitative and qualitative data points to produce a broad assertion of whether either hypothesis is warranted (Denscombe, 2017; Panhwar et al., 2017).

### 3.2.1. Approaches

To explore the hypotheses of the study, the research design combined an RCT experiment with survey information and semi-structured interviews to collect both quantitative and qualitative data. The following section provides a justification for the use of these research approaches.

#### 3.2.1.1. RCT

Following the scientific method, there was a need to investigate the causal relationship between stress patterns and its teachability to test the study's hypotheses (Dornyei, 2007; Gower, 2012). I chose to use an RCT design in order to meet as many of the conditions of a true experiment as possible (Cohen et al., 2018). The case for RCTs in education has been made on the grounds of their rigour, precedent for successful outcomes, and favourable qualities over alternative experimental models (Torgerson

& Torgerson, 2001). While RCTs in education can be criticised for the difficulties involved in blinding researchers and participants and the complexity of controlling variables in educational environments (Hutchison & Styles, 2010), Plint et al.'s (2006) systematic review of RCTs that uphold the rigour of the CONSORT statement (Boutron et al., 2017) endorsed the model as a reliable approach. Compared to alternative experimental designs, such as quasi-experimental designs or the single-case ABAB design (Cohen et al., 2018), RCTs have the advantage of random allocation of participants, thereby mitigating the risk of selection bias (Cohen et al., 2018; Torgerson, 2009).

#### 3.2.1.2. Questionnaire

To broadly understand the attitudes of participants towards learning stress patterns and the perceived usefulness of developing stress pattern control, the study applied a self-report questionnaire instrument (Cohen et al., 2018; McKinley & Rose, 2020). To survey the participant group that learned stress patterns, I issued the questionnaire as an exit ticket at the end of the experimental intervention lessons (Brown, 2022). For efficiency and accessibility, I chose an image-based Likert scale to gauge responses to the learning experience and perceived usefulness of the lesson content (Leutner et al., 2017). Dornyei (2007) argues that one limitation of self-report questionnaires is that only surface-level data is collected on the topic of investigation. Consequently, the study attempted to explore participant attitudes in further depth with semi-structured interviews.

#### 3.2.1.3. Semi-structured interviews

To explore the attitudes of participants learning stress patterns in-depth, the study conducted semi-structured interviews with 4 participants from the experimental groups. These interviews were semi-structured to allow for flexibility in the questioning approach and to explore attitudes towards learning stress patterns as they arose (Rolland et al., 2019). The interviews were one-to-one in a single session and used English, the lingua franca of the context. As English was not the L1 of the participants,

I gave the interviewees a preview of the planned questions before the interview and allowed them time to consider their answers (Rolland et al., 2019). The original plan was to speak with two male and two female participants for a maximum of 30 minutes each, and to include participants from basic $(N = 1)$, intermediate $(N = 2)$, and proficient $(N = 1)$ language proficiency backgrounds. Following the approved ethical process for the project, I recorded the interviews using Microsoft Teams and transcribed the data for thematic analysis.

### 3.3. Setting

The context of the study was an aided secondary school in Hong Kong that uses Chinese as its main MOI. The only subject not taught in Chinese at the school is English Language. Following Kachru's (1992; 2006) model of World Englishes, the setting of the study is on the Outer Circle of World Englishes and the language is taught as an official language of the region. The sponsorship body of the school is an evangelical Christian association that funds the institution in cooperation with the Hong Kong Education Bureau EDB. Axiologically, the school ethos can be characterised as having elements of both Christian and Confucian heritage values (Carless, 2012; Tse & Chan, 2023). Following the curriculum guidelines of the EDB (Bureau, 2017a, 2017b), English is taught as a mandatory subject from the first year of primary school to the last year of secondary school, or from the ages of 6 to 18. In secondary school, the structure of the curriculum follows that of an English grammar school or European gymnasium (Dörnyei, 1995; Steinhaus, 2015), with 3 years of general academic training in Junior Form, from ages 12 to 15, and 3 years of specialized academic learning in Senior Form, from ages 15 to 18. There is a culture of shadow schooling in the study setting (Bray, 2013; Chan & Bray, 2014), which poses the potential of a hidden and untracked variable influencing the development of prosodic abilities for some participants throughout the project.

### 3.4. Participants

Participants for the study were students in Form 5 studying at the secondary school for whom I was their English teacher. The eligibility criteria for the research participants had three conditions. To control for age, the first condition was that participants should be aged from 16 to 18 years old. The project audited age for ethical purposes rather than as a means of explaining individual differences (Ellis, 1994; Pfenninger, 2017). The specified range complied with the Gillick guidelines for evaluating whether young people can give informed consent prior to joining the research project (Griffith, 2016). To manage contextual variables (Brown, 2011), the second condition was that participants had to be studying the Senior Form English curriculum at a Chinese medium-of-instruction secondary school and the third condition was that participants had to have the researcher as their English teacher.

I invited all Form 5 students at the focus school to participate in the RCT and questionnaire (Appendix J). The year group had $N = 100$ potential participants that met the eligibility criteria, and $N = 50$ consented to participation in the project. The consenting participants completed a background information survey to verify their eligibility for the project. To support an answer to RQ3, the background survey data accounted for a range of sociocultural factors, including age, gender, parental education, ethnicity, first and additional languages, and prior education (Bourdieu, 1997; Rea & Parker, 2014). Some participants did not consent to recording their voice for the spoken segments of the pre- and post-tests and only consented to taking the listening component of the tests. Following attrition and respecting these consent boundaries, there were $N = 40$ participants contributing to the receptive skills data set and $N = 37$ contributing to the productive and performance skills data set in total.

### 3.4.1 Participant Characteristics

Table 4 summarises the characteristics of participants.

Table 4. Summary of Participant Characteristics

| Summary of Participant Characteristics | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Categories/Values** | **Receptive Skills** | | **Productive Skills** | |
| | | **Count** | **Percentage (%)** | **Count** | **Percentage (%)** |
| **Gender** | Female | 21 | 52.50 | 19 | 51.40 |
| | Male | 19 | 47.50 | 18 | 48.60 |
| | Other | 0 | 0.00 | 0 | 0 |
| **Age** | 16 | 32 | 80.00 | 29 | 78.40 |
| | 17 | 7 | 17.50 | 7 | 18.90 |
| | 18 | 1 | 2.50 | 1 | 2.70 |
| **Parental Education** | High school | 24 | 60.00 | 23 | 62.20 |
| | Bachelor's degree | 10 | 25.00 | 10 | 27.00 |
| | Associate's degree | 2 | 5.00 | 0 | 0.00 |
| | Other (Middle School) | 1 | 2.5 | 1 | 2.70 |
| | Master's degree | 1 | 2.5 | 1 | 2.70 |
| | Not given | 1 | 2.5 | 1 | 2.70 |
| **L1** | Cantonese | 39 | 97.5 | 36 | 97.30 |
| | Mandarin | 1 | 2.50 | 1 | 2.70 |
| **L2** | Cantonese | 1 | 2.50 | 1 | 2.70 |
| | Mandarin | 40 | 92.5 | 36 | 91.90 |
| | English | 2 | 5.00 | 2 | 5.40 |
| **L3** | English | 30 | 75.00 | 28 | 75.70 |
| | None | 10 | 25.00 | 9 | 24.30 |
| **English Proficiency (Self-rating)** | Beginner | 19 | 47.50 | 16 | 43.20 |
| | Intermediate | 19 | 47.50 | 19 | 51.40 |
| | Proficient | 1 | 2.50 | 1 | 2.70 |
| | Fluent | 1 | 2.50 | 1 | 2.70 |
| **Ethnicity** | Hong Kong Chinese | 40 | 100.00 | 37 | 100.00 |

### 3.5. Procedure

The procedure for the RCT followed the principles of the CONSORT statement (2017). I assessed applicants for their eligibility, tested participants to establish a baseline measurement of language proficiency[3], randomly allocated the participants to experimental and control groups, and followed up with a post-test and delayed post-test. The procedure incorporated additional data collection procedures at times as close as feasibly possible to the intervention lessons. The research procedure can be seen in Table 5.

*Table 5. Outline of Data Collection Procedure*

<table>
<tr><th>Step</th><th colspan="4">Research Procedure</th></tr>
<tr><td>1</td><td colspan="4">Assess students for eligibility (Background information survey – Appendix A)</td></tr>
<tr><td>2</td><td colspan="4">Pre-test participants (Pre-Test – Appendix B)</td></tr>
<tr><td>3</td><td colspan="4">Randomisation</td></tr>
<tr><td rowspan="4">4</td><td colspan="4">Group Allocation</td></tr>
<tr><td colspan="2">Experimental Groups</td><td colspan="2">Control Groups</td></tr>
<tr><td colspan="2">Treatment Groups</td><td>Placebo Group</td><td>No-Treatment Group</td></tr>
<tr><td>Group X</td><td>Group Y</td><td>Group Z</td><td>Group θ</td></tr>
<tr><td rowspan="3">5</td><td colspan="4">Intervention Lessons</td></tr>
<tr><td>Group X</td><td>Group Y</td><td>Group Z</td><td>Group θ</td></tr>
<tr><td colspan="2">Stress pattern training (explicit instruction), completion of attitudinal survey (Appendix C) and interviews (Appendix D)</td><td>Speech practice lessons (indirect instruction)</td><td>Regular lessons until delayed post-test</td></tr>
<tr><td>6</td><td colspan="4">Post-test participants (Post-test – Appendix E)</td></tr>
<tr><td>7</td><td colspan="4">Delayed post-test (Delayed Post-test – Appendix F)</td></tr>
<tr><td>8</td><td colspan="4">Comparison of outcomes</td></tr>
</table>

[3] As too few participants completed the LexTale test, the procedure used self-reported language proficiency data from the background information survey.

### 3.5.1 Enrolment

The enrolment procedure involved recruiting participants, acquiring consent from prospective participants and their parents, and verifying their eligibility. The consent forms were modelled on the templates of Oxford University's CUREC documents. Prior to enrolment, I sent a letter to the principal of the participating school, who gave consent to conducting the research at the institution (Appendix G). Subsequently, I began recruiting participants using flyers and presentations to inform students of the project. I distributed an information sheet in lessons (Appendix H), the background information survey (Appendix A), and participant consent form to the $N = 100$ students eligible to join the project. When I gave students a presentation about the project, I facilitated questions to help them evaluate their interest in enrolling. $N = 50$ students completed the consent forms to enrol in the project.

Concurrent with the information distributed to participants, I distributed to parents and legal guardians, through the school's formal contact procedure, an information sheet and opt-out consent form (Appendix I). I reviewed the applications and consent status of the participants and removed from the participant pool those applicants that did not meet the inclusion criteria or have parental/guardian consent. At the end of this process, the project had $N = 40$ eligible participants with full consent to join the receptive skills component of the study and $N = 37$ participants with full consent for the productive skills component of the study.

### 3.5.2. Allocation

To mitigate selection bias, the allocation of participants to experimental and control groups followed a matched pairs design. Borg and Gall (1979) give 3 steps for allocating participants in matched pair experiments, which the research attempted to follow despite extenuating circumstances.

The first step was to measure a dependent variable, which in this case was the pre-test that diagnosed participant stress pattern skills. The eligible participants took the pre-test on the 17 February. Originally, the schedule planned for the pre-test to take place on 12 February, which would have granted sufficient time to mark the papers

before the intervention lessons, but this date conflicted with an event that a colleague requested the test to not overlap with. Due to the pre-test moving to a later date, there was not enough time to mark the examination papers to determine groups according to initial stress pattern abilities. As an alternative, the participants' self-reported English proficiency levels were harnessed as a data point for allocation. Each group had an approximately equal range of proficiency levels within their design. The alteration to the allocation process poses a risk to the validity of the research results, as the baseline measurement of stress patterns for groups could have a high standard of deviation that would convolute understanding of the effectiveness of the intervention. If the project were to be replicated, it would be an improvement to establish a baseline measurement of stress patterns for the group allocation.

The next step was to randomly assign one person from each pair to the control and experimental groups. I used the website www.randomizer.org to randomly assign one person from each pair to the control and experimental groups (Randomizer.org, 2025). Following the Solomon three-group design (Cohen et al., 2018), the allocation further separated participants into matched sub-groups. Attrition and individual requests for reallocation undermined the balance of groups. I adopted the position of Law (2004) that conducting social science research in fluid and authentic environments is likely to lead to mess, and that this should be viewed as an opportunity for creative and ethical administration rather than a failure of the research.

did not train stress patterns directly; however, following the indirect instruction hypothesis (Morrow, 2013; Westerhof, 1992), the intervention approach could have indirectly trained delivery and performance of a poem through the correct discrimination of minimal pairs and rhyming patterns. For instance, recognition of the difference between the present tense read (/ɹiːd/) and past tense read (/ɹɛd/) improves coherence and sonority for performance of The Pig (Dahl, 2012), the poem used in the study's pre-test. Group Z, therefore, received a treatment that could be classified as inductive stress pattern training, in contrast to the deductive stress pattern instruction of the experimental classes (Thornbury, 2011).

#### 3.5.2.2.1. Treatment Fidelity

The intervention class with Group Z met its aims but also had problems of lateness and temporary distraction. According to the field notes, participants were positive and cooperative during the lesson. While the rate of absenteeism was not severe, as 11 out of 12 participants attended, the lesson started 8-minutes behind schedule due to participant lateness. The late start did not result in the removal of any lesson segments, although there was less time for the performance of a poem at the activation stage. The class temporarily went off-topic during the mini-plenary devoted to the discussion of rhyme as students distracted themselves discussing rap battles in popular culture, which was only tenuously related to the intended topic.

Like the experimental classes, the fidelity of the lesson was favourable for adherence, quality, and participant responsiveness, but inadequate for exposure (Lemire et al., 2023). The lesson adhered to its lesson plan and integrated prevalent instructional strategies for the recognition and discrimination of minimal pairs (Celce-Murcia et al., 1996; Hancock, 1995) and the identification of rhyme and rhyming patterns (Fleming & Stevens, 2014). The lesson achieved its aims and received positive feedback from participants. The duration, however, was under one hour, when the late start is considered, and this does not seem to satisfy the criteria for sufficient exposure in recommended standards of intervention fidelity (Anders Ericsson, 2008; Lemire et al., 2023).

#### 3.5.3.3. Interviews

The project interviews took place on 28 February. I invited $4$ participants from the experimental groups to sample their opinions on learning stress patterns. These participants gave explicit written consent to the audio interviews. Of the participants invited, $N = 3$ attended their interview. Participants were scheduled for 30-minute interviews each. Participants received the questions before the interview and were given 5 to 10 minutes to consider what to say before the recording (Cohen et al., 2018). The audio from interviews was recorded on Microsoft Teams. It was subsequently transcribed using Microsoft Word and I checked the transcription for accuracy. While interviewing, I took into consideration principles of good interview conduct proposed in Arksey and Knight (1999) and (Gadd, 2004), including the importance of remaining interested, courteous, and responsive to the interviewee.

#### 3.5.3.4. Post-Test

The post-test took place on 03 March. The examination was held after-school with the consenting participants $N = 40$ in the school hall of the school institution that agreed to the project.

#### 3.5.3.5. Delayed Post-Test

The delayed post-test took place on 31 March. The consenting participants $(N = 40)$ that maintained attendance for the project attended the examination after-school. Due to an event at the school, the examination was relocated to an alternative examination room on the top floor of the school institution that consented to the project. The relocation of the delayed post-test introduces an extraneous variable in the test performance of participants that potentially undermines validity of results.

### 3.6. Instruments

There were four instruments used to collect data for the project. Each instrument targeted data that could answer the project's RQs. The stress pattern testing materials were administered as pre-, post-, and delayed post-tests and targeted RQ1 to RQ3, the background information survey supported answering RQ3, while the questionnaire and interviews targeted a solution for RQ4.

### 3.6.1. Background Information Survey

Participants completed a background information survey at the recruitment stage of the project (Appendix A). By design, the survey established standardized information about the participant population. Partly, the information was used to filter out applicants who did not meet the inclusion criteria. For this purpose, the survey included age and education status as data points. To answer RQ3c, the survey requested parental education as an indicator of sociocultural status (Bourdieu, 1997; Lasagabaster, 2008). Predicting the need for a matched comparison, the survey requested gender information to allow the formation of gender balanced groups (Cohen et al., 2018).

### 3.6.2. Word Stress Test Materials

To understand the participants' stress pattern abilities, it was necessary to consider means of testing both perception and production of word stress. Prior studies of prosodic features of speech gave some insight into how to approach this. In a narrative review, Fekar-Gharamaleki et al. (2019) argue that the PEPS-C test is the most reliable instrument available for testing word stress, as it has the advantages over alternatives of being comprehensive, standardized for able and disabled children, and robust for measuring psychometric properties. The PEPS-C had two limitations for the purposes of this study, however. First, the testing software lacks recency, as it requires Visual Basic, a programming language which is no longer integrated into Microsoft Excel, to operate its program. Second, the one-to-one design of the PEPS-C testing scenario limits the efficiency and scale at which data can be collected for an RCT. It was necessary, therefore, to adapt elements of the PEPS-C to enable parametric testing.

To manage procedural variables, I adapted elements of the PEPS-C into paper-based examinations for a standardized testing scenario (Appendices B, E, F). The intention was to allow a large sample of participants to take the same test at the same time and place, and thereby overcome the scaling limitations of the PEPS-C. The examinations were administered in the school hall of the setting. To systematize the examination procedure, a video was created for each examination to deliver instructions, perform the audio for perception tasks, and display time limitations.

I adapted the receptive component of the examination from the PEPS-C testing procedure (Peppé & McCann, 2003). For this, participants listened to a two-syllable homograph and identified its stressed syllable for section 1A. An audio recording stated the two-syllable word, such as 'content' (/ˈkɒntɛnt/), and the participants ticked the box corresponding to the stress location that they heard from four options, for example:

1. content

   A. content □ B. content □ C. content □ D. content □

In addition, for section 1B, the examination paper integrated a multi-syllable stress perception test proposed in Celce-Murcia et al. (1996). Participants listened to the recorded utterance and identified, through ticking a box, the accurate place of primary stress in a multi-syllable word from that utterance. For example:

1. My favourite subject is probably geography.

   A. geography □ B. geography □ C. geography □

Each test included ten multiple-choice questions for section 1A and five multiple-choice questions for section 1B. For each multiple-choice question, participants were awarded 1 point for a correction answer and 0 points for an incorrect response. Combing sections 1A and 1B, the total of possible points for perception of stress patterns was 15.

As RQ2 aimed to explore stress pattern production, the paper-based examination prompted participants to record themselves speaking in response to the task prompts. Sections 2A and 2B of the examination instructed participants to record on a computer tablet an utterance of a two-syllable homograph with stress place on either the first or

second syllable. Participants uploaded the recordings to a secure drive at the end of the test. To illustrate the task, participants for section 2A on the pre-test recorded their utterance of object (/ˈɒbʤɪkt/) with stress on the first syllable. If they returned a recorded utterance with the stress on the first syllable, then they scored 1 point. If they recorded themselves saying object (/əbˈʤɛkt/) with stress on the second syllable, then they received 0 points. Participants who skipped a question also received 0 points. The maximum score on each test for accurate word stress production was 10.

To understand stress pattern application in spontaneous language use, section 2C of the examination included an individual response question, similar to the Hong Kong DSE oral examination (HKEAA, 2023), to sample participant spontaneous speech. The questions had a one-minute time-limit and aimed to be personal and universally answerable, such as the question:

*How do you get to school in the morning?*

To maintain a manageable data quantity, a 25-syllable sample of the spontaneous speech was phonetically transcribed and analysed from the participants recorded responses. The marking procedure analysed speech for evidence of syllable-timed speech (*staccato* delivery), segmented speech, and phonemic alterations. Each use of these features of speech deducted marks from the maximum score of 25 for the 2C section. The following line, for example, scored 3/10 due to syllable-timed speech from syllables 4.1 to 10.1:

| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
|---|---|---|---|---|---|---|---|---|---|---|
| | də | fuːd | wɪʧ | aɪ | laɪk | tuː | iːt | ɪz | ˈkɪm | ʧi |
| **1** | The | food | which | I | like | to | eat | is | kim | chi |

Originally, the intention was to analyse the speech changes to report which features of speech among participants were added or removed from spontaneous speech delivery. However, to maintain efficiency for the completion of the project, the results of 2C combined the errors for the final score of the section. This significantly limits the validity of the section 2C results, as phonemic alterations are factored into the report on stress pattern accuracy. To remedy this problem, further research could conduct a granular analysis of spontaneous speech production.

To understand control of stress patterns in stress-timed speech production for RQ2c, section 3 of the examination prompted participants to record their delivery of a poem using a computer tablet. The examination poems were selected from Roald Dahl (2012) *Dirty Beasts*, as they were deemed to be age-appropriate while maintaining consistency for the variables of thematic content and stress patterns, in this case iambic tetrameter. Participants had 15-minutes to read and record their delivery of the poem. The marking process phonemically transcribed each participants' delivery of 100 syllables from the poem and marked each utterance for stress accuracy. For example:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Score |
|---|---|---|---|---|---|---|---|---|---|
| | ɪn | ˈɪŋgɜː | lənd | wʌns | ðeə | lɪvd | ə | bɪg | 6 |
| 1 | In | Eng | land | once | there | lived | a | big | |

Full marks of 100 were initially assumed for each marking procedure, and one point was deducted for each syllable utterance that deviated from the stress-timed rhythm that the author composed the poem on. Errors that led to point deductions included syllable timing (*staccato* delivery), slowing to segmented speech, intrusion of added syllables, elision of intended syllables, and phonemic alterations such as minimal pair errors. As with the spontaneous speech results, the final tally of scores combined all errors for efficient reporting. The inclusion of phonemic alterations in the score, however, undermines the validity of the report on stress pattern accuracy.

### 3.6.3. Attitudinal Questionnaire

To partially answer RQ4, the participants completed a questionnaire immediately after their intervention lesson that surveyed their attitudes towards learning stress patterns. For efficiency, the questionnaire featured 2 closed questions for participants to self-report their attitudes towards the lesson and its utility. To allow for descriptive statistics of participant attitudes, the questionnaire used a Likert scale design (Cohen et al., 2018). For the data analysis, the scale of data was ordinal, with options ranking from 1, the lowest, to 5, the highest. However, for accessibility, the rating scale had a visual representation of colour-coded expressive faces to indicate attitudes towards the

lesson and its utility (Hall et al., 2016). One limitation of the questionnaire was that it only surveyed surface level attitudes towards learning word stress (Dornyei, 2007).

### 3.6.4. Semi-structured Interviews

To overcome the limitation of the questionnaire for understanding student attitudes towards learning stress patterns, the project scheduled interviews with participants from the experimental group that received an intervention lesson on stress patterns. Hochschild (2009) argues that interviews explore issues to an extent that surveys cannot, and can indicate the role of beliefs, values, and opinions for understanding participant attitudes. As such, the project incorporated one-on-one semi-structured interviews into the research process, with the intention of conducting a thematic analysis of the interview data.

The interview procedure was designed according to the ten investigation stages of Kvale (1996). The questions were thematized to elicit information on attitudes towards learning English stress patterns and explored participant knowledge and feelings towards lessons on stress patterns. For efficiency, I planned six questions to ask interviewees: the first three questions aimed to explore participants feelings, values, and perceptions of learning stress patterns; the latter three questions targeted understanding perceptions of practice activities and personal skill development for learning English stress patterns. The interview approach was semi-structured to allow for conversational flexibility and an appropriate environment of relaxation (Morrison, 2013).

## 3.7. Data Analysis

### 3.7.1. Quantitative Data Analysis

The aim of the quantitative data analysis was to yield a statistically significant effect size result from the dataset (Cohen, 1988). To achieve this for RQs 1 and 2 , the dataset was first tested for normality (Cohen et al., 2018; Dornyei, 2007). Datasets

with normally distributed data received parametric testing, while datasets with non-normal distributions received non-parametric tests (Cohen et al., 2018). For parametric procedures, two-sample t-tests were used for within-group comparisons and independent t-tests were used for between-group comparisons. This yielded a set of Cohen's d statistics for further interpretation. To compare the non-parametric two-sample datasets, a Mann-Whitney U test was performed to compare rank means (Cohen et al., 2018). As no sub-group tests of normality achieved sufficient normal distributions, the data analysis had no ANOVA. However, for a sub-group comparison of mean ranks, the study used non-parametric Kruskal-Wallis tests to yield $\eta^2$ effect sizes.

To answer RQ3, effect sizes were yielded from linear regression analyses on SPSS version 29 that correlated the overall stress pattern scores from each test with participant background variables (Cohen et al., 2018; Dornyei, 2007). The regression analyses yielded an R-value to indicate effect size and a p-value to indicate statistical significance for further interpretation.

To answer RQ4, descriptive statistics report the attitudinal questionnaire results from the intervention participants (Cohen et al., 2018). Using SPSS version 29, the descriptive statistics were tabulated for further interpretation.

### 3.7.2. Qualitative Data Analysis

#### 3.7.2.1. Thematic analysis

The interviews with participants were transcribed using Microsoft Teams. Following protocol to develop a conceptual model of the data (Cohen et al., 2018; Naeem et al., 2023), I familiarized myself with the transcript data, highlighted keywords using NVivo version 14, and organised these keywords into codes. The codes attempted to distil the core message of interviewees (Cohen et al., 2018; Naeem et al., 2023). The codes were organised into themes, which were reviewed for accurate representation of interviewee messages. The themes were reported alongside a count of reference, the percentage of coverage highlighted in the dataset, and selected quotes that conveyed the reasoning or attitude of interviewees.

### 3.8. Ethics

To uphold ethical accountability for the research, the project received approval from Oxford University's CUREC (Appendix K). To meet the committee's standards, the research adhered to the guidelines and principles stipulated by CUREC pertaining to the collection, storage, and management of participant data, including anonymisation.

One ethical consideration for the research was the positionality of myself as the primary researcher (Cohen et al., 2018). Berger (2015) argues that researchers should critically reflect on their position in the social context of a study to recognise the filtration effect of their beliefs and sociocultural status on research outcomes. As a teacher in the context of the study, I had a position of familiarity and authority with the participants that contributed to the project. Mitigating the Hawthorne effect from my role as the researcher was complicated, as participants could ignore encouragement to overlook my dual role as teacher and researcher. An ideal solution would have been to have had a second researcher to separate the teacher and researcher roles. However, as additional researchers were unavailable, the best available practice was to critically reflect on my observations of participant-researcher relations in the field notes.

### 3.9. Limitations

Despite aiming to be a true experiment, the reality of research mess in social science experiments poses limitations on the trustworthiness of the research findings (Clark et al., 2007; Law, 2004). During the research procedure, there was evidence of potential threats to the validity of the findings, including chance effects and attrition bias (Cohen et al., 2018).

#### 3.9.1. Chance Effects

While attempts were made to control relevant variables for the trial, there may been untracked variables that effected the development of stress pattern control for participants. Researchers (Bray, 2013; Chan & Bray, 2014) have recorded the prominence of shadow schooling in the context of the study. It may be the case, therefore, that participants received additional input outside of their treatment group that diluted the causative power of the intervention treatment, such as if they discussed the stress pattern tests with their peers or tutors. The background information survey also did not track educational experiences which debatably influence listening and speech development, such as music training (Hamilton et al., 2024; Rockell & Ocampo, 2014). In a replication study, these variables could be screened in the background information survey to factor into the matched comparison (Torgerson & Torgerson, 2003). As the variables were untracked for this study, it was not possible to mitigate their influence through minimisation during the allocation of groups.

### 3.9.2 Attrition Bias

Attrition of participants from the project posed risks to the reliability and generalizability of the research findings (Torgerson & Torgerson, 2003). Dropouts reduced the sample size and compromised the matched comparison component of the study (Gorard, 2014). Gorard (2014, 2024) argues that a high attrition rate is indicative of untrustworthy research findings.

### 3.9.3. Inter-rater Reliability

The scoring process planned to have a secondary marker to inter-rate the scores on a sample of the test results. However, due to misaligned schedules, the planned marker could not afford time to evaluate the results. The validity of the results could have been enhanced had a significant statistic of inter-rater reliability been achieved.

# 4. Data Analysis

## 4.1. Aims

To answer the RQs of this project, the following section reports the findings of the data analysis. The analysis attempts to answer RQ1, RQ2, and RQ3 using quantitative methods. For this purpose, the data analysis uses SPSS version 29 to process the descriptive statistics, distribution data, and to generate effect sizes. To answer RQ4, the project generated Likert scale data and interview transcripts. The analysis below describes the statistics of the Likert scale outcomes using SPSS version 29 and has used NVivo version 14 for a thematic analysis of interviews with 3 participants.

## 4.2. Tests for Normal Distribution

### 4.2.1. Receptive Skills

#### 4.2.1.1. Receptive Skills Ordinate Group Balance

*Table 6. Two-Sample Group Types x Gender Crosstabultion*

**Two-Sample Group Types * Gender Crosstabulation**

| | | Gender | | N | Percent (%) |
|---|---|---|---|---|---|
| | | Female | Male | | |
| Group Type | Experimental | 11 | 7 | 18 | 45.00 |
| | Control | 10 | 12 | 22 | 55.00 |
| Total | | 21 | 19 | 40 | 100.00 |

*Table 7. Two-Sample Group Types x English Proficiency (Self-Rating) Crosstabulation*

**Two-Sample Group Types * English Proficiency (Self-Rating) Crosstabulation**

| | | English Proficiency (Self-Rating) | | | | Total |
|---|---|---|---|---|---|---|
| | | Beginner | Fluent | Intermediate | Proficient | |
| Group Type | Experimental | 8 | 0 | 9 | 1 | 18 |
| | Control | 11 | 1 | 10 | 0 | 22 |
| | Total | 19 | 1 | 19 | 1 | 40 |

*Table 8. Sub-Group x Gender Crosstabulation*

| Sub-Group * Gender Crosstabulation | | | | | |
|---|---|---|---|---|---|
| | | Gender | | Total | Percent (%) |
| | | Female | Male | | |
| Sub-Group | X | 6 | 4 | 10 | 25.00 |
| | Y | 5 | 3 | 8 | 20.00 |
| | Z | 4 | 6 | 10 | 25.00 |
| | θ | 6 | 6 | 12 | 30.00 |
| Total | | 21 | 19 | 40 | 100.00 |

*Table 9. Sub-Group x English Proficiency (Self-Rating) Crosstabulation*

| Sub-Group * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | Total |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Sub-Group | X | 5 | 0 | 4 | 1 | 10 |
| | Y | 3 | 0 | 5 | 0 | 8 |
| | Z | 5 | 0 | 5 | 0 | 10 |
| | θ | 6 | 1 | 5 | 0 | 12 |

| | | | | | |
|---|---|---|---|---|---|
| **Total** | 19 | 1 | 19 | 1 | 40 |

Following the removal of participants at the eligibility stage, the receptive skills tests had $N = 40$ participants. Throughout the testing process, the receptive skills tests had 0% attrition.

#### 4.2.1.2. Pre-Test

##### 4.2.1.2.1. Two-Sample Distributions

*Table 10. Pre-Test Receptive Skills Test of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Group Type** | **Kolmogorov-Smirnov[a]** | | | **Shapiro-Wilk** | | |
| | | **Statistic** | **df** | **Sig.** | **Statistic** | **df** | **Sig.** |
| **Pre-Test Section 1 Total** | **Experimental** | .175 | 18 | .151 | .901 | 18 | .059 |
| | **Control** | .161 | 22 | .141 | .947 | 22 | .272 |

a. Lilliefors Significance Correction

To assess the normality of pre-test receptive skills scores, the experimental and control groups were evaluated using K-S and S-W tests and a conventional significance level of $\alpha = 0.05$ (Cohen, 2005; Cohen, 1988; Dornyei, 2007). Being relatively close to the K-S normal distribution level $(D = 0)$, the K-S statistics indicate an approximate normal distribution. Similarly, the S-W statistics indicate an approximate normal distribution for both groups, as they approach the S-W normal distribution level $(W = 1)$. The experimental group $(D = .175, p = .151;\ W = .901, p = .059)$ may have had a slight positive skew, as it included extreme values that were outliers to the normal distribution. Given its W-statistic and p-value, the control group $(D = .161, p =$

$.141;\ W = .947, p = .272$) can be reasonably assumed to be normally distributed. The statistical power of the distribution is limited due to the sample size of the groups.

#### 4.2.1.2.2. Sub-Group Distributions

*Table 11. Pre-Test Sub-Groups Test of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Group Letter | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Pre-Test Section 1 Total | X | .269 | 10 | .039 | .860 | 10 | .077 |
| | Y | .227 | 8 | .200* | .818 | 8 | .044 |
| | Z | .218 | 10 | .195 | .889 | 10 | .164 |
| | θ | .193 | 12 | .200* | .921 | 12 | .291 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The findings of the K-S and S-W tests indicate that the subgroups have non-parametric distributions. The statistical power of the results is limited due to the small sample size of each subgroup. Given the non-normality of the subgroups, especially Groups X and Y, the subsequent analyses of subgroup differences should adopt non-parametric testing procedures, such as a Kruskal-Wallis test (Cohen et al., 2018; Dornyei, 2007).

### 4.2.1.3. Post-Test

#### 4.2.1.3.1. Two-Sample Distributions

*Table 12. Post-Test Two-Sample Test of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Group Type | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Post-Test Section 1 Overall Results | Experimental | .178 | 18 | .137 | .916 | 18 | .108 |
| | Control | .152 | 22 | .200* | .968 | 22 | .657 |
| *. This is a lower bound of the true significance. | | | | | | | |
| a. Lilliefors Significance Correction | | | | | | | |

Assessing the normality of post-test receptive abilities, the S-W test results indicate approximate normality for the experimental group $(\mathrm{W} = .916, \mathrm{p} = .108)$ and a convincing normal distribution for the control group $(\mathrm{W} = .968, \mathrm{p} = .657)$.

### 4.2.1.3.2. Sub-Group Distributions

*Table 13.Post-Test Sub-Group Tests of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Group Letter | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Post-Test Section 1 Total | X | .129 | 10 | .200* | .967 | 10 | .865 |
| | Y | .220 | 8 | .200* | .900 | 8 | .287 |
| | Z | .245 | 10 | .092 | .911 | 10 | .287 |
| | θ | .170 | 12 | .200* | .960 | 12 | .784 |
| *. This is a lower bound of the true significance. | | | | | | | |

a. Lilliefors Significance Correction

The above tests of normality support the assumption that the section 1 post-test results are normally distributed within each subgroup (Table 13), although the small sample size of each subgroup limits the statistical power of the finding.

#### 4.2.1.4. Delayed Post-Test

##### 4.2.1.4.1. Two-Sample Distributions

*Table 14. Delayed Post-Test Two-Sample Tests of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | Group Type | Statistic | df | Sig. | Statistic | df | Sig. |
| Delayed Post-Test Section 1 Total | Experimental | .132 | 18 | .200* | .926 | 18 | .168 |
| | Control | .201 | 22 | .021 | .934 | 22 | .147 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The tests of normality for the delayed post-test section 1 scores indicate a normal distribution for the experimental group and an approximate normal distribution for the control group.

#### 4.2.1.4.2. Sub-Group Distributions

*Table 15. Delayed Post-Test Sub-Group Tests of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Group Letter | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Delayed Post-Test Section 1 Results | X | .194 | 10 | .200* | .926 | 10 | .408 |
| | Y | .185 | 8 | .200* | .898 | 8 | .275 |
| | Z | .197 | 10 | .200* | .889 | 10 | .164 |
| | θ | .201 | 12 | .193 | .917 | 12 | .262 |
| *. This is a lower bound of the true significance. | | | | | | | |
| a. Lilliefors Significance Correction | | | | | | | |

With all p-values >0.05, the delayed post-test section 1 scores for all subgroups are consistent with a supposition of normal distribution (Table 15).

#### 4.2.1.5. Receptive Skills Normality Overview

*Table 16. Receptive Skills Tests of Normality Summary*

| Receptive Skills Tests of Normality Summary | | |
|---|---|---|
| **Test Stage** | **Two-Sample Distribution** | **Sub-Group Distribution** |
| **Pre-Test** | Parametric | Non-Parametric |
| **Post-Test** | Parametric | Parametric |

| | | |
|---|---|---|
| **Delayed Post-Test** | Parametric | Parametric |

The tests of normality for the section 1 results return one case of non-parametric results from the data set (Table 16). The pre-test results when analysed according to sub-group are unfit for parametric testing. The consistent parametric results for the experimental and control groups suggests that paired sample t-tests are pragmatic for the subsequent data analyses.

## 4.3. Productive Skills

### 4.3.1. Productive Skills Ordinate Group Balance

*Table 17. Two-Sample Group Types x Gender Crosstabulation*

| Two-Sample Group Types * Gender Crosstabulation | | | | | |
|---|---|---|---|---|---|
| | | Gender | | N | Percent (%) |
| | | F | M | | |
| Group Type | Experimental | 10 | 7 | 17 | 45.90 |
| | Control | 9 | 11 | 20 | 54.10 |
| Total | | 19 | 18 | 37 | 100.00 |

*Table 18. Two-Sample Group Types x English Proficiency Crosstabulation*

| Two-Sample Group Types * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | Total |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Group Type | Experimental | 7 | 0 | 9 | 1 | 17 |

| | | | | | |
|---|---|---|---|---|---|
| **Control** | 9 | 1 | 10 | 0 | 20 |
| **Total** | 16 | 1 | 19 | 1 | 37 |

*Table 19. Sub-Group x Gender Crosstabulation*

| Sub-Group * Gender Crosstabulation | | | | | |
|---|---|---|---|---|---|
| | | Gender | | Total | Percent (%) |
| | | F | M | | |
| Sub-Group | X | 6 | 4 | 10 | 27.03 |
| | Y | 4 | 3 | 7 | 18.92 |
| | Z | 4 | 6 | 10 | 27.03 |
| | θ | 5 | 5 | 10 | 27.03 |
| Total | | 19 | 18 | 37 | 100.00 |

*Table 20. Sub-Group x English Proficiency Crosstabulation*

| Sub-Group * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | Total |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Sub-Group | X | 5 | 0 | 4 | 1 | 10 |
| | Y | 2 | 0 | 5 | 0 | 7 |
| | Z | 5 | 0 | 5 | 0 | 10 |
| | θ | 4 | 1 | 5 | 0 | 10 |
| Total | | 16 | 1 | 19 | 1 | 37 |

Following the eligibility analysis, which removed $N = 3$ participants that did not consent to the recording of audio, the productive skills section of the study had $N = 37$ participants.

### 4.3.2. Spontaneous Speech

#### 4.3.2.1. Attrition

*Table 21. Two-Sample Group Types x Gender Crosstabulation*

**Two-Sample Group Types * Gender Crosstabulation**

| | | Gender | | N | Percent (%) |
|---|---|---|---|---|---|
| | | F | M | | |
| Group Type | Experimental | 9 | 7 | 16 | 51.61 |
| | Control | 8 | 7 | 15 | 48.39 |
| Total | | 17 | 14 | 31 | 100.00 |

*Table 22. Two-Sample Group Types x English Proficiency Crosstabulation*

**Two-Sample Group Types * English Proficiency (Self-Rating) Crosstabulation**

| | | English Proficiency (Self-Rating) | | | | Total |
|---|---|---|---|---|---|---|
| | | Beginner | Fluent | Intermediate | Proficient | |
| Group Type | Experimental | 7 | 0 | 8 | 1 | 16 |
| | Control | 4 | 1 | 10 | 0 | 15 |
| Total | | 11 | 1 | 18 | 1 | 31 |

*Table 23. Sub-Group x Gender Crosstabulation*

**Sub-Group * Gender Crosstabulation**

| | | Gender | | Total | Percent (%) |
|---|---|---|---|---|---|
| | | F | M | | |
| Sub-Group | X | 5 | 3 | 8 | 25.80 |
| | Y | 4 | 3 | 7 | 22.60 |
| | Z | 4 | 4 | 8 | 25.80 |
| | θ | 4 | 4 | 8 | 25.80 |
| Total | | 17 | 14 | 31 | 100.00 |

*Table 24. Sub-Group x English Proficiency Crosstabulation*

| Sub-Group * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | Total |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Sub-Group | X | 4 | 0 | 3 | 1 | 8 |
| | Y | 2 | 0 | 5 | 0 | 7 |
| | Z | 3 | 0 | 5 | 0 | 8 |
| | θ | 2 | 1 | 5 | 0 | 8 |
| Total | | 11 | 1 | 18 | 1 | 31 |

To maintain consistency in the dataset, the participants who did not upload a file for at least one of the spontaneous speech tasks have been removed from the following analysis. Each normality test for the spontaneous speech dataset reports the results of $N = 31$ participants, which is a 20% attrition rate from the ordinate productive skills participant cohort.

#### 4.3.2.2. Pre-Test

#### 4.3.2.2.1. Two-Sample Distributions

**Tests of Normality**

| Test | Group Type | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Pre-Test Spontaneous Speech Scores | Experimental | .282 | 16 | .001 | .786 | 16 | .002 |
| | Control | .234 | 15 | .027 | .838 | 15 | .012 |
| Post-Test Spontaneous Speech Scores | Experimental | .169 | 16 | .200* | .914 | 16 | .136 |
| | Control | .186 | 15 | .174 | .890 | 15 | .067 |
| Delayed Post-Test Spontaneous Speech Scores | Experimental | .181 | 16 | .169 | .874 | 16 | .032 |
| | Control | .164 | 15 | .200* | .888 | 15 | .063 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

#### 4.3.2.2.2. Sub-Group Distributions

*Table 25. Sub-Group Tests of Normality*

**Tests of Normality**

| Test | Sub-Group | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pre-Test Spontaneous Speech Scores** | **X** | .359 | 8 | .003 | .693 | 8 | .002 |
| | **Y** | .228 | 7 | .200* | .853 | 7 | .132 |
| | **Z** | .252 | 8 | .143 | .847 | 8 | .088 |
| | **θ** | .257 | 8 | .127 | .823 | 8 | .051 |
| **Post-Test Spontaneous Speech Scores** | **X** | .158 | 8 | .200* | .947 | 8 | .682 |
| | **Y** | .275 | 7 | .117 | .891 | 7 | .280 |
| | **Z** | .263 | 8 | .108 | .916 | 8 | .395 |
| | **θ** | .171 | 8 | .200* | .918 | 8 | .410 |
| **Delayed Post-Test Spontaneous Speech Scores** | **X** | .155 | 8 | .200* | .908 | 8 | .338 |
| | **Y** | .232 | 7 | .200* | .902 | 7 | .341 |
| | **Z** | .189 | 8 | .200* | .919 | 8 | .423 |
| | **θ** | .208 | 8 | .200* | .884 | 8 | .204 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### 4.3.2.2.3. Spontaneous Speech Distribution Summary

*Table 26. Spontaneous Speech Tests of Normality Summary*

| **Spontaneous Speech (Section 2C) Tests of Normality Summary** | | |
|---|---|---|
| **Test Stage** | **Two-Sample Distribution** | **Sub-Group Distribution** |
| **Pre-Test** | Non-Parametric | Non-Parametric |
| **Post-Test** | Parametric or Non-Parametric | Parametric or Non-Parametric |

| | | |
|---|---|---|
| **Delayed Post-Test** | Non-Parametric | Parametric or Non-Parametric |

The tests of normality for the spontaneous speech results suggest a need for non-parametric testing procedures with the dataset (Table 26).

#### 4.3.2.3. Word Stress Production

##### 4.3.2.3.1. Attrition

*Table 27. Two-Sample Group Types x Gender*

| Two-Sample Group Types * Gender Crosstabulation | | | | | |
|---|---|---|---|---|---|
| | | Gender | | N | Percent (%) |
| | | F | M | | |
| Group Type | Experimental | 9 | 6 | 15 | 45.50 |
| | Control | 9 | 9 | 18 | 54.50 |
| Total | | 18 | 15 | 33 | 100.00 |

*Table 28. Two-Sample Group-Types x English Proficiency*

| Two-Sample Group Types * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | N |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Group Type | Experimental | 6 | 0 | 8 | 1 | 15 |
| | Control | 7 | 1 | 10 | 0 | 18 |
| Total | | 13 | 1 | 18 | 1 | 33 |

*Table 29. Sub-Group x Gender*

| Sub-Group * Gender Crosstabulation | | | | | |
|---|---|---|---|---|---|
| | | Gender | | N | Percent (%) |
| | | F | M | | |
| Sub-Group | X | 5 | 3 | 8 | 24.20 |
| | Y | 4 | 3 | 7 | 21.20 |
| | Z | 4 | 4 | 8 | 24.20 |
| | θ | 5 | 5 | 10 | 30.30 |
| Total | | 18 | 15 | 33 | 100.00 |

*Table 30. Sub-Group x English Proficiency*

| Sub-Group * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | Total |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Sub-Group | X | 4 | 0 | 3 | 1 | 8 |
| | Y | 2 | 0 | 5 | 0 | 7 |
| | Z | 3 | 0 | 5 | 0 | 8 |
| | θ | 4 | 1 | 5 | 0 | 10 |
| Total | | 13 | 1 | 18 | 1 | 33 |

Participants who did not upload a recording for at least one of the word stress production tasks have been removed from the analysis. There are $N = 33$ participants in this dataset, which is a 10.81% attrition rate from the ordinate productive skills participant cohort.

#### 4.3.2.3.2. Word Stress Test of Normality

#### 4.3.2.3.2.1. Two-Sample Distributions

*Table 31. Word Stress Two-Sample Tests of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| Test | Group Type | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Pre-Test Word Stress Production Scores | Experimental | .118 | 15 | .200* | .971 | 15 | .866 |
| | Control | .203 | 18 | .049 | .903 | 18 | .065 |
| Post-Test Word Stress Production Scores | Experimental | .213 | 15 | .066 | .907 | 15 | .120 |
| | Control | .168 | 18 | .194 | .950 | 18 | .430 |
| Delayed Post-Test Word Stress Production Scores | Experimental | .244 | 15 | .017 | .888 | 15 | .062 |
| | Control | .135 | 18 | .200* | .956 | 18 | .521 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

These scores mandate the use of parametric testing procedures for subsequent analysis. The tests of normality indicate an ambiguous approximate normal distribution for the experimental group ($W = .888, p = .062$) and a normal distribution for the control group ($W = .956, p = .521$) in the delayed post-test. To clarify the distribution of the experimental group, reference will be made to a detrended normal Q-Q plot.

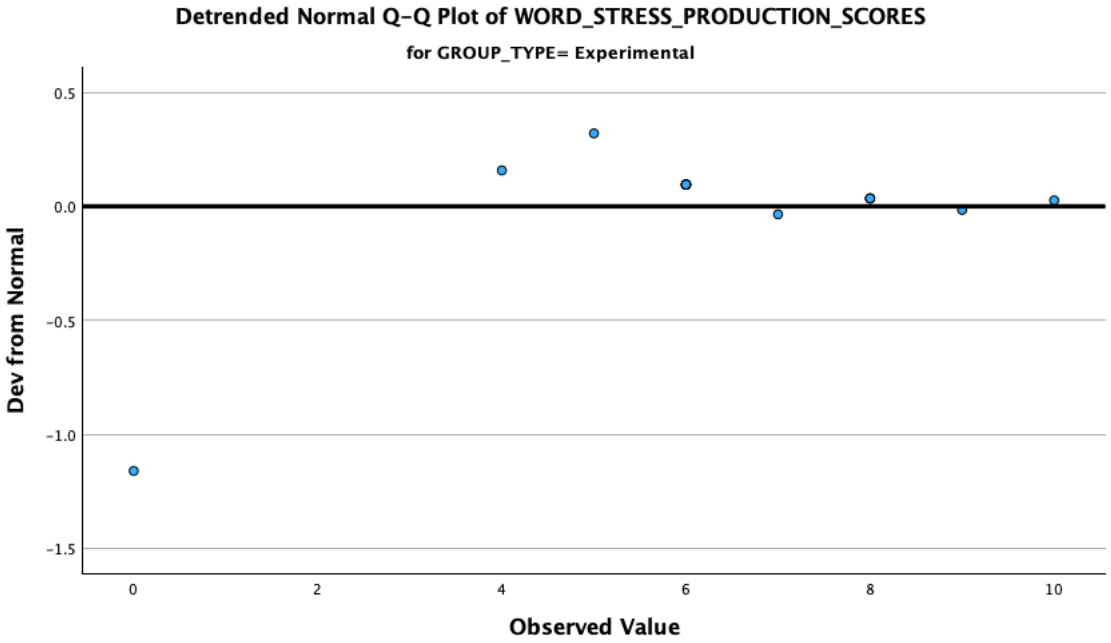



*Figure 1.Post-Test Word Stress Experimental Group Q-Q Plot*

The detrended normal Q-Q plot shows a normal distribution in the dataset, mitigated by an extreme outlier. The outlier is participant C18 of Group Y, who scored $N = 0$ on the test. Given the trend towards normality, the experimental group will be assumed to approximate normality. Parametric testing will, therefore, be plausible for the delayed post-test results.

### 4.3.2.3.2.2. Sub-Group Normality

*Table 32. Sub-Group Tests of Normality*

| Tests of Normality | | | | | | |
|---|---|---|---|---|---|---|
| | Sub-Group | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pre-Test Word Stress Production Scores** | **X** | .209 | 8 | .200* | .904 | 8 | .316 |
| | **Y** | .214 | 7 | .200* | .961 | 7 | .824 |
| | **Z** | .347 | 8 | .005 | .676 | 8 | .001 |
| | **θ** | .146 | 10 | .200* | .909 | 10 | .276 |
| **Post-Test Word Stress Production Scores** | **X** | .223 | 8 | .200* | .861 | 8 | .122 |
| | **Y** | .298 | 7 | .061 | .886 | 7 | .255 |
| | **Z** | .192 | 8 | .200* | .948 | 8 | .690 |
| | **θ** | .153 | 10 | .200* | .969 | 10 | .882 |
| **Delayed Post-Test Word Stress Production Scores** | **X** | .241 | 8 | .189 | .935 | 8 | .563 |
| | **Y** | .339 | 7 | .015 | .856 | 7 | .141 |
| | **Z** | .247 | 8 | .162 | .843 | 8 | .080 |
| | **θ** | .200 | 10 | .200* | .961 | 10 | .795 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### 4.3.2.3.2.3. Summary of Word Stress Production Score Distributions

*Table 33. Word Stress Production Score Normality Summary*

| **Word Stress Production Score Tests of Normality Summary** | | |
|---|---|---|
| **Test Stage** | **Two-Sample Distribution** | **Sub-Group Distribution** |
| **Pre-Test** | Parametric | Non-Parametric |
| **Post-Test** | Parametric | Non-Parametric |
| **Delayed Post-Test** | Parametric | Non-Parametric |

The tests of normality for the word stress production results indicate the potential for parametric testing with the experimental and control groups and non-parametric testing with the sub-groups (Table 33).

#### 4.3.2.4. Stress-timed Speech Production

##### 4.3.2.4.1. Attrition

*Table 34. Two-Sample Group Types x Gender*

| Two-Sample Group Types * Gender Crosstabulation | | | | | |
|---|---|---|---|---|---|
| | | Gender | | *N* | Percent (%) |
| | | F | M | | |
| Group Type | Experimental | 9 | 7 | 16 | 48.50 |
| | Control | 8 | 9 | 17 | 51.50 |
| Total | | 17 | 16 | 33 | 100.00 |

*Table 35. Two-Sample Group Types x English Proficiency*

| Two-Sample Group Types * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | Total |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Group Type | Experimental | 7 | 0 | 8 | 1 | 16 |
| | Control | 7 | 1 | 9 | 0 | 17 |
| Total | | 14 | 1 | 17 | 1 | 33 |

*Table 36. Sub-Group x Gender*

| Sub-Group * Gender Crosstabulation |
|---|

| | | Gender | | Total | Percent (%) |
|---|---|---|---|---|---|
| | | F | M | | |
| Sub-Group | X | 5 | 4 | 9 | 27.30 |
| | Y | 4 | 3 | 7 | 21.20 |
| | Z | 3 | 4 | 7 | 21.20 |
| | θ | 5 | 5 | 10 | 30.30 |
| Total | | 17 | 16 | 33 | 100.00 |

*Table 37. Sub-Group x English Proficiency*

| Sub-Group * English Proficiency (Self-Rating) Crosstabulation | | | | | | |
|---|---|---|---|---|---|---|
| | | English Proficiency (Self-Rating) | | | | Total |
| | | Beginner | Fluent | Intermediate | Proficient | |
| Sub-Group | X | 5 | 0 | 3 | 1 | 9 |
| | Y | 2 | 0 | 5 | 0 | 7 |
| | Z | 3 | 0 | 4 | 0 | 7 |
| | θ | 4 | 1 | 5 | 0 | 10 |
| Total | | 14 | 1 | 17 | 1 | 33 |

Participants who did not upload a recording for at least one of the stress-timed production tasks have been removed from the analysis. There has been a 10.81% attrition rate from the ordinate productive skills participant cohort.

#### 4.3.2.4.2. Two-Sample Distributions

*Table 38. Stress-timed Production Two-Sample Tests of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Group Type | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Pre-Test Stress-timed Speech Scores | Experimental | .145 | 16 | .200* | .869 | 16 | .027 |
| | Control | .242 | 17 | .009 | .793 | 17 | .002 |
| Post-Test Stress-timed Speech Scores | Experimental | .136 | 16 | .200* | .958 | 16 | .623 |
| | Control | .162 | 17 | .200* | .914 | 17 | .116 |
| Delayed Post-Test Stress-timed Speech Scores | Experimental | .255 | 16 | .007 | .840 | 16 | .010 |
| | Control | .188 | 17 | .112 | .872 | 17 | .024 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### 4.3.2.4.3. Sub-Group Normality

*Table 39. Sub-Group Tests of Normality*

| Tests of Normality | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Sub-Group | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| | X | .155 | 9 | .200* | .924 | 9 | .427 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pre-Test Stress-timed Speech Scores** | **Y** | .214 | 7 | .200* | .864 | 7 | .164 |
| | **Z** | .264 | 7 | .149 | .787 | 7 | .031 |
| | **θ** | .305 | 10 | .009 | .779 | 10 | .008 |
| **Post-Test Stress-timed Speech Scores** | **X** | .130 | 9 | .200* | .963 | 9 | .826 |
| | **Y** | .243 | 7 | .200* | .903 | 7 | .348 |
| | **Z** | .260 | 7 | .166 | .792 | 7 | .034 |
| | **θ** | .214 | 10 | .200* | .886 | 10 | .154 |
| **Delayed Post-Test Stress-timed Speech Scores** | **X** | .171 | 9 | .200* | .929 | 9 | .474 |
| | **Y** | .371 | 7 | .004 | .680 | 7 | .002 |
| | **Z** | .249 | 7 | .200* | .877 | 7 | .215 |
| | **θ** | .276 | 10 | .030 | .846 | 10 | .051 |

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

### 4.3.2.4.4. Summary of Stress-Timed Speech Production Score Distributions

*Table 40. Stress-timed Production Normality Summary*

| **Stress-timed Production Tests of Normality Summary** | | |
|---|---|---|
| **Test Stage** | **Two-Sample Distribution** | **Sub-Group Distribution** |
| **Pre-Test** | Non-Parametric | Non-Parametric |
| **Post-Test** | Parametric or Non-Parametric | Non-Parametric |
| **Delayed Post-Test** | Non- Parametric | Non-Parametric |

The tests of normality for the stress-timed speech production results posit the need for non-parametric testing with the experimental and control groups and the sub-groups (Table 40).

## 4.4. Effect Sizes

### 4.4.1. Receptive Skills

#### 4.4.1.1. Experimental Group Paired-Sample T-Tests

*Table 41. Experimental Group Report on Means*

| Experimental Group Report on Means | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Mean** | 5.17 | 7.33 | 7.11 |
| **N** | 18 | 18 | 18 |
| **Std. Deviation** | 2.572 | 2.635 | 3.879 |

*Table 42. Experimental Group Paired Samples T-Test*

| Experimental Group Paired Samples Test | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Paired Differences | | | | | | |
| | **Mean** | **Std. Deviation** | **Std. Error Mean** | **Significance** | | **t** | **Cohen's d** |
| | | | | **One-sided p** | **Two-sided p** | | |
| **Pre-Test x Post-Test** | -2.167 | 2.706 | .638 | .027 | .055 | -3.397 | 0.83 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pre-Test x Delayed Post-Test** | -1.944 | 3.686 | .869 | .048 | .096 | -2.238 | 0.59 |
| **Post-Test x Delayed Post-Test** | .222 | 3.059 | .721 | .003 | .006 | .308 | 0.07 |

Paired t-tests within the experimental group yield a large effect size from pre-test to post-test $(d = 0.83, p = 0.055)$ and a moderate effect size from pre-test to delayed post-test $(d = 0.59, p = 0.096)$ (Cohen, 1988). Neither result meets the $p < 0.05$ standard for statistical significance when referring to the two-sided p-value, although the results approach significance (Table 42).

#### 4.4.1.2. Control Group Paired Sample T-Tests

*Table 43. Control Group Report on Means*

| Control Group Report on Means | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Mean** | 6.00 | 6.32 | 6.73 |
| **N** | 22 | 22 | 22 |
| **Std. Deviation** | 2.976 | 3.257 | 3.269 |

*Table 44. Control Group Paired Sample T-Tests*

| Control Group Paired Samples Test | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Paired Differences | | | | | | |
| | Mean | Std. Deviation | Std. Error Mean | Significance | | t | Cohen's d |
| | | | | One-sided p | Two-sided p | | |
| **Pre-Test x Post-Test** | -.318 | 2.885 | .615 | .003 | .005 | -.517 | 0.10 |
| **Pre-Test x Delayed Post-Test** | -.727 | 3.042 | .649 | .006 | .011 | -1.121 | 0.23 |
| **Post-Test x Delayed Post-Test** | -.409 | 2.501 | .533 | <.001 | <.001 | -.767 | 0.13 |

Following conventional effect size standards (Cohen, 1988), the paired t-tests within the control group return a negligible effect size from pre-test to post-test $(d = 0.10, p = 0.005)$ and post-test to delayed post-test $(d = 0.13, p < 0.001)$ for the receptive skills results (Table 44). There was a small effect size from pre-test to delayed post-test $(d = 0.23, p = 0.011)$. Both results meet the $p < 0.05$ standard for statistical significance when referring to the two-sided p-value.

#### 4.4.1.3. Independent Sample T-Tests

*Table 45. Independent Samples Group Statistics*

| Group Statistics | | | | | | |
|---|---|---|---|---|---|---|
| | **Group Type** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** | **Cohen's d** |
| **Pre-Test** | **Experimental** | 18 | 5.17 | 2.572 | .606 | 0.30 |
| | **Control** | 22 | 6.00 | 2.976 | .635 | |
| **Post-Test** | **Experimental** | 18 | 7.33 | 2.635 | .621 | 0.34 |
| | **Control** | 22 | 6.32 | 3.257 | .694 | |
| **Delayed Post-Test** | **Experimental** | 18 | 7.11 | 3.879 | .914 | 0.11 |
| | **Control** | 22 | 6.73 | 3.269 | .697 | |

*Table 46. Independent Samples T-Test*

| Independent Samples Test | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Levene's Test for Equality of Variances** | | **t-test for Equality of Means** | | | |
| | | **F** | **Sig.** | **t** | **df** | **Significance** | |
| | | | | | | **One-Sided p** | **Two-Sided p** |
| **Pre-Test** | **Equal variances assumed** | 1.065 | .309 | -.936 | 38 | .178 | .355 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Equal variances not assumed** | | | -.950 | 37.863 | .174 | .348 |
| **Post-Test** | **Equal variances assumed** | 1.450 | .236 | 1.067 | 38 | .146 | .293 |
| | **Equal variances not assumed** | | | 1.090 | 37.999 | .141 | .283 |
| **Delayed Post-Test** | **Equal variances assumed** | .056 | .814 | .340 | 38 | .368 | .736 |
| | **Equal variances not assumed** | | | .334 | 33.373 | .370 | .741 |

The independent t-test results indicate that there were no statistically significant differences between groups at each receptive skills test stage, as all tests returned a p-value $> 0.05$ (Table 46). The baseline results were approximately similar at the pre-test.

#### 4.4.1.4. Kruskal-Wallis Test

*Table 47. Kruskal-Wallis Test Ranks*

| **Kruskal-Wallis Test Ranks** | | | |
|---|---|---|---|
| | **Sub-Group** | ***N*** | **Mean Rank** |
| **Pre-Test** | **X** | 10 | 16.65 |
| | **Y** | 8 | 20.94 |

| | | | |
|---|---|---|---|
| | **Z** | 10 | 20.90 |
| | **θ** | 12 | 23.08 |
| | **Total** | 40 | |
| **Post-Test** | **X** | 10 | 21.65 |
| | **Y** | 8 | 23.38 |
| | **Z** | 10 | 23.50 |
| | **θ** | 12 | 15.13 |
| | **Total** | 40 | |
| **Delayed Post-Test** | **X** | 10 | 21.35 |
| | **Y** | 8 | 20.19 |
| | **Z** | 10 | 23.60 |
| | **θ** | 12 | 17.42 |
| | **Total** | 40 | |

*Table 48. Kruskal-Wallis Test Statistics*

| **Test Statistics[a,b]** | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Kruskal-Wallis H** | 1.719 | 3.859 | 1.613 |
| **df** | 3 | 3 | 3 |
| **Asymp. Sig.** | .633 | .277 | .656 |
| $\eta^2$ | 0.04 | 0.10 | 0.04 |
| a. Kruskal Wallis Test | | | |
| b. Grouping Variable: Sub-Group | | | |

The Kruskal-Wallis test results indicate no statistically significant differences across sub-groups, as the asymptotic significance values all exceed 0.05 (Table 48).

### 4.4.2. Productive Skills

#### 4.4.2.1. Spontaneous Speech

##### 4.4.2.1.1 Mann-Whitney U Test

*Table 49. Mann-Whitney U Test Ranks*

| Mann-Whitney U Test Ranks | | | | |
|---|---|---|---|---|
| | **Group Type** | ***N*** | **Mean Rank** | **Sum of Ranks** |
| **Pre-Test** | **Experimental** | 16 | 15.31 | 245.00 |
| | **Control** | 15 | 16.73 | 251.00 |
| | **Total** | 31 | | |
| **Post-Test** | **Experimental** | 16 | 15.72 | 251.50 |
| | **Control** | 15 | 16.30 | 244.50 |
| | **Total** | 31 | | |
| **Delayed Post-Test** | **Experimental** | 16 | 17.00 | 272.00 |
| | **Control** | 15 | 14.93 | 224.00 |
| | **Total** | 31 | | |

*Table 50. Mann-Whitney U Test Statistics*

| Mann-Whitney U Test Statistics[a] | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Mann-Whitney U** | 109.000 | 115.500 | 104.000 |
| **Wilcoxon W** | 245.000 | 251.500 | 224.000 |
| **Z** | -.441 | -.179 | -.635 |
| **Asymp. Sig. (2-tailed)** | .659 | .858 | .525 |
| **Exact Sig. [2*(1-tailed Sig.)]** | .682[b] | .861[b] | .545[b] |
| **a. Grouping Variable: Group Type** | | | |
| **b. Not corrected for ties.** | | | |

The Mann-Whitney U Test yields no statistically significant differences between experimental and control groups for the spontaneous speech tests $(all\ p > 0.05)$ (Tables 50).

#### 4.4.2.1.2. Kruskal-Wallis Test

*Table 51. Spontaneous Speech Kruskal-Wallis Test Ranks*

| Spontaneous Speech Kruskal-Wallis Test Ranks | | | |
|---|---|---|---|
| | **Sub-Groups** | ***N*** | **Mean Rank** |
| **Pre-Test** | **X** | 8 | 17.06 |
| | **Y** | 7 | 13.43 |
| | **Z** | 8 | 12.44 |
| | **θ** | 8 | 20.75 |
| | **Total** | 31 | |

| | | | |
|---|---|---|---|
| **Post-Test** | **X** | 8 | 15.81 |
| | **Y** | 7 | 13.79 |
| | **Z** | 8 | 19.69 |
| | **θ** | 8 | 14.44 |
| | **Total** | 31 | |
| **Delayed Post-Test** | **X** | 8 | 20.69 |
| | **Y** | 7 | 14.21 |
| | **Z** | 8 | 15.69 |
| | **θ** | 8 | 13.19 |
| | **Total** | 31 | |

*Table 52. Spontaneous Speech Kruskal-Wallis Test Statistics*

| **Spontaneous Speech Kruskal-Wallis Test Statistics[a,b]** | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Kruskal-Wallis H** | 4.195 | 2.001 | 3.197 |
| **df** | 3 | 3 | 3 |
| **Asymp. Sig.** | .241 | .572 | .362 |
| $\boldsymbol{\eta^2}$ | 0.13 | 0.06 | 0.11 |
| a. Kruskal Wallis Test | | | |
| b. Grouping Variable: Sub-Group | | | |

The results of the Kruskal-Wallis Test indicate no statistically significant difference for stress pattern accuracy in spontaneous speech on any of the tests (Tables 51-52). While the $\eta^2$ posits a moderate effect size for the post-test ($\eta^2 = 0.06, p = .572$) and

delayed post-test ($\eta^2 = 0.11, p = .362$), the non-significant p-values suggest the effect sizes are unreliable.

#### 4.4.2.2. Word Stress Production

##### 4.4.2.2.1. Experimental Group Paired T-Tests

*Table 53. Experimental Group Report on Means*

| Experimental Group Report on Means | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Mean** | 5.73 | 6.67 | 6.33 |
| **N** | 15 | 15 | 15 |
| **Std. Deviation** | 2.492 | 1.877 | 2.350 |

*Table 54. Experimental Group Paired Samples Test*

| Experimental Group Paired Samples Test | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Paired Differences | | | | | | |
| | **Mean** | **Std. Deviation** | **Std. Error Mean** | **Significance** | | **t** | **Cohen's d** |
| | | | | **One-sided p** | **Two-sided p** | | |
| **Pre-Test x Post-Test** | -.933 | 3.127 | .808 | .134 | .267 | -1.156 | 0.43 |
| **Pre-Test x** | -.600 | 2.098 | .542 | .143 | .287 | -1.108 | 0.25 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Delayed Post-Test** | | | | | | | |
| **Post-Test x Delayed Post-Test** | .333 | 2.350 | .607 | .296 | .591 | .549 | 0.16 |

The paired t-test for the experimental group's word stress production results returns a non-significant medium effect size from pre-test to post-test $(d = 0.43, p = 0.267)$, suggesting a positive short-term intervention effect on word stress accuracy (Table 54).

#### 4.4.2.2.2. Control Group Paired T-Tests

*Table 55. Control Group Report on Means*

| Control Group Report on Means | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Mean** | 7.28 | 7.22 | 6.78 |
| **N** | 18 | 18 | 18 |
| **Std. Deviation** | 1.487 | 1.555 | 1.665 |

*Table 56. Control Group Paired Samples Test*

| Control Group Paired Samples Test | | | | | | |
|---|---|---|---|---|---|---|
| | Paired Differences | | | | t | Cohen's d |
| | Mean | | Significance | | | |

| | | Std. Deviation | Std. Error Mean | One-sided p | Two-sided p | | |
|---|---|---|---|---|---|---|---|
| **Pre-Test x Post-Test** | .056 | 2.043 | .482 | .348 | .696 | .115 | 0.04 |
| **Pre-Test x Delayed Post-Test** | .500 | 2.036 | .480 | .251 | .503 | 1.042 | 0.32 |
| **Post-Test x Delayed Post-Test** | .444 | 1.854 | .437 | .085 | .170 | 1.017 | 0.27 |

The paired samples t-test returns a non-significant trend of slight decline for control group participants' word stress production accuracy over time (Table 56). None of the comparison were statistically significant ($p < 0.05$).

#### 4.4.2.2.3. Independent Sample T-Tests

*Table 57. Independent Sample Group Statistics*

| Group Statistics | | | | | | |
|---|---|---|---|---|---|---|
| | **Group Type** | ***N*** | **Mean** | **Std. Deviation** | **Std. Error Mean** | **Cohen's d** |
| **Pre-Test** | **Experimental** | 15 | 5.73 | 2.492 | .643 | 0.76 |
| | **Control** | 18 | 7.28 | 1.487 | .351 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Post-Test** | **Experimental** | 15 | 6.67 | 1.877 | .485 | 0.32 |
| | **Control** | 18 | 7.22 | 1.555 | .367 | |
| **Delayed Post-Test** | **Experimental** | 15 | 6.33 | 2.350 | .607 | 0.22 |
| | **Control** | 18 | 6.78 | 1.665 | .392 | |

*Table 58. Independent Samples Test*

| **Independent Samples Test** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **Levene's Test for Equality of Variances** | | **t-test for Equality of Means** | | | |
| | | **F** | **Sig.** | **t** | **df** | **Significance** | |
| | | | | | | **One-Sided p** | **Two-Sided p** |
| **Pre-Test** | **Equal variances assumed** | 2.794 | .105 | -2.204 | 31 | .018 | .035 |
| | **Equal variances not assumed** | | | -2.108 | 21.954 | .023 | .047 |
| **Post-Test** | **Equal variances assumed** | 2.317 | .138 | -.930 | 31 | .180 | .359 |
| | **Equal variances not assumed** | | | -.914 | 27.252 | .184 | .369 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Delayed Post-Test** | **Equal variances assumed** | .281 | .600 | -.635 | 31 | .265 | .530 |
| | **Equal variances not assumed** | | | -.615 | 24.611 | .272 | .544 |

The independent t-test results indicate a lack of similarity in the baseline measurement of the two samples for word stress production $(d = .76, p = .035)$ (Table 58), which undermines the validity of inferences regarding the intervention's effectiveness on word stress production.

#### 4.4.2.2.4. Kruskal-Wallis Test

*Table 59. Word Stress Production Kruskal-Wallis Test Ranks*

| **Word Stress Production Kruskal-Wallis Test Ranks** | | | |
|---|---|---|---|
| | **Sub-Groups** | ***N*** | **Mean Rank** |
| **Pre-Test** | **X** | 9 | 14.33 |
| | **Y** | 7 | 13.64 |
| | **Z** | 7 | 20.79 |
| | **θ** | 10 | 19.10 |
| | **Total** | 33 | |
| **Post-Test** | **X** | 9 | 17.33 |
| | **Y** | 7 | 13.00 |
| | **Z** | 7 | 18.64 |
| | **θ** | 10 | 18.35 |

| | | | |
|---|---|---|---|
| | **Total** | 33 | |
| **Delayed Post-Test** | **X** | 9 | 17.61 |
| | **Y** | 7 | 16.86 |
| | **Z** | 7 | 13.57 |
| | **θ** | 10 | 18.95 |
| | **Total** | 33 | |

*Table 60. Word Stress Production Kruskal-Wallis Test Statistics*

| **Word Stress Production Kruskal-Wallis Test Statistics[a,b]** | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Kruskal-Wallis H** | 3.174 | 1.654 | 1.370 |
| **df** | 3 | 3 | 3 |
| **Asymp. Sig.** | .366 | .647 | .713 |
| $\eta^2$ | 0.10 | 0.05 | 0.04 |
| **a. Kruskal Wallis Test** | | | |
| **b. Grouping Variable: Sub-Group** | | | |

The Kruskal-Wallis tests examining sub-group differences in word stress production over time yield small sub-group differences at the pre-test ($\eta^2 = 0.10, p = .366$), post-test ($\eta^2 = 0.05, p = .647$), and delayed post-test ($\eta^2 = 0.04, p = .713$) stages (Table 60).

### 4.4.2.3. Stress-timed Speech Production

#### 4.4.2.3.1. Mann-Whitney U Test

*Table 61. Mann-Whitney U Test Ranks*

| Mann-Whitney U Test Ranks | | | | |
|---|---|---|---|---|
| | **Group Type** | ***N*** | **Mean Rank** | **Sum of Ranks** |
| **Pre-Test** | **Experimental** | 16 | 15.16 | 242.50 |
| | **Control** | 17 | 18.74 | 318.50 |
| | **Total** | 33 | | |
| **Post-Test** | **Experimental** | 16 | 15.25 | 244.00 |
| | **Control** | 17 | 18.65 | 317.00 |
| | **Total** | 33 | | |
| **Delayed Post-Test** | **Experimental** | 16 | 16.72 | 267.50 |
| | **Control** | 17 | 17.26 | 293.50 |
| | **Total** | 33 | | |

*Table 62. Mann-Whitney U Test Statistics*

| Mann-Whitney U Test Statistics[a] | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Mann-Whitney U** | 106.500 | 108.000 | 131.500 |
| **Wilcoxon W** | 242.500 | 244.000 | 267.500 |
| **Z** | -1.064 | -1.009 | -.162 |
| **Asymp. Sig. (2-tailed)** | .287 | .313 | .871 |

| | | | |
|---|---|---|---|
| **Exact Sig. [2*(1-tailed Sig.)]** | .292[b] | .326[b] | .873[b] |
| a. Grouping Variable: Group Type | | | |
| b. Not corrected for ties. | | | |

The Mann-Whitney U Test returned no statistically significant difference at each time measurement ($p > .05$) (Table 62).

#### 4.4.2.3.2. Kruskal-Wallis Test

*Table 63. Stress-timed Speech Kruskal-Wallis Test Ranks*

| **Stress-timed Speech Kruskal-Wallis Test Ranks** | | | |
|---|---|---|---|
| | **Sub-Groups** | ***N*** | **Mean Rank** |
| **Pre-Test** | **X** | 9 | 15.39 |
| | **Y** | 7 | 14.86 |
| | **Z** | 7 | 16.14 |
| | **θ** | 10 | 20.55 |
| | **Total** | 33 | |
| **Post-Test** | **X** | 9 | 15.78 |
| | **Y** | 7 | 14.57 |
| | **Z** | 7 | 21.71 |
| | **θ** | 10 | 16.50 |
| | **Total** | 33 | |
| **Delayed Post-Test** | **X** | 9 | 14.72 |
| | **Y** | 7 | 19.29 |

| | | | |
|---|---|---|---|
| | **Z** | 7 | 13.00 |
| | **θ** | 10 | 20.25 |
| | **Total** | 33 | |

*Table 64. Stress-Timed Speech Kruskal-Wallis Test Statistics*

| **Stress-timed Speech Kruskal-Wallis Test Statistics[a,b]** | | | |
|---|---|---|---|
| | **Pre-Test** | **Post-Test** | **Delayed Post-Test** |
| **Kruskal-Wallis H** | 2.002 | 2.279 | 3.231 |
| **df** | 3 | 3 | 3 |
| **Asymp. Sig.** | .572 | .516 | .357 |
| $\eta^2$ | 0.06 | 0.07 | 0.10 |
| a. Kruskal Wallis Test | | | |
| b. Grouping Variable: Sub-Group | | | |

The Kruskal-Wallis Test yields no statistically significant differences between sub-groups at each time point when measuring stress-timed speech production (Table 64).

### 4.5. Regression Analyses

To answer RQ3, the following section reports the linear regression analyses that examine the relationship between test results and background variables. A general limitation of the below results is that they have not been tested for normality.

### 4.5.1. English Language Proficiency as a Predictor of Outcomes

*Table 65. Regression Model Summary*

| Model Summary | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** | **t** | **Sig.** |
| **1[b]** | .550[a] | .303 | .285 | 37.362 | 4.064 | <.001 |
| **2[c]** | .511[a] | .261 | .242 | 36.752 | 3.667 | <.001 |
| **3[d]** | .527[a] | .277 | .258 | 39.153 | 3.818 | <.001 |
| a. Predictors: (Constant), English Proficiency (Self-Report) | | | | | | |
| b. Dependent Variable: Pre-Test Overall Results | | | | | | |
| c. Dependent Variable: Post-Test Overall Results | | | | | | |
| d. Dependent Variable: Delayed Post-Test Overall Results | | | | | | |

The linear regression model summary indicates a moderate positive correlation between the three tests and self-reported language proficiency levels ($.511 \leq R \leq .550, p < .001$), with around one-third of the variance explained according to language proficiency ($R^2 = .277 - .303, p < .001$) (Table 65). All models have high statistical significance ($p < .001$).

#### 4.5.1.1. Comparison of Overall Means

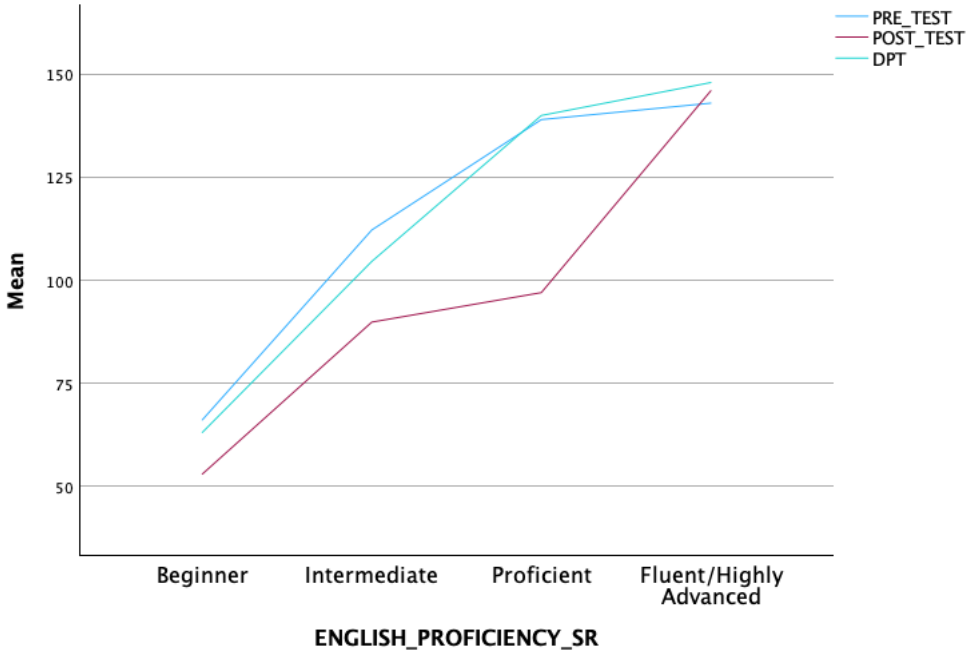



*Figure 2.English Proficiency x Overall Test Means*

A visualisation of the means from each test shows an approximate linear regression relationship with self-reported English proficiency (Figure 2).

### 4.5.2. Initial Prosodic Ability as a Predictor of Outcomes

#### 4.5.2.1. Pre-Test as a Predictor of Outcomes

*Table 66. Regression Model Summary*

| Model Summary[c] | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** | **t** | **Sig.** |
| **1[b]** | .801[a] | .642 | .632 | 25.593 | 8.252 | <.001 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2**[c] | .890[a] | .791 | .786 | 21.042 | 12.002 | <.001 |

a. Predictors: (Constant), Pre-Test

b. Dependent Variable: Post-Test

c. Dependent Variable: Delayed Post-Test

The linear regression analysis returns a strong correlation between the overall pre-test scores and both post-test $(R = .801, p < .001)$ and delayed post-test $(R = .890, p < .001)$ overall scores (Table 66).

#### 4.5.2.2. Comparison of Means




*Figure 3.Overall Pre-Test x Overall Test Means*

The comparison of means between pre-test overall results and subsequent overall test results indicates a variable positive relationship between outcomes (Figure 3). Both post-tests approximately correlate with the pre-test outcomes. The slightly higher results of the post-test could suggest a small intervention effect, although this interpretation relies on an unsupported assumption of normality.

### 4.5.3. Sociocultural Background as a Predictor of Outcomes

#### 4.5.3.1. Sociocultural Background and Overall Test Results

*Table 67.Regression Model Summary*

| Model Summary[d] | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | **R** | **R Square** | **Adjusted R Square** | **Std. Error of the Estimate** | **t** | **Sig.** |
| **1[b]** | .151[a] | .023 | -.004 | 44.064 | .927 | .360 |
| **2[c]** | .169[a] | .029 | .002 | 41.944 | 1.045 | .303 |
| **3[d]** | .217[a] | .047 | .022 | 45.176 | 1.355 | .184 |
| a. Predictors: (Constant), Parental Education | | | | | | |
| b. Dependent Variable: Pre-Test | | | | | | |
| c. Dependent Variable: Post-Test | | | | | | |
| d. Dependent Variable: Delayed Post-Test | | | | | | |

The linear regression analysis returns a weak correlation between parental education and overall pre-test ($R = .151, p = .360$), post-test ($R = .169, p = .303$), and delayed post-test ($R = .217, p = .184$) scores (Table 67). None of the results are statistically significant ($p > .05$).

### 4.5.3.2. Comparison of Regressions

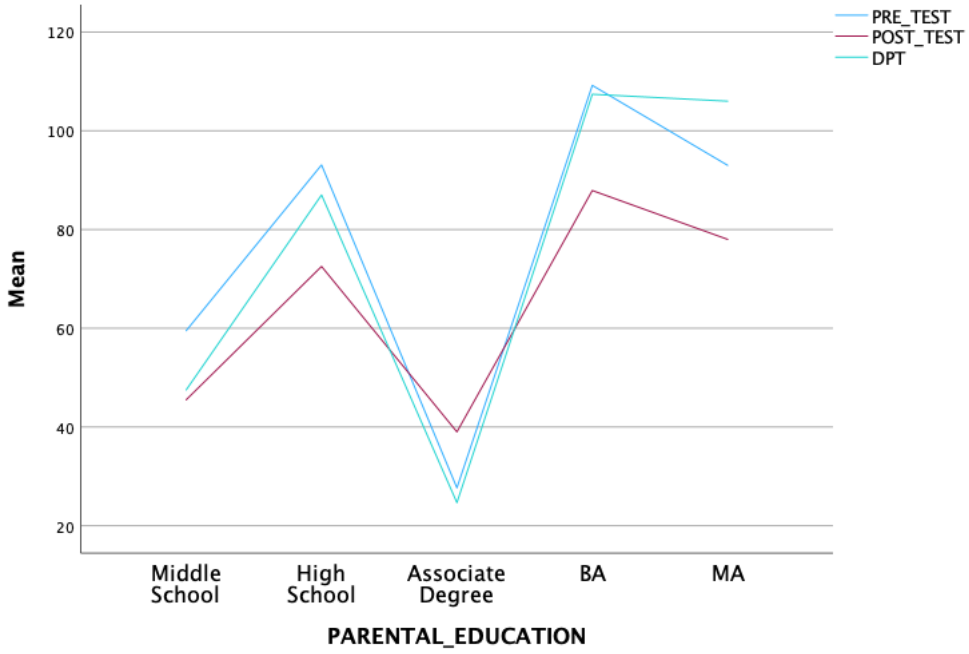



*Figure 4. Sociocultural Background x Overall Test Outcomes*

The chart comparing the overall test means to parental education supports the weak correlation finding of the linear regression analysis. The test results of participants with parents educated to the associate degree level $(N = 2)$ are a significant anomaly.

## 4.6. Participant Attitudes

To answer RQ4, experimental group participants gave feedback on their intervention lesson on an exit ticket that utilised Likert scales. A sample of participants $(N = 3)$ gave interviews to share their attitudes and beliefs towards the lesson and learning stress patterns. The section below reports the statistical findings of the feedback results and a thematic analysis of the interview transcripts.

### 4.6.1. How interesting was the lesson about stress patterns?

*Table 68. Exit Ticket - Interest in Experimental Lesson*

| Exit Ticket Feedback – Interest in Experimental Lesson | | |
|---|---|---|
| **Score** | **N** | **Percent %** |
| **1** | 0 | 00.00 |
| **2** | 0 | 00.00 |
| **3** | 0 | 00.00 |
| **4** | 9 | 50.0 |
| **5** | 8 | 44.40 |
| **Missing System** | 1 | 5.60 |
| **Total** | 18 | 100.00 |

The experimental group participants reported high levels of interest immediately after the intervention lesson (Table 68). The feedback of $N = 1$ participant was missing from the dataset. The positionality of the researcher as teacher of the participants may have moderated the authenticity of responses.

### 4.6.2. How useful was the lesson about stress patterns?

*Table 69. Exit Ticket - Perceived Usefulness of Experimental Lesson*

| Exit Ticket Feedback – Perceived Usefulness of Experimental Lesson | | |
|---|---|---|
| **Score** | **N** | **Percent (%)** |
| **1** | 0 | 00.00 |
| **2** | 0 | 00.00 |
| **3** | 2 | 11.10 |
| **4** | 5 | 27.80 |
| **5** | 10 | 55.60 |
| **Missing System** | 1 | 5.60 |
| **Total** | 18 | 100.00 |

Most experimental group participants perceived the intervention lesson as highly useful, with 83.40% scoring the utility at 4 or above (Table 69). A minority of participants $(11.10\%)$ reported neutrality towards the usefulness of the lesson. The feedback of $N = 1$ participant was absent from the dataset.

### 4.6.3. Thematic Analysis of Interview Transcripts

*Table 70. Interview Transcript Themes*

| Interview Transcript Themes | | | |
|---|---|---|---|
| **Theme** | **N** | **Coverage (%)** | **Selected Quotations** |
| **Exam Skills** | 2 | 4.98 | ***A13:*** *I want to learn more skills.*<br><br>***Interviewer:*** *And when you say skills, what kind of skills do you mean?*<br><br>***A13:*** *Err, exam skills.*<br><br>***Interviewer:*** *Right, okay, any skill that helps you to pass the test—*<br><br>***A13:*** *Yes.*<br><br>***Interviewer:*** *–Or to get a great score in a test is what you want to learn.*<br><br>***A13:*** *Yes. Yes.*<br><br>***Interviewer:*** *And do you feel like word stress does not help for—* |

| | | | |
|---|---|---|---|
| | | | ***A13:*** *–Just a little bit, because, though I know the pronunciation of one word, I can just like, err, know whether it is a noun or verb or not. Just only this.*<br><br>***Interviewer:*** *Right, okay, so I think you're saying that sometimes grammar is more helpful.*<br><br>***A13:*** *Yes.* |
| **Negativity towards Learning Stress Patterns** | 1 | 1.55 | ***Interviewer:*** *Do you think teachers should do this more in English class or talk about stress more often?*<br><br>***A13:*** *No. I think that we are going to the DSE. Just we should take more part in how to test, but not pronunciation.* |
| **Poetry Reading** | 4 | 6.80 | ***Interviewer:*** *Do you think that activity would be useful in class or something else? […]*<br><br>***A13:*** *I think reading a poem might be helpful.* |

| | | | |
|---|---|---|---|
| | | | ***Interviewer:*** *What activities do you think could help you, and your friends, with learning word stress?*<br><br>***B07:*** *Reading aloud the poem with partners.* |
| **Positivity towards Learning Stress Patterns** | 10 | 11.93 | ***A21:*** *After learning stress patterns in English, I learned some knowledge about how to speak pronunciation. I finally learned that, so I feel very approving about it.* |
| **Uncertain Attitude towards Learning Stress Patterns** | 2 | 5.65 | ***Interviewer:*** *Have you felt your English getting better after the practice of stress patterns?*<br><br>***A13:*** *Maybe.*<br><br>***Interviewer:*** *It's okay to say no.*<br><br>***A13:*** *No, I think it's maybe, because actually I speak Chinese more in daily life. So, actually, I have few chances to speak English in daily life. So, I can't just say that let me get better. I can't get the answer now.* |

| | | | |
|---|---|---|---|
| **Usefulness of Learning Stress Patterns** | 12 | 12.10 | ***Interviewer:*** *Do you think saying words with the stress patterns we have learned helps you speak better in English?*<br><br>***B07:*** *Yes. I think yes. Because this makes my speaking have more—richer—ups and downs.* |

A thematic analysis of the interviews with $N = 3$ participants found $N = 6$ themes that extrapolated beliefs and attitudes towards learning stress patterns (Table 70). While some themes, such as negativity $(coverage = 1.55\%)$ are weakly represented, comments from participants were insightful for understanding reasons for participant attitudes. The themes of positivity $(coverage = 11.93\%)$ and usefulness $(coverage = 12.10\%)$ in relation to learning stress pattern were prominent in the interviews. However, the positionality of the researcher as participant educator may moderate the reliability of these findings.

# 5. Discussion

## 5.1. RQ1

The effect sizes from the paired samples t-tests indicated a large short-term intervention effect for the experimental group for comprehending stress placement $(d = 0.83, p = .055)$. From pre-test to post-test, this finding approached statistical significance but did not meet the conventional $p < .05$ value. The delayed post-test evidenced medium-sized residual benefits from the intervention that approached statistical significance $(d = 0.59, p = .096)$. The control group, in contrast, had a statistically significant negligible improvement on the post-test $(d = 0.10, p = .005)$. The intervention effect for the experimental group is supported with a non-significant small effect size from the independent t-test $(d = 0.34, p = 0.293)$. The sub-group analysis further supports the short-term intervention effect with a medium effect size $(\eta^2 = 0.10, p = .277)$ from the Kruskal-Wallis test, although the validity of this causal inference is countered with the improvement of the placebo treatment sub-group on the post-test. It may be that participants focused on the post-test better when they perceived themselves to have an ongoing stake in the research project, as the performance of the no-treatment Group θ declined from the pre-test onwards. The findings mostly support the $H_1$ that stress patterns can be taught through explicit instruction: in this case, perception of stress patterns can be improved through raising awareness of them and practicing recognition through rules-based input, practice games, and performative poetry readings (Boldireff & Bober, 2022; Chen et al., 2025; Hancock, 1995). The intervention effect finding is approximately consistent with those of the Chen et al. (2025) and Yenkimaleki and van Heuven (2016). However, the p-value of the experimental group result risks a Type 1 error. Before rejecting the $H_0$, an enhanced study, with a larger sample size and expanded testing instrument, is needed to establish a statistically significant finding.

### 5.2. RQ2a

The results of the data analysis do not give a reliable indication of changes to stress pattern accuracy in the production of spontaneous speech among participants. All statistical significance results of the Mann-Whitney U Test and Kruskal-Wallis test did not meet the conventional standard of $p < 0.05$. While the mean of the experimental group improved on the delayed post-test, suggesting a possible long-term intervention effect, this finding is not statistically significant and is contradicted with the group's negligible improvement on the post-test. One limitation of the results is the inclusion of phonemic analysis in the marking procedure. This was originally for a potential error analysis but, ultimately, convoluted the outcomes for stress pattern accuracy in spontaneous speech. The validity of the findings could be enhanced through re-marking the spontaneous speech records to include stress pattern outcomes only. In a replication study, the reliability of results could be enhanced through achieving greater statistical power, preventing attrition, and conducting parametric tests.

### 5.3. RQ2b

The results of the paired t-test indicated a short-term intervention effect on word stress accuracy for the experimental group, although this post-test result is not statistically significant $(d = 0.43, p = .267)$. The moderate improvement in the post-test was not sustained in the delayed post-test $(d = 0.16, p = .591)$, suggesting that consistent practice over time may be needed to improve or maintain word stress accuracy. This would be a similar need to practicing tonal pronunciation over time as research has found for learners attempting to accurately pronounce the lexical tones of Mandarin Chinese (Hao, 2012; Lee et al., 2017). The lack of baseline equivalence $(d = 0.76)$, evident in the independent t-test, and attrition rate of 10.81% limits the validity of the findings for word stress accuracy. Further investigation of the question could increase statistical power with a larger sample size and extended testing instrument for more reliable results.

### 5.4. RQ2c

The Mann-Whitney U Test yielded unsubstantial and statistically non-significant changes in the accuracy of stress-timed speech production of the experimental and control groups. One reason for the lack of change may be the brevity of the intervention. The Kruskal-Wallis test indicated temporary improvements for Group Y on the delayed post-test and Group Z on the post-test, which could be further investigated with a granular analysis of the results sheets. As with the spontaneous speech results, the validity of the stress-timed speech production scores is limited due to the inclusion of phonemic analysis for the scoring. While this would have been useful for an errors analysis, the results need to be re-marked for a more precise representation of stress pattern accuracy in the dataset. A replication trial, therefore, should revise the marking procedure, such as by recording scores according to error type and ensuring inter-rater reliability, to enhance the validity of results.

### 5.5. RQ3a

The linear regression analysis returned a statistically significant moderate positive correlation between the mean overall scores of the word stress tests and the participants' self-reported English language proficiency $(.511 \leq R \leq .550,\ p < .001)$. The positive correlations and comparison of means (Figure 2) were consistent across tests, although there was a notable drop in the mean of the proficient participants on the post-test. This suggests that perception and production of stress patterns is moderately related to overall second language proficiency. One limitation of the finding is the small sample size of proficient $(N = 2)$ and fluent $(N = 1)$ participants. Moreover, the self-reported proficiency information was a second-measure datapoint for the study, and a validated rapid language test would have been preferable for measuring initial language proficiency (Lemhöfer & Broersma, 2012). Although the self-reported data was efficient to collect, a more reliable finding could have been established had the LexTale results been fully collected.

### 5.6. RQ3b

A linear regression analysis of the participants' overall pre-test scores had a strong and statistically significant correlation with overall post-test ($R = .801, p < .001$) and delayed post-test ($R = .890, p < .001$) results. The results of the post-test and delayed post-test could have, therefore, been approximately predicted based on the overall pre-test results. Synthesised with the moderate correlation finding on test results and language proficiency, the outcomes suggest there may be a relationship between accurate stress pattern perception and production and existing language proficiency. The RQ has not been completely answered, as the pre-test only measured stress pattern perception and production rather than overall prosodic ability. For a robust understanding of the relationship between prosodic abilities and stress pattern training, a comprehensive test of prosodic abilities would need to be conducted, such as with the PEPS-C assessment instrument (Fekar-Gharamaleki et al., 2019; Peppé & McCann, 2003).

### 5.7. RQ3c

According to Bourdieu's (1997) theory of cultural capital, parental education should predict competence in the perception and production of stress patterns. While not a statistically significant result, the linear regression analysis does not support this theory, as only a weak to small correlation was found between parental education and overall test scores ($.151 \leq R \leq .217,\ .184 \leq p \leq .360$). The test results of participants who had parents that completed an Associate's Degree ($N = 3$) were a significant anomaly. The lack of correlation may be due to the small sample size of the Associate Degree group. Goldthorpe (2007) has criticised the validity of Bourdieu's (1997) theory for underestimating the role that educational institutes can have in transmitting cultural capital, when compared to transmission from family or class influence. In a contemporary Hong Kong context, the role of popular culture and social media (Valiente-Neighbours, 2020) and shadow schooling (Chan & Bray, 2014) might also be posited as additional sociocultural factors that shape stress pattern perception and

production for young L2 English learners. These factors are unaccounted for in this analysis but may be explored in an alternative study of the RQ.

### 5.8. RQ4

The feedback from participants immediately after the experimental intervention lesson evidenced high interest in learning stress patterns through explicit instruction, with 44.4% of participants rating their interest at 4/5 and 50% rating their interest at 5/5. The participants generally perceived the lesson as useful: 27.8% rated the utility of the lesson at 4/5, while 55.6% rated utility of the lesson 5/5. 11.1% of participants returned a neutral rating of 3/5 for the utility of the lesson. The small sample size and positionality of the researcher as regular teacher at the school limits the reliability of the findings. Assuming the participants did not like the lesson as much as they reported, the positivity of students could have been based on a prosocial power dynamic with the teacher. Assuming authenticity of responses, the feedback data indicates strong approval of learning stress patterns in a Hong Kong L2 English classroom context.

The interview data indicated that student positivity towards learning stress patterns was partly based on the novelty of learning them and the perceived aesthetic qualities of stress-controlled speech production. In his interview, participant A21 stated “I finally learned [how to speak], so I feel approving about it.” (Interview 01, 28/02/2025) The lack of prior exposure to stress patterns in class seems to have added interest to the lesson. The theme of stress patterns being useful also arose, with participant B07 reporting that speaking with “ups and downs” added to the perceived richness of her speech production (Interview 03, 28/02/2025). While this belief may not integrate seamlessly with a focus on communicative competence that research suggests L2 educators prioritise in contexts that support intercultural cooperation (Young & Sachdev, 2011), it does suggest that students in the Hong Kong context can value speech style as a feature of language learning.

Participant A13 reported $N = 1$ negative reference to the learning of stress patterns. She cited the limited application to examination performance as a reason to not prioritise stress pattern development at the expense of examination practice. When asked whether stress patterns should be taught more often, A13 dissented and stated that “we should take more part in how to test, but not pronunciation.” (Interview 02, 28/03/2025) Her belief is consistent with research evidence suggesting that students in Confucian Heritage Cultures tend to place high-value on examination performance (Berry, 2011; Carless, 2012; Watkins, 2010).

# 6. Conclusion

## 6.1. Summary of Findings

Despite its ambitious design, the RCT found limited statistically significant information on the teachability of stress patterns. One result from the receptive skills data analysis approached statistical significance but did not achieve sufficient significance to reject the the $H_0$. Had the results met the conventional p-value, the finding would have asserted a medium-to-large causal relationship between the explicit instruction of stress patterns and stress perception for L2 English learners in Hong Kong $(.59 \leq d \leq .83)$. The productive skills data analyses returned non-significant information on the teachability of stress patterns for producing spontaneous speech, managing word stress, and delivering stress-timed poetry performances. The methodology for interpreting the development of stress pattern control in speech production could be refined to enhance outcomes, such as through developing a valid rubric for evaluating elements of speech production. Despite lacking significance and reliability, the data analysis suggested that the intervention had only a short-term medium-sized effect on word stress production and, otherwise, a negligible effect on spontaneous and stress-timed speech production.

The analysis of how background factors relate to stress pattern abilities returned a statistically significant finding that initial stress pattern abilities strongly correlated with post-intervention stress pattern abilities $(.801 \leq R \leq .890, p < .001)$. The finding indicates that prior, or existing, stress pattern abilities predict those abilities over time. The analyses of English language proficiency and sociocultural background as correlates of stress pattern abilities did not return statistically significant findings. There was a moderate positive relationship between English language proficiency and stress pattern abilities, which was supported with an approximate linear regression of overall test means and English proficiency levels, although this finding needs further investigation to establish a reliable statistic. A general limitation on the validity of the background factor investigations is the lack of a test for normality.

The attitudes towards learning stress patterns were predominantly positive among participants. 94.40% experimental group participant reported interest in the intervention lesson, and 83.40% reported that they perceived the lesson as useful. The thematic analysis found novelty and appreciation for the sound of rhythmic speech as reasons for finding the stress pattern lesson useful. One interviewee reported believing that learning pronunciation skills was less important than developing examination skills, which is consistent with research evidence for student priorities in the Hong Kong context (Berry, 2011; Carless, 2012).

### 6.2. Pedagogical Implications

Given the general lack of statistical significance, educators should approach the evidence of the study with caution. The brief intervention indicated without statistical significance that stress perception and word stress production can be enhanced through explicit instruction, and so there may be value in delivering lessons that use rules-based input, stress pattern practice activities, and poetry performances for developing those skills. In the context of Hong Kong, students seem to find the topic of stress patterns interesting and useful and may find application for these skills in poetry performances. However, curriculum designers weighing the necessity of developing these abilities in the Hong Kong context should take into consideration young learner attitudes towards examination demands, which can moderate the sense of importance students feel towards learning supra-segmental speech skills.

### 6.3. Recommendations for Further Research

This study attempted to test the $H_0$ that stress patterns are unteachable and had some success in developing a research design that could be fine-tuned to solve this conundrum. To fine-tune the design, researchers might increase statistical power with larger sample sizes, expanded testing instruments, and a longer intervention duration. The marking process for determining stress pattern accuracy in utterances could also incorporate an inter-rater reliability procedure and an analysis per error type to

determine the extent to which features of speech, other than stress placement, inhibit oracy in speech performances.

As this research attempted to follow up on the research gaps found in the meta-analysis of Lee et al. (2014), there would be value in furthering investigation into how background variables shape stress pattern skills. Besides replicating the study to achieve a result with statistical significance, the investigation into how sociocultural factors correlate with stress pattern abilities could be refined. This study relied on parental education as an indicator of cultural capital, which does not account for the potential moderating effect of background variables such as media access, type of education institution, and shadow schooling in the Hong Kong context. A study focusing on this RQ could broaden the variables for investigation to understand the role background factors have in shaping stress pattern development.

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# Appendices

## Appendix A

[redacted]

**Participant Background Data Survey**
背景數據調查

Thank you for participating in our research study. Your responses to the following questions will provide valuable background information that will help us better understand our participants. Please answer each question to the best of your ability.
感謝您參與我哋嘅研究。 你對以下問題嘅回答將提供有價值嘅個人資料，將有助於我哋更好咁了解我哋嘅參與者。 請盡您所能回答每個問題。

| **1. Personal Information 個人資料** | | | |
|---|---|---|---|
| **Age** 年齡 | 16 [ ] | 17 [ ] | 18 [ ] Other 其他 [ ] |
| **Gender** 性別 | Male 男 [ ] | Female 女 [ ] | Other 其他 [ ] |
| **2. Education 教育背景** | | | |
| **What Form are you in?** 你喺邊個班級？ | Form 5 中五 [ ] | | Other 其他 [ ] |
| **Are you DSE English student?** 你係 DSE 英文學生啊？ | Yes 是 [ ] | | No 不 [ ] |

**3. Parental Education 家長教育水平**

Please tick the highest level of education that either of your parents have ATTAINED.

請勾選您父母任何一方所達到的最高教育水平。

| | | |
|---|---|---|
| High School | 高中 | [ ] |
| Associate's Degree | 二年制學位 | [ ] |
| Bachelor's Degree | 學士學位 | [ ] |
| Master's Degree | 碩士學位 | [ ] |
| Doctorate/Ph.D. | 博士學位 | [ ] |
| Other | 其他 | [ ] |

If other, please specify (請說明): _____

1

[redacted]







| **4. Language Proficiency 語言能力** | |
|---|---|
| **What is your first language?**<br>你的母語是什麼？ | Cantonese 粵語 [ ] Mandarin 普通话 [ ]<br>English 英文 [ ] Other 其他 [ ]<br>If other, please specify:<br>_____ |
| **What other languages do you speak?**<br>您仲識講哪些其他語言？ | Cantonese 粵語 [ ] Mandarin 普通话 [ ]<br>English 英文 [ ] Other 其他 [ ]<br>If other, please specify:<br>_____ |
| **How would you rate your proficiency in English?**<br>您如何評價自己的英語能力？ | Fluent 流利 [ ]<br>Proficient 精通 [ ]<br>Intermediate 中級 [ ]<br>Beginner 初學者 [ ] |
| **5. Ethnicity 種族** | |
| **Are you Hong Kong Chinese?**<br>您是中國香港人嗎？ | Yes 是 [ ] No 不 [ ] |
| **If you answered 'No' above, please state your ethnicity:**<br>如果您說“不”，请說明您的種族： | |
| **6. Additional Comments 附加意見** | |
| **Is there anything else you would like us to know about you as a participant in this study? Please feel free to share any additional information here.**<br>作為本研究的參與者，你是否有任何其他想告訴我們的事項？請隨意在此分享任何額外信息。 | |
| | |
| Your responses are confidential and will only be used for research purposes. Thank you for taking the time to provide this important background data.<br>你的回答會是保密的，僅供研究用途。感謝你抽出時間提供這些重要的背景資料。 | |

## Appendix B



**Oxford University Research Project**

**The Pronunciation Workshop**

**Examination 1 of 3**

**Class:** _____ **Class Number:** _____ **Date:** 17th February 2025

**Time allowed:** 50 minutes **Score:** / 100

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***Instructions***

There are 3 sections in this examination. Complete all of the tasks in each section.

*Section 1 – Listening (8 minutes)*

In section 1, the examiner will play an audio track. Listen and respond to the audio to complete the tasks.

*Section 2 – Speaking (10 minutes)*

For section 2, use your recording device to record your voice. You should upload your recording at the end of the examination.

*Section 3 – Performance (15 minutes)*

For section 3, use the iPad on your desk to record yourself reading aloud. You should upload your recording at the end of the examination.

*Completion – Uploading Examination Files (17 minutes)*

When you have finished recording, name your file with your class and class number (e.g. 5E 01). Follow the directions on the screen to upload your file.

**Section 1A – Listening**

*You will hear audio for the words below. Listen to the audio. Identify the stress pattern in the word. Tick the box for the word with the correct stress pattern underlined.*

1. content

   A. content ☐ B. content ☐ C. content ☐ D. content ☐

2. invent

   A. invent ☐ B. invent ☐ C. invent ☐ D. invent ☐

3. compose

   A. compose ☐ B. compose ☐ C. compose ☐ D. compose ☐

4. insert

   A. insert ☐ B. insert ☐ C. insert ☐ D. insert ☐

5. decrease

   A. decrease ☐ B. decrease ☐ C. decrease ☐ D. decrease ☐

6. update

   A. update ☐ B. update ☐ C. update ☐ D. update ☐

7. export

   A. export ☐ B. export ☐ C. export ☐ D. export ☐

8. rebate

   A. rebate ☐ B. rebate ☐ C. rebate ☐ D. rebate ☐

9. contract

   A. contract ☐ B. contract ☐ C. contract ☐ D. contract ☐

10. reject

    A. reject ☐ B. reject ☐ C. reject ☐ D. reject ☐

**Section 1B – Listening**

*You will hear audio for the sentences below. Listen to each sentence. Identify the stress pattern for the underlined word. Tick one box for the word with the stressed syllable correctly underlined (A, B, or C).*

1. My favourite subject is probably geography.

   A. geography ☐ B. geography ☐ C. geography ☐

2. I love to visit places that have natural scenery.

   A. natural ☐ B. natural ☐ C. natural ☐

3. Moreover, I would say photography is one of my favourite activities.

   A. photography ☐ B. photography ☐ C. photography ☐

4. I enjoy taking pictures of ordinary scenes that most people might not even notice.

   A. ordinary ☐ B. ordinary ☐ C. ordinary ☐

5. One time, I snapped a fisherman at the beach.

   A. fisherman ☐ B. fisherman ☐ C. fisherman ☐

**Section 2 – Speaking**

**A) Read aloud the following words with the stress on the first syllable only. Record your voice when reading aloud.**

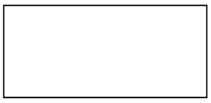
1. object
2. rebel
3. deport
4. record
5. product

**B) Read aloud the following words with the stress on the second syllable only. Record your voice when reading aloud.**

1. conflict
2. invent
3. recount
4. decrease
5. produce

**C) Answer the following question. Your answer should be around 1 minute in total. Record your voice when answering.**

*How do you get to school in the morning?*



**Section 3 – Performance**

**Read aloud the following poem. Record your voice when reading aloud.**

***The Pig***

*In England once there lived a big*

*And wonderfully clever pig.*

*To everybody it was plain*

*That Piggy had a massive brain.*

*He worked out sums inside his head,*

*There was no book he hadn't read,*

*He knew what made an airplane fly,*

*He knew how engines worked and why.*

*He knew all this, but in the end*

*One question drove him round the bend:*

*He simply couldn't puzzle out*

*What LIFE was really all about.*

*What was the reason for his birth?*

*Why was he placed upon this earth?*

*His giant brain went round and round.*

*Alas, no answer could be found,*

*Till suddenly one wondrous night,*

*All in a flash, he saw the light.*

*He jumped up like a ballet dancer*

*And yelled, "By gum, I've got the answer!"*

Source: *'Dirty Beasts' by Roald Dahl, 1984.*

| Score | | |
|---|---|---|
| Section 1 | A | / 10 |
| | B | / 5 |
| Section 2 | A | / 5 |
| | B | / 5 |
| | C | / 25 |
| Section 3 | | /50 |
| Total | | / 100 |

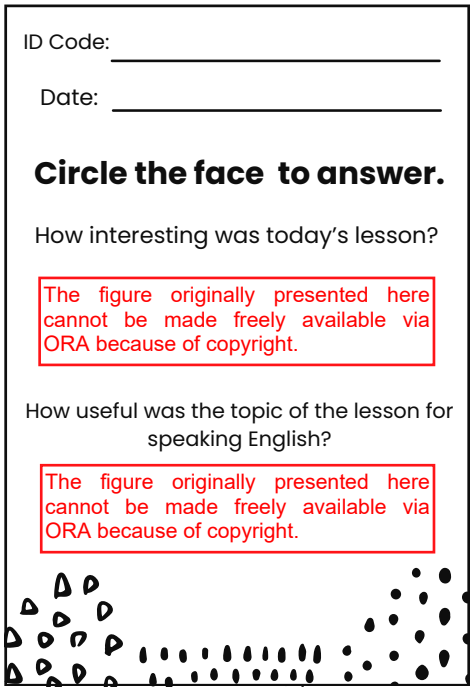
## Appendix C

ID Code: _____

Date: _____

**Circle the face to answer.**

How interesting was today's lesson?




How useful was the topic of the lesson for speaking English?

# Appendix D

Oxford University Research Project Interview Transcripts

**Interview 01 with A21**
28 February 2025

Interviewer: Good afternoon [redacted].

A21: Good afternoon.

Interviewer: Thank you for joining the lesson on Wednesday. It was great to have you there. And for joining our interview today, thank you very much. Okay. I am going to ask you some questions to understand your attitudes towards the things we learned in the lesson. Is that okay?

A21: Yeah.

Interviewer: So, the first question is how do you feel about learning stress patterns in English?

A21: After learning stress patterns in English, I learned some knowledge about how to speak pronunciation. I finally learned that, so I feel very approving about it. Yeah.

Interviewer: That's great. I'm glad you had a positive, approving feeling. And do you think it is useful to learn stress patterns when you speak English?

A21: Erm, I think it's very useful, as I can try to speak smoothly and I can easily to communicate with others. Yeah.

Interviewer: Yes, that's great, it might help with some, err-giving a clear meaning when you're trying to speak, I think it could be a very positive thing. When you tried to learn stress patterns on Wednesday, or before at school, have you found anything difficult about that?

A21: I always see the English word, I am very nervous, and I don't know how to speak it. So–but, after learning this, this puzzle [prostᵊl], I learned how to speak correctly, and also I can speak it smoothly. Yeah.

Interviewer: Okay, great. I hope that some of the things we learned can help you feel more relaxed and comfortable when speaking in English.

A21: Yeah.

Interviewer: Do you think saying words with stress patterns that we learned helps you to speak better? We learned some different stress patterns with the fishing game. Is that something you might use in the future?

A21: Yeah, I think it's very useful, so in the future I will communicate with others, and always using– talking by English, so I think it's very useful. Yeah.

Interviewer: Do you think what we learned has helped your stress patterns get any better?

A21: Mmm, I think also the pronunciation, because I learned how to speak the English within [roughly], so I can say it comfortable, also each others can clearly hear it.

Interviewer: Fantastic. Okay. I know we only had one session to practice it. Hopefully, in the future, if there's a chance to do more, err, it would be a great way to, err, help you get that rhythm when you're speaking. How do you practice saying words with stress in English? Is there something that you do in your lessons at school, or something you picked up from the [Wednesday] workshop, or something you picked up at home, err, that helps you practice saying words with stress?

A21: Because, nowadays, on the internet have many information, and, like, English video or movie, then I can watch it– I can always watch it. So, I will learn many English from this internet things, stuff. Yeah.

Interviewer: Great, yeah. That's one of the great things about the internet now. It makes English so accessible.

A21: Yeah.

Interviewer: Do you think teachers should try to talk more about the way speakers use stress patterns in the lesson?

A21: Yes, I think it's very important, because English is very useful, and, also, it's an international language; so, I think it's very important for me to learn English in the lesson. So, yeah.

Interviewer: Can activities in your class help you to learn which stress in English? Was there any activity from Wednesday that you thought was useful?

A21: I think, because many students are very nervous or lonely, because they have no their friends, or someone to stay with them to speak, so I think we can help more discussion, which include friends, teachers, or students to speak together. And, also, we can do some English project, also can through the speaking or communication to do it. Yeah.

Interviewer: Ah, a project sounds like a great idea, yeah. I'm sure that in your English lessons that might be a good way to use and practice with word stress.

A21: Yeah.

Interviewer: And a good way to work as a team too, to make some friends.

A21: Yeah.

Interviewer: Last question here is 6b. What activities might we also say can help us, and our friends, learning stress patterns?

A21: Also, we also can watch more and listen more. Also, we can have some study tour to go overseas to interact with others who are fluent in English. Also, it can enhance our English skills. Yeah.

Interviewer: Great, yeah, I think that would be a great way to make some friends, interact with people with different types of English, and we might learn new things. I think that's a great idea [redacted]. I really appreciate you sparing some time to do this interview. I am going to turn off the recording now.

A21: Okay, thank you.

Interviewer: Thank you very much.

**Interview 02 with A13**
28 February 2025

Interviewer: [redacted] good afternoon.

A13: Good afternoon.

Interviewer: Thank you very much for meeting with me today, and also for coming to the lesson on Wednesday. It's okay for us to have a discussion now about the lesson and the things you learned in the class, right?

A13: Yes.

Interviewer: Great, I have a question for us to begin: how do you feel about learning stress patterns in English?

A13: Err, I think it's interesting, because I haven't learned it before and—yeah.

Interviewer: So, it's something new?

A13: Yes. I've got to learn it. I think it's useful. Just I can use it into my maybe test or another way.

Interviewer: That's good. Yeah, I'm hoping that the lessons can be helpful for you when you have your DSE discussions, or some other activity where you can speak.

A13: Hmm.

Interviewer: So, why do you think it is useful to learn stress patterns when you speak English?

A13: Err, I think learning that can let me win speaking English. Can be more authentic. Yeah.

Interviewer: So, you like to sound like native-speakers of—what kind of English would you like to learn?

A13: Can you repeat?

Interviewer: You would like to learn to speak, like, what kind of English? Anything authentic?

A13: Yes. Maybe British English.

Interviewer: Right. So, British English would be something – a style of English you would like to learn.

A13: Yes.

Interviewer: I think if you study British English, word stress might be helpful to understand what some people are saying.

A13: Yes.

Interviewer: Err, have you found it difficult to learn stress patterns?

A13: A little.

Interviewer: How so?

A13: Just sometimes, I can tell that where the stress is, but, when I just find which part of it, sometimes I can't actually find what part is it.

Interviewer: Right, okay. I'm interested to understand how that is. I get the impression you have quite a good ear. Have you studied music before?

A13: Yes.

Interviewer: Do you think that helped you sometimes listening?

A13: Maybe.

Interviewer: Okay. That's another question for another day.

A13: Okay.

Interviewer: Do you think saying words with stress patterns that we learned helps you to speak better in English?

A13: Yes. The reason just seems like the question before.

Interviewer: To be authentic?

A13: Yes.

Interviewer: And maybe to sound like you have a British style accent?

A13: Yes.

Interviewer: And so, have you felt your English getting better after the practice of stress patterns?

A13: Maybe.

Interviewer: I appreciate you sharing your beliefs and attitudes.

**Interview 03 with B07**
28 February 2025

Interviewer: Good afternoon [redacted], thank you so much for joining me for an interview today. We're going to talk about some of the things you learned in the lesson on Tuesday. How do you feel about learning the content related to word stress?

B07: I think it's fun and easy to understand.

Interviewer: Okay, great. What were some of the fun things in the lesson?

B07: Uh.

Interviewer: We can come back to that question. Stay relaxed. It's okay. Do you think it is useful to learn stress patterns when speaking English?

B07: Yeah, because it can be applied in daily life.

Interviewer: When might you use stress patterns in daily life?

B07: For example, speaking exam.

Interviewer: Okay, yeah, maybe it will help you sound clear?

B07: Yes, fluently and clear.

Interviewer: Have you found it difficult to learn stress patterns?

B07: I think no. It's quite easy for it.

Interviewer: Do you think saying words with the stress patterns we have learned helps you speak better in English?

B07: Yes. I think yes. Because this makes my speaking have more—richer—ups and downs.

Interviewer: Great, have you felt your English getting better as you practice stress patterns?

B07: I think yes.

Interviewer: Well, your English is already quite clear, isn't it? Are you sure that it's been helpful to practice on—like we had on Tuesday?

B07: Yes.

Interviewer: So was there anything that was maybe helpful to understand or to learn that can improve your English?

B07: I have known more about some English things. Yeah.

Interviewer: Okay, let's move on to the next question. How do you practice saying words with stress in English?

B07: Have some poem or paragraph, and then just read aloud for it.

Interviewer: Great, great, and were there any activities in the lesson that could be helpful for practicing word stress?

B07: I think maybe a sentence or some of the poem and then give students to read out loud; and then if they have some mistake, teacher could told (sic) them. And then—to let them know where could be improved.

Interviewer: Okay, so getting feedback is really helpful. What did you think about the fishing game that we had? (Pause.) There was a fishing game where we matched the words—

B07: Oh!

Interviewer: Do you think that kind of practice is helpful? Solving puzzles like that for learning word stress?

B07: I think yes. It's quite fun for it.

Interviewer: Okay. Did you say it's fun?

B07: Yeah.

Interviewer: That's nice. Do you think teachers should talk more about word stress in English class?

B07: Yeah, because it can improve our English. And—Because I think maybe some students don't what is it, and they can't get it.

Interviewer: Right, okay, fantastic, so introducing word stress might help students, who don't know about it, understand it better.

B07: Yeah.

Interviewer: Can activities in class help you learn which stress to use in English?

B07: Yeah.

Interviewer: What activities do you think could help you, and your friends, with learning word stress?

B07: Reading aloud the poem with partners.

Interviewer: Okay, so you liked that activity that you had in class?

B07: Yeah.

Interviewer: Including performing it in front of the other students?

B07: (Hesitation.)

Interviewer: It's okay to say no.

B07: I think it's normal.

Interviewer: Normal. Okay. I feel like students can sometimes feel a little anxious or nervous—

B07: —But I like the part that, just, having the game part with my friends.

Interviewer: Okay, great, so some games that can help you practice word stress—they're good to have.

B07: Yeah.

Interviewer: Okay, that's really helpful [redacted]. Thank you so much for sharing your thoughts, your feelings about the lesson and word stress. I really appreciate it. I'm going to stop the recording. Thank you.

B07: Thank you.

## Appendix E



**Oxford University Research Project**

**The Pronunciation Workshop**

**Examination 2 of 3**

**Class:** _____ **Class Number:** _____ **Date:** 3rd March 2025

**Time allowed:** 50 minutes **Score:** / 100

---

***Instructions***

There are 3 sections in this examination. Complete all of the tasks in each section.

*Section 1 – Listening (8 minutes)*

In section 1, the examiner will play an audio track. Listen and respond to the audio to complete the tasks.

*Section 2 – Speaking (10 minutes)*

For section 2, use your recording device to record your voice. You should upload your recording at the end of the examination.

*Section 3 – Performance (15 minutes)*

For section 3, use the iPad on your desk to record yourself reading aloud. You should upload your recording at the end of the examination.

*Completion – Uploading Examination Files (17 minutes)*

When you have finished recording, name your file with your class and class number (e.g. 5E 01). Follow the directions on the screen to upload your file.

**Section 1A – Listening**

*You will hear audio for the words below. Listen to the audio. Identify the stress pattern in the word. Tick the box for the word with the correct stress pattern underlined.*

1. object

   A. object ☐ B. object ☐ C. object ☐ D. object ☐

2. record

   A. record ☐ B. record ☐ C. record ☐ D. record ☐

3. refuse

   A. refuse ☐ B. refuse ☐ C. refuse ☐ D. refuse ☐

4. produce

   A. produce ☐ B. produce ☐ C. produce ☐ D. produce ☐

5. present

   A. present ☐ B. present ☐ C. present ☐ D. present ☐

6. import

   A. import ☐ B. import ☐ C. import ☐ D. import ☐

7. permit

   A. permit ☐ B. permit ☐ C. permit ☐ D. permit ☐

8. rebel

   A. rebel ☐ B. rebel ☐ C. rebel ☐ D. rebel ☐

9. conflict

   A. conflict ☐ B. conflict ☐ C. conflict ☐ D. conflict ☐

10. contract

    A. contract ☐ B. contract ☐ C. contract ☐ D. contract ☐

**Section 1B – Listening**

*You will hear audio for the sentences below. Listen to each sentence. Identify the stress pattern for the underlined word. Tick one box for the word with the stressed syllable correctly underlined (A, B, or C).*

1. I sent the picture to a magazine called National Geographic.

   A. magazine ☐ B. magazine ☐ C. magazine ☐

2. To my surprise, the editor of the magazine accepted the picture.

   A. accepted ☐ B. accepted ☐ C. accepted ☐

3. Since then, I have started an Instagram for my natural photography.

   A. natural ☐ B. natural ☐ C. natural ☐

4. Last time I checked, I had several thousand followers, even my geography teacher.

   A. several ☐ B. several ☐ C. several ☐

5. If I carry on this way, I might become a journalist.

   A. journalist ☐ B. journalist ☐ C. journalist ☐

## Section 2 – Speaking

**A) Read aloud the following words with the stress on the first syllable.**

1. insult
2. convert
3. import
4. decrease
5. recess

**B) Read aloud the following words with the stress on the second syllable.**

1. compose
2. insert
3. subject
4. increase
5. permit

**C) Answer the following question. Your answer should be around 1 minute in total.**

*What food do you like to eat?*

**Section 3 – Performance**

**Read aloud the following poem.**

**The Ant-Eater**

*Some wealthy folks from U. S. A.,*
*Who lived near San Francisco Bay,*
*Possessed an only child called Roy,*
*A plump and unattractive boy –*
*Half-baked, half-witted, and half-boiled,*
*But worst of all, most dreadfully spoiled.*
*Whatever Roy desired each day,*
*His father bought him right away –*
*Toy motor-cars, electric trains,*
*The latest model aeroplanes,*
*A colour television-set,*
*A saxophone, a clarinet,*
*Expensive teddy-bears that talked,*
*And animals that walked and squawked.*
*That house contained sufficient toys*
*To thrill a half a million boys.*
*(As well as this, young Roy would choose,*
*Two pairs a week of brand-new shoes.)*
*And now he stood there shouting, "What*
*"On earth is there I haven't got?*
*"How hard to think of something new!*
*"The choices are extremely few!"*
*Then added, as he scratched his ear,*
*"Hold it! I've got a good idea!*
*"I think the next thing I must get*
*"Should be a most peculiar pet –*
"The kind that no one else has got –
"A giant ANT-EATER! Why not?"

Source: *'Dirty Beasts' by Roald Dahl, 1984.*

| Score | | |
|---|---|---|
| Section 1 | A | / 10 |
| | B | / 5 |
| Section 2 | A | / 5 |
| | B | / 5 |
| | C | / 25 |
| Section 3 | | /50 |
| Total | | / 100 |

## Appendix F



**Oxford University Research Project**

**The Pronunciation Workshop**

**Examination 3 of 3**

**Class:** _____ **Class Number:** _____ **Date:** 31st March 2025

**Time allowed:** 60 minutes **Score:** / 100

---

***Instructions***

There are 3 sections in this examination. Complete all of the tasks in each section.

*Section 1 – Listening (8 minutes)*

In section 1, the examiner will play an audio track. Listen and respond to the audio to complete the tasks.

*Section 2 – Speaking (10 minutes)*

For section 2, use your recording device to record your voice. You should upload your recording at the end of the examination.

*Section 3 – Performance (15 minutes)*

For section 3, use the iPad on your desk to record yourself reading aloud. You should upload your recording at the end of the examination.

*Completion – Uploading Examination Files (17 minutes)*

When you have finished recording, name your file with your class and class number (e.g. 5E 01). Follow the directions on the screen to upload your file.

**Section 1 – Listening**

*The examiner will play audio for the words below. Listen to the word. Identify the stress pattern in the word. Tick the box for the word with the correct stress pattern underlined.*

1. permit

   A. permit ☐ B. permit ☐ C. permit ☐ D. permit ☐

2. deport

   A. deport ☐ B. deport ☐ C. deport ☐ D. deport ☐

3. complex

   A. complex ☐ B. complex ☐ C. complex ☐ D. complex ☐

4. survey

   A. survey ☐ B. survey ☐ C. survey ☐ D. survey ☐

5. increase

   A. increase ☐ B. increase ☐ C. increase ☐ D. increase ☐

6. replay

   A. replay ☐ B. replay ☐ C. replay ☐ D. replay ☐

7. defect

   A. defect ☐ B. defect ☐ C. defect ☐ D. defect ☐

8. refund

   A. refund ☐ B. refund ☐ C. refund ☐ D. refund ☐

9. update

   A. update ☐ B. update ☐ C. update ☐ D. update ☐

10. invite

    A. invite ☐ B. invite ☐ C. invite ☐ D. invite ☐

**Section 1B – Listening**

*You will hear audio for the sentences below. Listen to each sentence. Identify the stress pattern for the underlined word. Tick one box for the word with the stressed syllable correctly underlined (A, B, or C).*

1. I frequently go to work on the light rail train.

   A. frequently ☐ B. frequently ☐ C. frequently ☐

2. The upside of commuting on the light rail is that it saves money.

   A. commuting ☐ B. commuting ☐ C. commuting ☐

3. The downside of being reliant on the light rail is that it can be late.

   A. reliant ☐ B. reliant ☐ C. reliant ☐

4. Truth be told, I am ambitious to learn to drive.

   A. ambitious ☐ B. ambitious ☐ C. ambitious ☐

5. I'll probably start learning to drive after I've finished learning Japanese.

   A. Japanese ☐ B. Japanese ☐ C. Japanese ☐

**Section 2 – Speaking**

**A) Read aloud the following words with the stress on the first syllable.**

1. update
2. conflict
3. rebate
4. insert
5. export

**B) Read aloud the following words with the stress on the second syllable.**

1. present
2. invent
3. record
4. import
5. object

**C) Answer the following question. Your answer should be around 1 minute in total.**

*What do you often do after school?*

**Section 3 – Performance**

**Read aloud the following poem.**

**The Cow**

*Please listen while I tell you now*

*About a most fantastic cow.*

*Miss Milky Daisy was her name,*

*And when, aged seven months, she came*

*To live with us, she did her best*

*To look the same as all the rest.*

*But Daisy, as we all could see*

*Had some kind of deformity,*

*A funny sort of bumpy lump*

*On either side, above the rump.*

*Now, not so very long ago,*

*These bumpy lumps began to grow,*

*And three or maybe four months later,*

*(I stood there, an enthralled spectator)*

*These bumpy lumps burst wide apart*

*And out there came (I cross my heart)*

*Of all the wondrous marvellous things*

*A pair of gold and silver wings!*

*A cow with wings! A flying cow!*

*I'd never seen one up to now.*

Source: *'Dirty Beasts' by Roald Dahl, 1984.*

| Score | | |
|---|---|---|
| Section 1 | A | / 10 |
| | B | / 5 |
| Section 2 | A | / 5 |
| | B | / 5 |
| | C | / 25 |
| Section 3 | | /50 |
| Total | | / 100 |

## Appendix G

**DEPARTMENT OF EDUCATION**
[redacted]
Department of Education, University of Oxford
15 Norham Gardens, Oxford, OX2 6PY
Phone: 01865 274024
[redacted]

[redacted]

**Research Project for Master of Science Degree at The University of Oxford:**
***On the Teachability of Word Stress: A Randomized Controlled Trial***
Ethics Approval Reference: EDUC_C1A_24_184

Dear Principal [redacted],

I am writing to request permission to conduct research with the Form 5 students at your school from [February] to [March] this year. As I believe you are aware, I am a Masters student at the University of Oxford. For my course, I will be conducting a self-funded applied linguistics research project. My research, which is entitled *On the Teachability of Word Stress: A Randomized Controlled Trial*, will explore the relationship between teaching lexical stress and its development as a pronunciation skill among research participants.

Given your consent for the project, the research will take place with approximately 104 students in Form 5. The participant number may change depending on student availability, although it is hoped that at least 80 students can join the project. For the research, I would like to teach after school intervention lessons for 2 weeks. In addition, I would like to conduct a series of proficiency and prosody tests with the participants. My research focus will be on the development of lexical stress among students according to different types of teaching input. An experimental group will receive direct instruction in word stress, while control groups will participate in assessments only or receive speech training in their extracurricular conversation classes.

By participating in the research, your school would be contributing to research that will clarify the teachability of stress patterns for language teachers and curriculum developers. The research will, furthermore, support best practices in training Hong Kong students for the DSE Oral English examination, the Hong Kong English Speech Festival Competition, and other English-based speech competitions internationally.

The commitment from the school would allow me to teach 6 after-school English lessons over 2 weeks and conduct approximately 3 language assessments with participants from February 2025 to March [2025]. These assessments would require the use of the school hall and IT equipment. For the assessments, students will be required to complete an online proficiency test and record their voices as part of a prosody test. Students who participate in the experimental group for the study will, furthermore, be surveyed on their attitudes towards learning stress patterns, and approximately 4 students will be interviewed to understand their attitudes towards learning this pronunciation skill. The recordings will subsequently be transcribed for data analysis. The research will only process data with the explicit permission of participants and the school.

The University of Oxford University has strict ethics procedures on conducting research with teachers and students, which are consistent with British Educational Research Association guidelines. Throughout the research, parents/guardians and students will be able to refuse to participate at any time.

All participants, including students, teachers, and the school, will be anonymised in all research reports. The data collected would be kept strictly confidential, available only to my supervisor and myself and not used other than specified without the further consent of all involved being obtained. All recordings will be destroyed at the end of the research period and kept in encrypted conditions until then. I have enclosed copies of the information for students with this letter.

If your school would like to take part in the study, or you need more information about what is involved, please contact me. Whether or not you feel it would be appropriate for your school to participate, I would be grateful if you would complete the attached form and return it to me at the email address [redacted]

Thank you for your time and attention. I look forward to hearing from you.

Yours sincerely,

[redacted]
Primary Researcher

**School Consent Form for the Research Project:**
***On the Teachability of Word Stress: A Randomized-Controlled Trial***

**Researchers**

[redacted]

**University Institution:** Department of Education, University of Oxford

**School Information**

**School Name:**
**School Address:** [redacted]

**School Administrator**

[redacted]

**School Statement of Consent**

*(To be completed by the School Principal)*

☐ We would like to take part in this project.

☐ We do not wish to participate in this project.

☐ We would like to find out more about this project.

**Signature:** _____ **Date:** _____

**School Contact**

If you would like further information, or are interested in taking part, please give the name of a contact person for your school, and details of the best way to contact them.

Contact name: _____

Contact email: _____

Contact telephone number: _____

**Researcher Contact**

[redacted]

*Thank you for your help and support.*

The last part of the **School Consent Form** *(School Statement of Consent)* presented here has been removed, as it cannot be made freely available via ORA for data protection purposes.

## Appendix H



**THE PRONUNCIATION WORKSHOP: A RESEARCH PROJECT**

**INFORMATION SHEET FOR PARTICIPANTS**

Central University Research Ethics Committee Approval Reference: EDUC_C1A_24_184

In partnership with researchers at The University of Oxford, your school has agreed to take part in a research study investigating the learning of English-speaking skills. We would like to invite you to be part of this research. We very much hope you would like to take part, but before you decide, it is important that you understand why the research is being done and what it will involve.

***Why is this research being conducted?***

Researchers do not completely understand how easy or difficult it is to learn some speaking skills in school. This project aims to better understand how well you can learn English speaking skills when you have lessons for them. To understand how you learn to improve your English speech and pronunciation, your teacher, Mr. [redacted], is going to give different lessons and compare the effects.

More information about the research can be obtained by contacting the research team (contact details overleaf).

***Why have I been invited to be involved in this research?***

We are inviting you to take part because you are a young person, aged from 16 to 18 years old, attending Carmel Bunnan Tong Memorial Secondary School, and you have Mr. [redacted] as your English teacher. At current numbers, we are inviting 104 young people to take part in the research.

***Do I have to be involved?***

No. You can ask questions about the research before deciding whether to participate. If you do agree to participate, you may withdraw yourself and your data, without giving a reason and without any effect on your education, by advising the school or researchers of this decision. The deadline by which you can withdraw any information you have contributed to the research is 31st March 2025. If you decide to withdraw, your data will be removed and erased from the project following a secure destruction procedure.

***What will happen if I take part?***

If you agree to take part in the research, we will ask you to:

- Participate in the research project from your joining date after 5th February 2025 to 2nd April 2025;
- Attend 3 assessment sessions with Mr. [redacted] from 12th February 2025 to 31st March 2025:
    - The 1st assessment will be a speech assessment in the school on 12th February 2025 and will last approximately 1 hour;

- The 2nd assessment will be a speech assessment on 3rd March 2025 lasting approximately 1 hour;
- The 3rd assessment will be a speech assessment on 31st March 2025, lasting approximately 1 hour;
- The above dates are subject to change, and you will be informed of any changes.

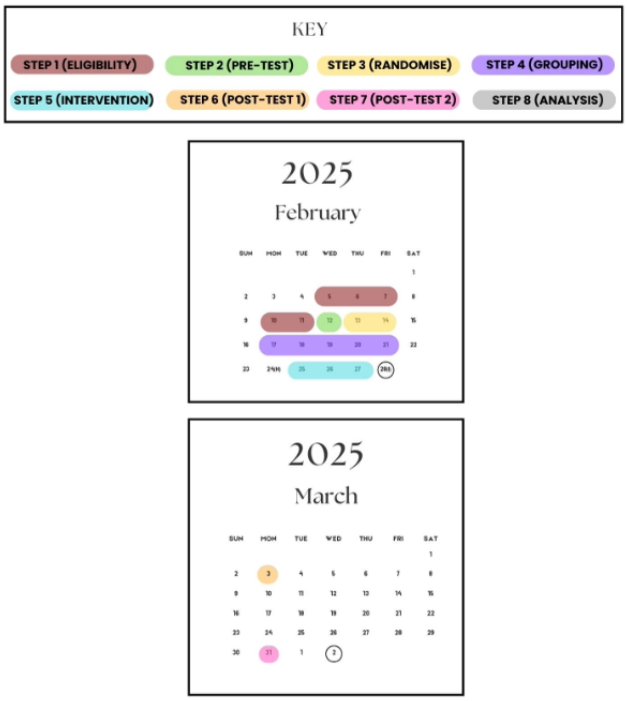
- Unless told otherwise, you must attend one after-school lesson with Mr. [redacted] between 25th February 2025 and 2nd April 2025.
  - You are expected to study diligently in the lessons and to follow the school's behaviour policy.
  - You may be asked to complete questionnaires and give feedback to the lessons.
  - You may be asked to attend an interview with Mr. [redacted] about your thoughts on the lesson content, which will require you to record your voice.
- To provide the following information to the study: age, gender, education background, parental education, languages known, English language proficiency level, and ethnicity.

***Do I need to tell my parent/guardian about the research?***

Following Hong Kong research guidelines, we will notify your parent/guardian about the research. If they do not want you to take part in the study, they have the option to remove you from the study. You are welcome to discuss your participation with your parent/guardian to help each other decide on your participation. If your parent/guardian does not want you to participate, your parent/guardian may sign an opt-out form by 31st March 2025 to exit you from the research project and erase your data from the research records.

***When will the research happen?***

The following is the current research schedule:



Starting from the 5th February 2025 to the 12th February 2025, you can join the project. You must complete an online proficiency test and a background survey to join the project. On the 12th February 2025, you can take a speaking test at your school. The test will have three parts. One part to test your listening, a second part to test your pronunciation, and a third part to test how you perform a poem. Between the 12th February 2025 and the 16th February 2025, Mr. [redacted] will mark the tests and choose who can be part of the project. From the 17th February 2025 to the 21st February 2025, Mr. [redacted] will place the approved students in groups. From the 25th February 2025 to the 27th February 2025, you can take part in classes after school with your group. Three groups will have different lessons to see how this affects their speaking. A fourth group will have a lesson on 2nd April 2025. On the 28th February 2025, you might be asked to have an interview with Mr. [redacted] about your lessons. The interviews aim to understand how you feel about what you have been learning and whether you think it is important. On the 3rd March 2025, you can take a second speaking test at your school. On the 31st March 2025, you will have a final speaking test at your school. From the 2nd April 2025, Mr. [redacted] will analyse and report what happened during the project.

***What are the possible disadvantages and risks in taking part?***

A potential disadvantage of taking part in the project includes strain or stress from the additional workload. You will receive support and advice if you experience any signs of mental illness or exhaustion during the project. Please report any health problems related to the project to Mr. [redacted].

If you are concerned about your data being identifiable for the project, please be assured that your data will not be identifiable during or after the research project. Your data will be anonymised and kept on a secure and encrypted server to minimize any risk to your information.

***Are there any benefits in taking part?***

While no benefits are guaranteed, it is hoped that your participation on the project will help you to develop your English speaking and pronunciation skills. This may potentially contribute to performance in the Hong Kong DSE, Hong Kong English Speech Festival, and the school's English speech activities.

***What information will be collected and why is the collection of this information relevant for achieving the research objectives?***

The following table specifies what types of data will be collected, where it will be kept, and why it is needed for the project:

| Data Type | Purpose of Collection |
|---|---|
| Consent records | To determine eligibility |
| Background information survey<br>*Including special category data, i.e. gender and ethnicity.* | To determine eligibility |
| Opt-out forms | To determine withdrawal or exemption from the project |
| Audio recordings from speaking examinations | To assess English speaking abilities |
| Audio recordings from interviews | To assess attitudes towards learning |
| Task performance data | To assess English speaking abilities and language proficiency |
| Transcripts of audio recordings | To record oral contributions to the project |

**Data Storage Notice:** All data will be stored on Oxford University's Nexus 365 OneDrive.

Consent data will be destroyed at the end of the research period and all participant data will be unidentifiable from that point on. Audio recordings will be destroyed once they have been transcribed and marked. Task performance data, audio transcripts, and background information will be stored for up to 3 years. After the storage period expires, the data will be securely destroyed. The data will be administered by the primary researcher and principal investigator. In the event of the researchers dissociating from their roles, another authorised person at Oxford University may manage the data. The researchers will anonymise the data through the anonymisation of participant information throughout the project. The researchers will retain consent forms only for as long as necessary and will destroy them at the end of the study. If the data becomes redundant or needs to be erased for any reason, then the data will be destroyed following a secure destruction procedure.

Researchers will ensure all other data collected in the research will be anonymised as soon as possible after collection. All data will be stored securely on an encrypted cloud server at The University of Oxford. The researcher and/or supervisor and/or another authorised personnel will maintain access to the research data. This may entail given permission to other researchers to check the collected data.

Summaries of the research findings will be given to the school and will be available to interested participants. The research will not identify the school, staff, or any students in any reports of the research.

***Will the research be published? Could I be identified from any publications or other research outputs?***

The findings from the research will be written up in a dissertation that will be submitted to The University of Oxford for assessment. The findings may be written for academic publication following the assessment. None of the research participants, including yourself, will be identifiable from the outputs. All data will be anonymous. The audio recordings you give to the project will be transcribed, and the audio files will be deleted.

A copy of the dissertation will be deposited both in print and online in the Oxford University Research Archive where it will be publicly available to facilitate its use in future research.

***Data Protection***

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the research.

The University will process your personal data for the purpose of the research outlined above. Research is a task that we perform in the public interest.

Further information about your rights with respect to your personal data is available from https://compliance.web.ox.ac.uk/individual-rights.

***Who has reviewed this research?***

This research has received ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee. (*Ethics reference: EDUC_C1A_24_184*)

***Who is organising and funding the research?***

The research is organised by Mr. [redacted] with his supervisor Dr. Anna-Maria Ramezanzadeh. Mr. [redacted] is self-funding the research.

***Who do I contact if I have a concern about the research, or I wish to complain?***

If you have a concern about any aspect of this research, please contact Mr. [redacted] ([redacted]), and we will do our best to answer your query. We will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the University of Oxford Research Governance, Ethics & Assurance (RGEA) team at rgea.complaints@admin.ox.ac.uk or on 01865 616480.

***What should I do next?***

Please fill in the enclosed form and return it to Mr. [redacted] if you would like to take part in this research. Please remember that you may withdraw at any time until 31st March 2025, without affecting your education and without giving a reason, by notifying the researcher.

***Further Information and Contact Details***

If you would like to discuss the research with someone beforehand (or if you have questions afterwards), please contact:

Mr. [redacted] (Primary Researcher)

Department of Education

Department of Education, University of Oxford

15 Norham Gardens, Oxford, OX2 6PY

Phone: 01865 274024

[redacted]

## Appendix I

[redacted]







**THE PRONUNCIATION WORKSHOP: A RESEARCH PROJECT**

### OPT-OUT FORM

Ethics Approval Reference: EDUC_C1A_24_184

If you **DO NOT** want your child to participate in the above-named research study please fill out the form below and return it to the school by 31/03/2025.

If we do not receive an opt-out form from you by this date, your child may choose to take part in this study, as described in the accompanying information sheet.

If you have no objection to your child participating in the study, you do not need to reply to this information.

---

**I, the undersigned, hereby DO NOT give permission for my child to take part in the study titled *The Pronunciation Workshop: A Research Project*.**

Name of child: _____

Name of parent/guardian: _____

Signature: _____ Date: _____

Name of researcher: _____

AP25_v4.0 Opt-out form

## Appendix J

[redacted]

**PARTICIPANT CONSENT FORM (GENERAL) 參與者同意書**

CUREC Approval Reference: EDUC_C1A_24_184

**THE PRONUNCIATION WORKSHOP: RESEARCH PROJECT**

- Your school has agreed to take part in a study run by the University of Oxford looking at how youths learn to speak English.
- If you take part, a researcher (Mr. [redacted]) will have 1 lesson and 3 examinations with you.
- To find out more about the study, please read the attached information sheet. You can e-mail us at [redacted] if you have any questions.
- **If you are <u>happy</u> to take part, please fill in the form below and return it to Mr. [redacted] as soon as possible.**

---

**English Name (英文名稱):** _____ _____

Forename(s) (名字) Surname (姓)

**Chinese Name (中文名稱):** _____ _____

Surname (姓) Forename(s) (名字)

**Name of school:** [redacted]

**Name of researcher:** <u>Mr. [redacted]</u>

I have read and understood the details of the above study and have had the opportunity to ask questions and discuss the study with others. I have received satisfactory answers to my questions. I understand that the project has received ethics clearance through the University of Oxford's ethical approval process for research involving human participants, and I understand who will have access to the data, how it will be stored and what will happen to the data at the end of the study. I understand that participation is voluntary and that I am free to withdraw at any time, without giving any reason and without my education being affected in any way. I understand how to raise a concern or make a complaint. 我有閱讀並理解上述研究的細節，並有機會提出問題並與他人討論研究。 我嘅問題得到咗滿意嘅答。 我知道該項目已通過牛津大學嘅倫理審批程序獲得咗涉及人類參與者嘅研究嘅倫理批准，並且我了解邊個將有權訪問數據、數據將如何存儲以及研究結束時數據會發生乜嘢。 我明白參與係自願嘅，我可以隨時退出，無需畀出任何理由，我嘅教育都唔會受到任何影響。我了解如何提出問題或投訴。

| | | |
|---|---|---|
| I agree to be audio recorded. 我同意錄音. | Yes (係) ☐ | No (不) ☐ |
| I understand how audio recordings will be used in research outputs. 我了解如何在研究成果中使用錄音. | Yes (係) ☐ | No (不) ☐ |

**I give permission to take part in the above study.** 我同意參加上述研究。

**Participant Signature:** _____ **Date:** dd / mm / yyyy

AP25 Consent Form

## Appendix K

**SOCIAL SCIENCES & HUMANITIES**
**INTERDIVISIONAL RESEARCH ETHICS COMMITTEE**
**DEPARTMENTAL RESEARCH ETHICS COMMITTEE**

Department of Education
15 Norham Gardens, Oxford OX2 6PY
student.curec@education.ox.ac.uk; staff.curec@education.ox.ac.uk

[redacted]
Department of Education, Social Sciences Division
University of Oxford

14 November 2024

Dear [redacted]

**Research ethics approval**

**Research title:** An investigation into the teachability of word stress: A randomised controlled trial

**Research ethics reference:** EDUC_C1A_24_184

The above application has been considered on behalf of the Education Departmental Research Ethics Committee (DREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to confirm that, on the basis of the information provided to the DREC, ethics approval has now been granted for this study.

Please note the following:

**Personal data**: It is the responsibility of the PI to ensure that all personal data collected during the project is managed in accordance with the University's guidance and legal requirements.

**In-person activities**: Any data collection involving in-person interactions with participants must have an up-to-date fieldwork risk assessment in place; further guidance is available from the Safety Office's website.

**Amendments**: Please notify the committee if you intend to make any amendments to the information in your ethics application as submitted at date of this approval, as all changes must receive ethical approval prior to implementation. The amendment form is available on the SSH IDREC webpage.

We welcome feedback on your experience of the ethical review process and suggestions for improvement. Please email any comments to staff.curec@education.ox.ac.uk / student.curec@education.ox.ac.uk or ethics@socsci.ox.ac.uk.

Yours sincerely,
Julia Badger
DREC member

cc: [redacted]; Research Management

**Subject:** Re: Update of Research Title (Ref: EDUC_C1A_24_184)
**Date:** Friday, 8 August 2025 at 1:17:20 PM British Summer Time
**From:** [redacted]
**To:** Research Management

Hi Mady,

Thank you for letting me know. Much appreciated!

Best regards,
[redacted]

**From:** Research Management <research.management@education.ox.ac.uk>
**Date:** Friday, 8 August 2025 at 11:52 AM
[redacted] Research Management <research.management@education.ox.ac.uk>
**Cc:** Adele Gregory <adele.gregory@education.ox.ac.uk>
**Subject:** RE: Update of Research Title (Ref: EDUC_C1A_24_184)

H[redacted]

Many thanks for letting us know. As this is a small title change, we're all good at our end.

Many thanks and best wishes,

Mady

[redacted]
**Sent:** 08 August 2025 11:29
**To:** Research Management <research.management@education.ox.ac.uk>
**Subject:** Update of Research Title (Ref: EDUC_C1A_24_184)

Dear Research Management,

I hope this message finds you well.

I am currently completing my MSc ALLT dissertation, and Adele Gregory, the course administrator, has informed me that the dissertation title should be identical to the title on my ethics approval letter. The title of my dissertation has been refined since I received the approval letter, and so I would like to share with you the final title so that the record can be updated.

**Ethics Reference Number:** EDUC_C1A_24_184
**Final Dissertation Title:** *On the Teachability of Stress Patterns: A Mixed-Methods Randomised Controlled Trial*

Adele noted that a new approval letter can be generated using WorkTribe; however, I believe I was one of the last applicants to complete the ethics process using an email application. Can you advise on how I can update the title on my ethics approval letter in absence of WorkTribe? (Is this achievable before the 13th August?)

Much appreciate your time and attention.

Best regards,

[redacted]

# Appendix L



| Lesson Designer: | [redacted] | Lesson Date(s): | 25/02/2025 & 26/02/2025 |
|---|---|---|---|

## Experimental Group Lesson Plan

**Context:**

This lesson is designed to train learners to recognise and produce accurate stress patterns when delivering a poem.
As part of randomised controlled trial, the participants have completed a pre-test that assessed their receptive and productive skills in relation to word stress.

**Overall Aim:**

By the end of this lesson, students will be better able to:

1. Recognise and use reduced syllables when making an utterance.
2. Recognise and apply stress patterns when performing a poem.

**How and when assessment will take place:**

T-S: During Stage 2, the teacher will spot and check individual pronunciation of the target phonemes.

S-S: learners will engage in peer correction while using the link maze during Stages 3 and 6.

S-T: learners will be encouraged to ask questions to gain formative feedback during Stages 4 and 7.

S-T: during Stage 9, learners will complete an exit ticket to self-assess their learning attitudes.





25/02/2025 Participants

| ID Letter | ID Number | Gender | Age | L1 | L2 | Proficiency |
|---|---|---|---|---|---|---|
| [redacted] | | F | 16 | Cantonese | Mandarin | Beginner |
| | | F | 16 | Cantonese | Mandarin | Intermediate |
| | | F | 16 | Cantonese | Mandarin | Proficient |
| | | F | 16 | Cantonese | Mandarin | Intermediate |
| | | M | 16 | Cantonese | Mandarin | Intermediate |
| | | M | 16 | Cantonese | Mandarin | Intermediate |
| | | F | 16 | Cantonese | Mandarin | Beginner |
| | | M | 16 | Cantonese | Mandarin | Beginner |
| | | M | 16 | Cantonese | Mandarin | Intermediate |
| | | F | 16 | Cantonese | Mandarin | Beginner |
| | | M | 16 | Cantonese | Mandarin | Intermediate |
| | | M | 18 | Cantonese | English | Beginner |

| 26/02/2025 Participants | | | | | | |
|---|---|---|---|---|---|---|
| ID Letter | ID Number | Gender | Age | L1 | L2 | Proficiency |
| [redacted] | | F | 16 | Cantonese | Mandarin | Intermediate |
| | | M | 17 | Cantonese | Mandarin | Intermediate |
| | | M | 16 | Cantonese | Mandarin | Beginner |
| | | M | 16 | Cantonese | Mandarin | Beginner |
| | | F | 16 | Cantonese | Mandarin | Beginner |
| | | F | 16 | Cantonese | Mandarin | Beginner |
| | | F | 16 | Cantonese | Mandarin | Beginner |
| | | M | 16 | Cantonese | Mandarin | Beginner |
| | | F | 17 | Cantonese | English | Intermediate |
| | | M | 16 | Cantonese | Mandarin | Intermediate |
| | | M | 16 | Cantonese | Mandarin | Beginner |





| Anticipated Learner Difficulties | Suggested Solutions |
|---|---|
| 1. **Pronunciation:** some learners are expected to have syllable-timed stress patterns transferred from their L1.<br>2. **Supra-segmental knowledge:** given the evidence of the pre-test, some learners may struggle with the concept of syllable division.<br>3. **Grouping:** Learners have been randomly allocated to this class, and do not have an established system for their pair work. | 1. One target of this lesson is to develop awareness of syllable reduction. The teacher will monitor instances of syllable-timing to encourage the lowering and shortening of pitch.<br>2. The teacher will scaffold learners with syllable division where necessary and give think-aloud guidance on the thought process behind diving the syllable.<br>3. Learners will be given clear seating instructions at the start of the lesson to arrange pairs as best as possible. |
| **Anticipated Teacher Difficulties:** | **Suggested Solutions:** |
| 1. **Time Management:** The lesson has 9 activities, and so mistiming them could upset the balance of the lesson.<br><br>2. **Awareness of reduced phonemes:** the lesson focuses on the reduction of /ə/, /ɪ/, /ʊ/, and /ɬ/; however, there may be instances where syllabic consonants and other vowel sounds, such as /e/, are audible for reduction. Including these phonemes is beyond the scope of the lesson, due to rational time constraints and concerns for cognitive overload. | 1. The teacher will favour time for the practice activities and activation stage, and will automatically enter these stages at the expense of others if necessary. These actions will be recorded in the field notes.<br><br>2. The teacher should be responsive to these sounds as necessary. Mini-plenaries have been built into the lesson plan as opportunities to elucidate these considerations if it is considered valid to adapt them into the lesson dialogue. |

| Lesson Stages | | |
|---|---|---|
| **Stages** | **Timing** | **Focus** |
| Stage 1: Engage | 5 minutes | Main Focus: To set the context of performing the poem "The Pig" by Roald Dahl (Dahl, 2012). |
| Stage 2: Study syllable reduction | 5 minutes | Main Focus: To raise awareness of syllable reduction for the formation of English stress patterns (Dalton & Seidlhofer, 1994). |
| Stage 3: Practice recognition of stress patterns | 10 minutes | Main Focus: To practice recognition of stress patterns with the fishing game (Hancock, 1995). |
| Stage 4: Mini-plenary | 5 minutes | Main Focus: To check answers and give feedback on stress pattern recognition (Black & Wiliam, 1998). |
| Stage 5: Present two-syllable stress rules | 5 minutes | Main Focus: To present rules for two-syllable stress patterns (Celce-Murcia et al., 2010). |
| Stage 6: Practice two-syllable stress patterns | 10 minutes | Main Focus: To practice recognition of two-syllable stress patterns with the stepping stones activity (Hancock, 1995). |
| Stage 7: Mini-plenary | 5 minutes | Main Focus: To check answers and give feedback on two-syllable stress pattern recognition (Black & Wiliam, 1998). |
| Stage 8: Activate | 2+8 minutes (2 minutes preparation; 8 minutes for pairs performance) | Main Focus: To perform the poem "The Pig" by Roald Dahl with attention given to stress production. |
| Stage 9: Evaluate | 5 minutes | Main Focus: To evaluate attitudes towards the lesson with exit tickets. |





| *Lesson Procedure* | | | | | |
|---|---|---|---|---|---|
| **Stage/Time/Aim** | **Learner Activity & Language** | **Teacher Activity** | **Materials** | **Interaction** | **Flexibilities** |
| **Stage 1**<br>*Engage*<br>5 minutes<br>**Main Aim:** To set the context of performing the poem "The Pig" by Roald Dahl (Dahl, 2012). | Learners will listen to the contextualising media: a performance of "The Pig" by Roald Dahl.<br>Learners will be prompted to discuss when they perform a text of this type, what may be difficult about performing it aloud, and what skills are useful to develop for a successful performance. | The teacher will elicit understanding through questioning.<br>The teacher will board relevant knowledge regarding performance of the text. | Whiteboard<br>Interactive blackboard (IBB)<br>Slideshow (with video/audio clip integrated)<br>Continuous assessment form | T-S<br>S-S | Learner knowledge and input will determine the feedback from the educator. The teacher should therefore be prepared to respond to comments on the students' experiences, when students perform poems of this type (e.g. speech festivals), and the purposes for performing (e.g. speech development, transmission of message, and development of oral artistry). |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 2**<br>*Study*<br>5 minutes<br>**Main Aim:** To raise awareness of syllable reduction for the formation of English stress patterns (Dalton & Seidlhofer, 1994). | Learners will echo the iambic stress patterns in response to the teacher's models and flashcard prompts.<br>The target stress pattern for this activity will be iambic (○●).<br>Target phonemes for this activity will be /ə/, /ɪ/, /ʊ/, and /ɬ/ (Underhill, 2005). | The teacher will introduce the concept of reduced sounds in English.<br>The teacher will demonstrate variations in stress with 'sSsSsS' and 'fFfFfF' models.<br>The teacher will introduce reduced phonemes using flashcards. | Slideshow (with integrated examples)<br>Flashcards<br>Whiteboard<br>IBB<br>Continuous assessment form | T-S<br>S-T | Learners may suggest examples of phrases to analyse for stress patterns.<br>The teacher may use the continuous assessment form to record errors or questions. |

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| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 3**<br>*Practice: recognition of stress patterns*<br>10 minutes<br>**Main Aim:** To practice recognition of stress patterns with the fishing game (Hancock, 1995). | Learners will participate in a demonstration of how to solve the fishing game.<br>Learners will work on the fishing game in pairs to match phrases with alike stress patterns. | The teacher will participate in a demonstration of how to solve the fishing game.<br>The teacher will monitor engagement with the activity and encourage interaction to solve problems.<br>The teacher may keep an answer key for reference to solutions. The key may be a basis for giving less able learners hints. | Slideshow<br>Fishing game worksheet<br>Whiteboard<br>IBB<br>Continuous assessment form | S-T<br>S-S | Depending on individual needs, the teacher should be prepared to respond to questions about stress patterns and the target language. |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 4**<br>*Mini-plenary*<br>5 minutes<br>**Main Aim:** To check answers and give feedback on stress pattern recognition (Black & Wiliam, 1998). | The learners should share their answers with peers.<br>Learners should ask the teacher questions if there are any unresolved problems. | The teacher should prompt learners to share their answers and draw attention to the matching stress patterns.<br>The teacher should respond to questions from learners. | Slideshow (with the fishing game integrated)<br>Whiteboard<br>Continuous assessment form | S-T<br>T-S<br>S-S | The teacher should be prepared to answer questions and concerns from students about the process for solving the fishing game. |

8

| (LP6) Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 5**<br>*Present: two-syllable stress rules*<br>5 minutes<br>**Main Aim:** To present rules for two-syllable stress patterns (Celce-Murcia et al., 2010). | Learners should listen and attempt to discriminate between the stress patterns. The teacher can say the word aloud and prompt learners to show the placement of the stress with one finger (for the first syllable) or two fingers (for the second syllable). | The teacher will present some guiding rules for differentiating stress in two-syllable words.<br>The rules will be as follows:<br>1. Stress often falls on the root element of a word, not the affix (e.g. unDO, outRUN, deCLARE, HARDly, TEACHer).<br>2. Two-syllable nouns often place stress on the first syllable (e.g. TABle, WINdow, DOCtor).<br>3. Two-syllable verbs often have stress on the second syllable (e.g. reLAX, deCIDE, proJECT). | Slideshow<br>Whiteboard<br>IBB<br>Continuous assessment form | T-S | The teacher may use concept checking questions to understand the level of comprehension among learners:<br>1. Is the stress on the first or second syllable?<br>2. Where is the stress?<br>3. What is the root of the word?<br>4. What is the affix/prefix/suffix? |





| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 6**<br>*Practice: two-syllable stress patterns*<br>10 minutes<br>**Main Aim:** To practice recognition of two-syllable stress patterns with the stepping stones activity (Hancock, 1995). | Learners will participate in a demonstration of how to solve the stepping stones game.<br>Learners will work on the stepping stones game in pairs to identify the idiosyncratic stress patterns. | The teacher will participate in a demonstration of how to solve the stepping stones game.<br>The teacher will monitor engagement with the activity and encourage interaction to solve problems.<br>The teacher may keep an answer key for reference to solutions. The key may be a basis for giving less able learners hints. | Stepping stones worksheet<br>Slideshow<br>Continuous assessment form<br>Whiteboard<br>IBB | S-S<br>S-T | Depending on individual needs, the teacher should be prepared to respond to questions about stress patterns and the target language. |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 7**<br>*Mini-plenary*<br>5 minutes<br>**Main Aim:** To check answers and give feedback on two-syllable stress pattern | The learners should share their answers with peers.<br>Learners should ask the teacher questions if there are any unresolved problems. | The teacher should prompt learners to share their answers and draw attention to the two-syllable stress patterns.<br>The teacher should respond to questions from learners. | Slideshow (with stepping stones game integrated)<br>Continuous assessment form | S-S<br>S-T | The teacher should be prepared to answer questions and concerns from students about the process for solving the stepping stones game. |

| | | | | | |
|---|---|---|---|---|---|
| recognition (Black & Wiliam, 1998). | | | | | |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 8**<br>*Activate*<br>10 minutes<br>**Main Aim:** To perform the poem "The Pig" by Roald Dahl with attention given to stress production. | Learners will prepare a duet performance of "The Pig" through rehearsal and attention to stress patterns. (2 minutes)<br>Learners will perform the poem for their classmates. | The teacher should monitor pairs and preparation approach to keep learners on task.<br>The teacher should encourage learners to attend to stress patterns at the rehearsal stage.<br>The teacher should select performers (preferably randomly).<br>The teacher should provide feedback to performances, especially for stress accuracy. | The Pig by Roald Dahl worksheet<br>Slideshow<br>Continuous assessment form | S-S<br>S-T | The timing for this stage could be extended to enable more performance and feedback time for learners. |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 9**<br>*Evaluate*<br>5 minutes<br>**Main Aim:** To evaluate attitudes | Learners will complete an exit ticket to evaluate their attitudes towards the lesson. | The teacher should manage the distribution and collection of resources. | Exit tickets<br>Slideshow<br>Continuous assessment form | S<br>S-T | The teacher should be responsive to questions from students. |





| | | | | | |
|---|---|---|---|---|---|
| towards the lesson with exit tickets. | | | | | |

## References

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, *5*(1), 7-74.

Celce-Murcia, M., Brinton, D. M., & Goodwin, J. M. (2010). *Teaching pronunciation hardback with audio CDs (2): A course book and reference guide*. Cambridge University Press.

Dahl, R. (2012). *Dirty beasts*. Random House.

Dalton, C., & Seidlhofer, B. (1994). *Pronunciation*. Oxford University Press.

Hancock, M. (1995). *Pronunciation games*. Cambridge University Press.

Underhill, A. (2005). *Sound foundations*. Macmillan Education.

## Appendix M

Oxford University Research Project | The Pronunciation Workshop | [redacted] Lesson Plan

| Lesson Designer: | [redacted] | Lesson Date: | 27/02/2025 |
|---|---|---|---|

**Control Group Lesson Plan**

**Context:**

This lesson is designed to train the speech delivery of participants when performing a poem for a speech festival.
As part of randomised controlled trial, the participants have completed a pre-test that assessed their receptive and productive skills in relation to word stress. This group is participating in the placebo class that will train alternative speaking skills.

**Overall Aim:**

By the end of this lesson, students will be better able to:

1. Identify the similar sounds and rhyming pattern of the poem The Pig by Roald Dahl.
2. Recognise and discriminate between minimal pairs when performing the poem.

**How and when assessment will take place:**

T-S: During Stage 2, the teacher will spot and check individual pronunciation of the difficult lexis.

S-S: learners will engage in peer correction while using the pronunciation journey during Stage 4.

S-T: learners will be encouraged to ask questions to gain formative feedback during Stages 2, 5, and 7.

S-T: during Stage 9, learners will complete an exit ticket to self-assess their learning progress.

1

Oxford University Research Project | The Pronunciation Workshop | [redacted] Lesson Plan

Participants

| ID Letter | ID Number | Gender | Age | L1 | L2 | Proficiency | Attendance |
|---|---|---|---|---|---|---|---|
| [redacted] | | F | 16 | Cantonese | Mandarin | Intermediate | |
| | | M | 16 | Cantonese | Mandarin | Intermediate | |
| | | M | 17 | Cantonese | Mandarin | Beginner | |
| | | F | 16 | Cantonese | Mandarin | Beginner | |
| | | M | 17 | Cantonese | Mandarin | Intermediate | |
| | | M | 16 | Cantonese | Mandarin | Beginner | |
| | | M | 17 | Cantonese | Mandarin | Beginner | |
| | | F | 16 | Cantonese | Mandarin | Intermediate | |
| | | F | 16 | Cantonese | Mandarin | Intermediate | |
| | | F | 16 | Cantonese | Mandarin | Intermediate | |
| | | F | 16 | Cantonese | Mandarin | Beginner | |
| | | M | 16 | Cantonese | Mandarin | Beginner | |

2

| Anticipated Learner Difficulties | Suggested Solutions |
|---|---|
| 1. **Pronunciation:** based on observations from the experimental lessons, some learners are expected to struggle with the pronunciation of the lexis /bɪg/, /pɪg/, /ˈklɛvə/, /pleɪn/, /rɛd/, /ˈʤaɪᵊnt/, /sʌm/, and /ˈwʌndrəs/.<br>2. **Minimal pair knowledge:** learners may be unfamiliar with the international phonetic alphabet referred to in the lesson to illustrate minimal pairs.<br>3. **Grouping:** Learners have been randomly allocated to this class, and do not have an established system for their pair work. | 1. These terms have been incorporated into the minimal pairs practice and as examples of difficult elements of the poem at the mini-plenary stage.<br>2. References to IPA symbols should be tethered with clear examples of the phoneme. As such, the teacher will model sounds to scaffold learner understanding.<br>3. Learners will be given clear seating instructions at the start of the lesson to arrange pairs as best as possible. |
| **Anticipated Teacher Difficulties:** | **Suggested Solutions:** |
| 1. **Time Management:** The lesson has 9 activities, and so mistiming them could upset the balance of the lesson.<br>2. **Eliciting Discussion:** participants may be reluctant to respond to questioning from the teacher. | 1. The teacher will favour time for the practice activities and activation stage and will automatically enter these stages at the expense of others if necessary. These actions will be recorded in the field notes.<br>2. The teacher should be familiar with the students on a name basis to encourage interaction. Building a rapport with the students early on, with acknowledgement of their emotions and support for their other school activities, may reduce foreign language anxiety. |





| Lesson Stages | | |
|---|---|---|
| **Stages** | **Timing** | **Focus** |
| Stage 1: Engage | 5 minutes | Main Focus: To set the context of performing the poem "The Pig" by Roald Dahl (Dahl, 2012). |
| Stage 2: Mini-plenary | 5 minutes | Main Focus: To discuss what parts of the poem are difficult to pronounce (Black & Wiliam, 1998). |
| Stage 3: Study minimal pairs | 5 minutes | Main Focus: To identify and drill minimal pairs from the poem (Celce-Murcia et al., 2010). |
| Study 4: Practice minimal pairs | 10 minutes | Main Focus: To practice the minimal pairs using the pronunciation journey activity (Hancock, 1995). |
| Stage 5: Mini-plenary | 5 minutes | Main Focus: To give feedback on pronunciation of the minimal pairs (Black & Wiliam, 1998). |
| Stage 6: Study phonology | 5 minutes | Main Focus: To analyse the rhyming pattern of the poem (Fleming & Stevens, 2014). |
| Study 7: Mini-plenary | 5 minutes | Main Focus: To give feedback on pronunciation of the rhyming words (Black & Wiliam, 1998). |
| Stage 8: Activate | 2+13 minutes (2 minutes preparation; 8 minutes for pairs performance) | Main Focus: To perform the poem "The Pig" by Roald Dahl with attention given to the enunciation of minimal pairs. |
| Stage 9: Evaluate | 5 minutes | Main Focus: To review what has been learned in the lesson. |

| Lesson Procedure | | | | | |
|---|---|---|---|---|---|
| **Stage/Time/Aim** | **Learner Activity & Language** | **Teacher Activity** | **Materials** | **Interaction** | **Flexibilities** |
| **Stage 1**<br>*Engage*<br>5 minutes<br>**Main Aim:** To set the context of performing the poem "The Pig" by Roald Dahl (Dahl, 2012). | Learners will listen to the contextualising media: a performance of "The Pig" by Roald Dahl.<br>Learners will be prompted to discuss when they perform a text of this type, what may be difficult about performing it aloud, and what skills are useful to develop for a successful performance. | The teacher will elicit understanding through questioning.<br>The teacher will board relevant knowledge regarding performance of the text. | Whiteboard<br>Interactive blackboard (IBB)<br>Slideshow (with video/audio clip integrated)<br>Continuous assessment form | T-S<br>S-S | Learner knowledge and input will determine the feedback from the educator. The teacher should therefore be prepared to respond to comments on the students' experiences, when students perform poems of this type (e.g. speech festivals), and the purposes for performing (e.g. speech development, transmission of message, and development of oral artistry). |





| **Stage/Time/Aim** | **Learner Activity & Language** | **Teacher Activity** | **Materials** | **Interaction** | **Flexibilities** |
|---|---|---|---|---|---|
| **Stage 2**<br>*Mini-plenary*<br>5 minutes<br>**Main Aim:** To discuss what parts of the poem are difficult to pronounce (Black & Wiliam, 1998) | The learners will discuss in pairs what is difficult to pronounce in the poem.<br>The learners will share their thoughts with the teacher on the difficult lexis. | The teacher will elicit discussion of the difficult vocabulary items.<br>The teacher will model correct pronunciation and draw attention to the contentious phonemes. | Text of The Pig by Roald Dahl<br>Slideshow (with integrated examples)<br>Whiteboard<br>IBB<br>Continuous assessment form | S-S<br>S-T | The teacher may offer some examples of anticipated pronunciation errors that may have been heard in other classes or readings. |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 3**<br>*Study: minimal pairs*<br>5 minutes<br>**Main Aim:** To practice minimal pairs from the poem (Celce-Murcia et al., 2010). | Learners should echo the minimal pairs from the teacher.<br>Learners should give listen and give feedback on the teacher's minimal pairs model, e.g. one finger for [b], two fingers for [p]. | The teacher will share example minimal pairs from the poem.<br>The teacher will model minimal pairs to elicit comprehension of the differences. | Slideshow (with integrated examples)<br>Whiteboard<br>IBB<br>Continuous assessment form | T-S<br>S-T<br>S-S | Depending on individual needs, the teacher should be prepared to respond to questions about minimal pairs and the language of the poem. |





| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 4**<br>*Practice: minimal pairs*<br>10 minutes<br>**Main Aim:** To practice the minimal pairs using the pronunciation journey activity (Hancock, 1995). | Learners will participate in a demonstration of how to solve the pronunciation journey game.<br>Learners will work on the pronunciation journey game in pairs to discriminate minimal pairs. | The teacher will participate in a demonstration of how to solve the stepping stones game.<br>The teacher will monitor engagement with the activity and encourage interaction to solve problems. | Pronunciation journey worksheet<br>Slideshow (with the pronunciation journey integrated)<br>Whiteboard<br>Continuous assessment form | S-T<br>T-S<br>S-S | The teacher should be prepared to answer questions and concerns from students about the process for solving the fishing game. |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 5**<br>*Mini-plenary*<br>5 minutes<br>**Main Aim:** To give feedback on pronunciation of the minimal pairs (Black & Wiliam, 1998). | One learner should guide the class through the pronunciation journey.<br>All other learners should attempt to follow the pathway to get to the speaker's intended destination. | The teacher can invite a student to play the activity with the class.<br>The teacher should offer corrections where necessary. | Slideshow<br>Whiteboard<br>IBB<br>Continuous assessment form | T-S | |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 6**<br>*Study phonology*<br>10 minutes<br>**Main Aim:** To analyse the rhyming pattern of the poem (Fleming & Stevens, 2014). | Learners will read The Pig to identify the rhyming pattern. Learners should recognise the AA-BB-CC-DD…NN pattern of the rhyme scheme. | The teacher will model an example of a rhyme.<br>The teacher will monitor learners as they identify the rhyme pattern. | Stepping stones worksheet<br>Slideshow<br>Continuous assessment form<br>Whiteboard<br>IBB | S-S<br>S-T | Depending on individual needs, the teacher should be prepared to respond to questions about minimal pairs and the target language. |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 7**<br>*Mini-plenary*<br>5 minutes<br>**Main Aim:** To give feedback on pronunciation of the rhyming words (Black & Wiliam, 1998). | The learners should share their answers with peers.<br>Learners should ask the teacher questions if there are any unresolved problems. | The teacher should prompt learners to share their answers and draw attention to the rhyme scheme.<br>The teacher should draw attention to the similar sounds and utility of rhyme for working out pronunciation. | Slideshow (with stepping stones game integrated)<br>Continuous assessment form | S-S<br>S-T | The teacher should be prepared to answer questions and concerns from students about the rhyme scheme. |





| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 8**<br>*Activate*<br>15 minutes<br>**Main Aim:** To perform the poem "The Pig" by Roald Dahl with attention given to the enunciation of minimal pairs. | Learners will prepare a duet performance of "The Pig" through rehearsal and attention to minimal pairs. (2 minutes)<br>Learners will perform the poem for their classmates. | The teacher should monitor pairs and their preparation approach to keep learners on task.<br>The teacher should encourage learners to attend to minimal pairs at the rehearsal stage.<br>The teacher should select performers (preferably randomly).<br>The teacher should provide feedback to performances, especially for minimal pair accuracy. | The Pig by Roald Dahl worksheet<br>Slideshow<br>Continuous assessment form | S-S<br>S-T | The timing for this stage could be extended to enable more performance and feedback time for learners. |

| Stage/Time/Aim | Learner Activity & Language | Teacher Activity | Materials | Interaction | Flexibilities |
|---|---|---|---|---|---|
| **Stage 9**<br>*Evaluate*<br>5 minutes<br>**Main Aim:** To review what has been learned in the lesson. | Learners will complete an exit ticket to evaluate their attitudes towards their learning progress. | The teacher should manage the distribution and collection of resources. | Exit tickets<br>Slideshow<br>Continuous assessment form | S<br>S-T | The teacher should be responsive to questions from students. |

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