

Schwa in the Sound Production of EFL Freshmen: Heavily Accented English

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Abstract:

Pronunciation of words with schwa sound is a challenging task for many EFL learners, as it constitutes a major source of mispronunciation and foreign sounding. EFL students, mainly with limited exposure to native-speakers speech, fail to notice the behavior of this sound in many orthographic aspects of words. Consequently, their spoken output becomes replete with deviant forms. This paper, hence, aims to explore how EFL freshmen perceive the different orthographic representations of schwa in words. It also attempts to assess the extent to which these students are able to pronounce words with schwa occurring in different positions. To collect data, a pronunciation test was administered to 53 freshmen. Findings confirm that EFL freshmen confuse vowel letters with reduced vowel sounds. Additionally, the transcription inaccuracies made reflect the participants' habit of pronouncing English words with an accent most typical of French language. Correspondingly, this paper concludes with some pedagogical implications.

Keywords: Accuracy, EFL students, foreign accents, schwa, transcription

1. Introduction

The ability to pronounce L2 words accurately is perceived as an index of oral proficiency. English linguistic system is characterized by its own sub-systems of sounds where certain phonotactic constraints govern the combination of short and long vowel sounds in certain

expected meaningful forms. Schwa is the most commonly occurring sound in a phonemic pattern in English. Its underuse, overuse or misuse has an immediate effect on stress placement in words and, in turn, this can lead to the distortion of accent and meaning.

The investigation of the production of schwa by EFL students abounds in recent literature. Different aspects of schwa sound were examined from different dimensions. For example, Indrayani and Nugraha (2020) concluded that since schwa has almost a similar neutral vowel (Muna Language in this case), EFL students acquired a habit of pronouncing a schwa in a way that is different from its close counterpart in their L1 to eliminate foreign accent in their oral performance. Along the same lines Shahid , Shabbir and Aslam (2023) examined the production of schwa by Pakistani speakers of English and arrived at the conclusion that schwa poses a real challenge in pronunciation. Ariyani (2019) on the other hand, analyzed the pronunciation errors in schwa-containing words and found that the colloquial forms of the variety of L1 of the UNSIQ students has an impact on the production of schwa in English.

It is wise to acknowledge that, up to the time of writing, existing literature has inadequately covered EFL students' production of schwa sound in relation to other reduced vowel sounds. Furthermore, the variety of graphemes that represent schwa sound in the sound system of English are also little researched especially that EFL students unawareness of this aspect is very likely to affect their pronunciation competence. To this end, the current study is set to seek answers to the following questions:

1. How accurately can EFL freshmen transcribe schwa-containing words?
2. Do they confuse a vowel sound with a vowel letter? In other words, do the participants mistake the schwa vowel sound with the actual pronunciation of the spelled individual vowel letter(s)

In the light of the above query, we assume that:

1. The non-correspondence between the schwa vowel sound and its representative spelling is very likely to mislead EFL freshmen about the accurate transcription of words. In crude terms, such students are unaware of the fact that schwa sound has varying orthographic representations in English.

2. The varying positions of schwa in English words may, to some extent, affect EFL students' transcription accuracy, i.e. these students can accurately transcribe a schwa-containing word depending on whether schwa is in initial, middle or final position.

2. Literature review

2.1 Schwa sound in English

Etymologically, the word schwa comes from the Hebrew word *shewa* which usually denotes the concept of “emptiness”. Phonetically, schwa is a mid-central vowel sound that occurs in an unstressed syllable where there is no movement in the vocal tract as a result of articulation. Schwa is technically defined by different labels such as “unstressed sound”, “neutral sound”, “reduced sound” and “centralized sound”. It is the most prevalent vowel sound in English. Native speakers produce schwa nearly in every three vowels (Flemming & Johnson, 2007). In the International Phonetic Alphabet (IPA), schwa is phonemically represented in transcription by the symbol /ə/ (upside down “e”). Schwa is commonly perceived as a default phoneme owing to its pervasiveness in the sound system of English (Boswell, 2020). The occurrence of schwa in a word can be in the initial, middle or final position. Schwa can be a typical defining feature of the weak forms of modals and auxiliary verbs (Carley & Mees, 2021).

The production of the schwa sound in certain languages, the likes of English, Indonesian and Dutch is a result of a phonological process where contrasts in vowel quality are neutralized. This, in turn, renders any vowel reduced and therefore a schwa-containing syllable unstressed (Booij, 1995).

A historical analysis of this sound shows that it had undergone certain phonetic change. Therefore it can be argued that the different occurrences of schwa in the English sound system is related to the emergence of the varieties of English spoken nowadays (Minkova & Lefkowitz, 2021). The frequent omission of schwa in Southern British standard variety does not affect the meaning of a given word. However, in General American English the omission of vowel results in total mispronunciation, i.e. distorted meaning thus Kapranov (2021) illustrates such difference in the two different but possible transcriptions of the word *military* : /'militri/ and /'mɪləteri/. While the former includes the sound /i/ in the second syllable (a variant of

British English), the latter features schwa in the second syllable as a substitute for the sound /i/ (the case of General American English).

2.2 The variation of schwa position

As explained by Flemming and Johnson (2007), the realization of schwa sound features two phonetic differences. Depending on the position of schwa in words, the occurrence of schwa in final position, in words such as camera and sofa, qualifies this sound as consistent mid-central closer to the phoneme /æ/ as opposed to relative high, where schwa occurs in mind-position. For example in the words correct and probable, the articulatory properties of schwa vary at the level of the tongue and lips position due to the phonological process of assimilation with the surrounding phonemes, i.e. the context. In this case schwa becomes closer in properties to the short /i/ sound.

Piva and Strand (2023) investigated the degree to which schwa is sensitive to the context and duration. Since schwa, compared to other vowels, is shorter thus it is sensitive to the influence of the context. However, it is proved to be more influenced by the correlation between duration and the F1 values. Correspondingly, Priva and Strand assert that schwa has no target since the acoustic position of vowels is seemingly determined by three factors: the vowel property, the target and the context.

The phonetician debate of whether or not schwa is qualified as a phoneme is based upon certain reasons. Giegerich (1992), for instance, argues that there are only two cases where schwa can be found in a stressed syllable or monosyllabic words. It is in the articles the and a. Another reason that lends support to the view that schwa does not qualify as a phoneme is the fact that in an unstressed syllable a given vowel loses its contrastive properties in which it becomes schwa and thus it is labeled as a default vowel rather than a phoneme. Besides, Giegerich also explains that in English it is never possible for a minimal pair to be based on schwa since the latter is neutral in which it does not make any contrast with any full vowel sound. Along the same lines, Flemming and Johnson (2007), Kreidler (1989) and Wallance (1994) conclude that schwa is considered as a default vowel sound whose spontaneous occurrence correlates with a vowel loss of its contrastive properties. Therefore, schwa takes over the position and the orthographic representations of most vowel sounds in English.

We should not lose sight of the fact that such grapheme, phoneme, and schwa complexities are very likely to be a prominent

source of mispronunciation among EFL students. This what the present study is going to investigate.

2.3 The orthographic representations of schwa and a similar unstressed vowel

Before starting our discussion of the relationship between spelling the transcription/pronunciation of many vowel letters as schwa, it is wise to first consider the closely related behavior of each of the sounds /ə/ and /ɪ/ in English language.

The reduction of full vowels to unstressed vowels is historically related to these seemingly two similar vowel sounds. They are known to present certain variation in unstressed syllables, though certain pronunciations with either vowel sound are considered proper in a wide range of words in English (Wells, 1990). This view is supported by what Fabricuis (2002) considers as an ongoing substitution of /ɪ/ with /ə/. Such vowel change is confirmed by Fabricuis investigation of certain transcriptions in a wide range of dictionaries over a number of decades. Accordingly, he found that there is a constant shift towards schwa instead. Likewise, the findings of Gimson (1984) study reveal that, after the examination of RP speech by 20 native speakers, /ə/ is widely being replaced by /ɪ/.

It can be argued now that being /ə/ or /ɪ/ suggests that there could be some degree of prediction with regard to spelling that represents each of these vowel sounds. Very often, the vowel sound /ɪ/ is either spelt as a letter “e” or “I” in unstressed syllable (Roach,1983). On the other hand, /ə/ can be represented by each of the letters “a”, “o” and “u”, while the letter “e” is reported to represent both of /ə/ or /ɪ/ (Wells, 1990). Similarly, Beol’s (1999) contends that as opposed to the pronunciation of the letter “e” and “I” in a word, the letters “a”, “o” and “u” are historically known to be pronounced as schwa sound. One explanation of this seems to lie in the fact that the nature of a reduced vowel is originally a full vowel. Ladefoged and Johnson (2014) illustrate this premise with the words that have the same stem, e.g. political and politics. They indicate that the letter “o” as representative of schwa is derived from the vowel /ɔ/. The same thing goes for the case of certain words where it is acceptable to have schwa used interchangeable with a full vowel,e.g. the two possible pronunciations of the word direction /də'rekʃən/ and /dai'rekʃən/ where the full vowel (the diphthong) /ai/ is used interchangeably with schwa.

To conclude this discussion, Tasker (2020) in her PhD thesis arrived at the conclusion that the vowel sound /ɪ/ can be used interchangeably with /ə/ but the opposite is not possible. Thus, since each of the letters “i” and “a” are commonly the most frequent representatives of the vowel sounds /i/ and /ə/, a caveat should be made concerning the degree to which the production of unstressed vowels, particularly /ə/, is influenced by orthography. Along the same lines in a study conducted by Lilley in 2012, front full vowels are generally found to be proxies for spellings that deemed frontier. It is safe to assume at this point that the sound variations represented by spelling should be considered as a good tool to analyze the patterns that schwa defines as unstressed.

3. Methodology

3.1 Participants

A total of 53 EFL students comprise the subjects of this study. With the vast majority of female participants (46), males are only eight. The subjects’ ages range from 18 to 45 years old with the average age of 18. These participants are first year EFL students at the Department of English at Si El Haoues University Center of Barika south-east Algeria. Arabic is spoken as the mother tongue and French is spoken as a second language in Algeria. English is a foreign language that is taught as an obligatory school subject for four years at Middle School and three years at High School. Thus, the participants of this study are homogenous in terms of age and the formal exposure to English, i.e. adult intermediate EFL students.

Before the examination of these students pronunciation via a test ,an informed consent was verbally obtained from them to assure these participants that the results of test they take is just meant for research purposes only and not related to any official summative or formative evaluation.

3.2 Data collection

To find answers to the main research questions in the present study, quantitative data was obtained using a pronunciation test. The latter generally aims to examine the participants’ ability to recognize the different orthographic representations of schwa in words and, correspondingly, the extent to which these participants are able to transcribe such schwa-containing words accurately. The test was painstakingly devised by the author himself. Using Oxford Advanced Learners’ dictionary (8th edition), the transcriptions adopted in this test is based on the Received Pronunciation (RP).

Two activities comprise the test and each one serves a particular purpose (see appendix). The first activity is focused on accurate transcribing of schwa-containing words where schwa can be orthographically represented in different ways (by the different vowel letters a,e,i,o and u) and , at the same time , such representations can occur in several positions (initial , middle and final) in words.

The aim of this activity is to measure the participants' level of awareness of the different vowel letters that represent schwa sound which can occur in the different aforementioned positions. The second activity is meant to test the participants' ability to distinguish schwa sound from the rest of the short vowel sounds where the schwa sound is orthographically represented by different graphemes.

The pronunciation test was administered at the beginning of December 2024. The participants had to do the test within a span of 50 minutes. Under some instructions given to the participants, the test was invigilated and overseen by the researcher himself. The presence of the researcher giving the instructions did not yield any visual or verbal clues that would affect the participants own answers.

3.3 Procedure

To assess the participants' performance in the transcription test, the authors self-designed a scoring system to process and judge the transcription of the participants. Each word transcribed by the students was juxtaposed with its corresponding transcription found in the aforementioned Oxford Dictionary. Each correct transcription in both activities was sored one point.

Since the test includes two activities that are meant for different purposes, the results were processed as follows. To start with, the items in the first activity were grouped into three categories that each specifies one of the initial, middle and final position in which schwa occurs in the words respectively. Furthermore, each group also defines the vowel letters that represent schwa in the aforementioned positions. For example, the first group represents the occurrence of schwa in the initial position where schwa sound is orthographically represented by one of the letters *a, e,i,o* and *u* .The same process was applied to the rest of the groups that indicate the remaining positions with the aforementioned orthographic representations.

The second activity, on the other hand, has its items grouped according to the short vowel sounds that the learners confuse with the schwa sound .For example, the possible orthographic representations of the schwa sound are contrasted with the possible orthographic

representations of the following short vowel sounds /æ/, / ʊ/, / ə/, / ɪ/, / ɔ/, / e/, / ʌ/ that EFL learners are very likely to mistake the schwa sound with.

4. Results

The findings obtained reveal a lot about the performance of the students in the different activities of the pronunciation test. In the first activity, where the aim is to assess the participants awareness of the different orthographic letters that represent schwa occurring in different positions in words, each of the vowel letters *a*, *o*, *u* and *e* represents schwa sound in the initial position of words.

Table 1. Students transcription of words with initial-position schwa

Vowel letter representing /ə/	Frequency	Percentage
a	63	59.43 %
o	10	09.43 %
u	08	07.54 %
e	07	06.60 %

As table (1) shows, the vowel letter “a” for instance is transcribed as schwa in the majority (59.43 %) of the students responses. The transcription accuracy in this case denotes the participants’ awareness of the possible occurrence of schwa sound in initial position where it is orthographically represented by the letter “a”. However, if we compare this with the rest of the possible orthographic representations of schwa in initial position we can notice that only few students could accurately transcribe the words given in the test. Thus, as low as 09.43 % represents the students’ accurate transcription of words with initial-position schwa that is spelt with the letter “o”. Similarly and in percentage terms, 07.54 % and 06.60 % represent the accurate transcription of words with initial-position schwa that is spelt with either of the vowel letters “u” or “e” respectively. On the whole, the inaccurate transcriptions revealed in the findings of the transcription test of words with initial-position schwa clearly show that the participants can only transcribe words whose initial -position schwa is orthographically represented by the vowel letter “a”.

Table 2. Students transcription of words with mid-position schwa

Vowel letter representing /ə/	Frequency	Percentage
e	06	05.66 %
a	13	12.26 %

Considering the results in table (2), the transcription of mid position schwa- containing words reveals different facts about the participants’ ability to recognize schwa sound that is represented by different vowel letters. For instance where schwa sound could be spelt with the vowel letter “e” in the middle of a word, only 06 words were accurately transcribed by the participants in the test. This can indicate the students’ lack of awareness of the possible phonotactic considerations that an unstressed syllable could occur in the middle of a given word. Equally important, such unstressed syllable can be defined by the vowel letter “e” that represents the schwa sound. Evidently, the participants were able to accurately transcribe only 13 words whose mid-syllable includes schwa sound that is represented by the vowel letter “a”. Once again this means that the participants are unaware of the fact that, likewise, the vowel letter “a” can represent

the schwa sound that defines an unstressed syllable occurring in mid-position.

Table 3. Students transcription of words with final-position schwa

Vowel letter representing /ə/	Frequency	Percentage
a	43	40.56 %
e	08	07.54 %
o	06	05.66 %
u	10	09.43 %

What can be noticed in table (3) is the varying levels of performance by the participants in the transcription of words with schwa occurring at the final position. Schwa in this case is defined by various vowel letters. Thus, a significant percentage (40.56 %) of such words, where the schwa sound is orthographically represented by the letter “a”, is accurately transcribed. What can be inferred from this is the participants’ awareness that the vowel letter “a” can represent the schwa sound when it occurs at the end of a word as such syllables are usually unstressed in English. By contrast, if we consider the rest of the orthographic representations of the schwa sound occurring in final position (final syllable) we can notice a declining performance in the students accurate transcription. For example, a low percentage (07.54 %) represents the students’ accurate transcription of words with final position schwa that is spelt with the vowel letter “e”. Surprisingly, the lowest percentage (05.66 %) refers to the small number of the accurately transcribed words with final position schwa that is spelt with the vowel letter “o”. Only 09.43 % represents the accurately transcribed words with schwa sound that is represented by the vowel letter “u”. Taken together, these results indicate that the low ability of the participants to transcribe schwa-containing words accurately is related to the kind and position of vowel letters representing the schwa sound.

Table 04. Students confusing vowel sounds with vowel letters representing schwa

Vowel letter(s)	Transcribed as /ə/ (frequency)	Percentage	Transcribed as other vowel sounds	Frequency	Percentage
a	16	30.18 %	/ e/	13	24.52 %
e	18	33.96 %	/ e/	19	35.84 %
o	11	20.75 %	/ ɔ/	31	58.49 %
i	05	09.43 %	/ ɪ/	42	79.24 %
iou	10	18.86 %	/ ʊ/	16	30.18 %
io	08	15.09 %	/ ɔ/	27	50.94 %
u	09	16.98 %	/ Λ/	18	33.96 %

The analysis of the results of the second activity in the transcription test shows that the participants' production of the schwa sound is, to a great extent, affected by their perception of the nature of the various graphemes that represent certain short vowel sounds. Thus, the statistics in the table above demonstrate that, in the transcriptions of the participants, the schwa sound is confused with short vowel sounds that have similar orthographic representations.

If we consider the vowel letters that are correctly transcribed as schwa we can find that the highest available percentage (33.96 %), among the rest of transcriptions, refers to the words where the vowel letter "e" is pronounced schwa. The latter, at the same time, was wrongly perceived as / e/ for 35.84 % of the cases. Similarly, in one of the cases (30.18 % of the words) the vowel letter "a" was correctly transcribed as schwa but mistaken for the sound / e/ in 24.52 % of answers. Each of the low percentage of 16.98 % and 20.75 % respectively represent the instances where each of the vowel letters "u" and "o" were correctly transcribed as schwa sound. However if we consider the erroneous forms of transcription we can clearly notice that the aforementioned vowel letters respectively were wrongly transcribed as / Λ/ for 33.96 % of the cases and as /ɔ/ for more than half of the rest of the instances (58.49 %). On the other hand, the digraphs "iou" and "io" were correctly transcribed as schwa in only few cases (18.86 % and 15.09 % respectively) and wrongly transcribed as /ʊ/ (in 30.18 %) and as /ɔ/ in half of the instances (50.94 %). Lastly, the lowest percentage (09.43 %) refers to the only few words where the vowel letter "i" was correctly transcribed as

schwa. Strikingly, the latter was, to a great extent, wrongly perceived as / ɪ / in the majority of the words (79.24 %).

5. Discussion

The results of assessing the participants' performance at the different stages of the transcription test can be taken to inform us a lot about many issues. How EFL students produce schwa and how much they are aware of the phonotactic behavior of this sound can all be discussed from different dimensions.

As far as the students' transcription of the words with initial position schwa is concerned, it is evident that their ability to accurately transcribe such words is only limited to words that start (or has its initial syllable starts) with the vowel letter "a", e.g. amazing, balloon ...etc. This could be attributed to the fact that such EFL students, since they are intermediate, are exposed more to words of such nature. Their unawareness of the rest of the orthographic representations of schwa results in inaccurate transcription of words with initial vowel letters (e.g. oblige, upon ...etc.), which reflects mispronunciation at different levels. This suggests that the pronunciation competence of intermediate EFL students is to a large extent affected by their increased exposure to French (as a second official language in Algeria) where students base their pronunciation of English words on phonological features related to French. Along the same lines, in a study conducted by Yin (2009), it was concluded that EFL students problems in schwa production is related to the way the place and manner of articulation differ in the target and source language. Similarly, Rahal (2014) attributed the same pronunciation problem to the impact of the phonological specificities in French language.

A clear picture emerges if we consider the poor performance of the students in the transcription of words with mid-position schwa. Though students could correctly transcribe only few words, the accuracy here features the vowel letter "a" as the most frequent proper grapheme representing the schwa sound in words such vitamin, keratin...etc. This, to some extent, might be due to the students' knowledge of certain phonological constraints where certain vowels (in this case represented by the letter "a") are reduced to schwa to mark unstressed syllable.

Another area that deserves our closer attention is the poor performance of the students in the transcription of words ending in schwa or having schwa in their final syllable. Surprisingly, most of the

successfully transcribed words reported earlier feature the letter “a” (representing schwa) in those word endings. Again, this can be interpreted as learners’ tendency to perceive the final letter “a” as schwa (e.g. cinema, panda...etc.), since it is a common feature that most words in English end in an unstressed.

It is wise to acknowledge that since the vowel letter “a” proved to be perceived, by EFL intermediate students, as a frequent representative of schwa sound in unstressed syllable, this sends us back to confirm what we hypothesized earlier. In other words, EFL transcription accuracy depends, to a great extent, on the position of schwa in a given word. Equally important, this is easy to notice by EFL students when such position is labeled as initial unstressed syllable. These findings are echoed in what Volín, Weingartová and Skarnitzl (2013) claim as the pattern of stress that suggests to the speakers the position which include either a full vowel or schwa.

At this point it is safe to acknowledge that students’ perception of the nature of the different vowel graphemes in English affects their ability to recognize the various occurrences of schwa in English words. Strikingly, in most of the test results demonstrated earlier, the schwa sound is wrongly replaced by a number of short vowel sounds whose representative symbols seem to correspond to the same form (grapheme) of certain vowel letters. This evidence confirms our hypothesis that EFL intermediate students assume that spelling corresponds to sounds. As a result, they confuse vowel letters with vowel sounds in particular schwa. This premise lends support to what Rahal (2014), Ocal and Ehri (2017) and, more recently, Kapranov (2021) point out concerning the fact that the non-correspondence between grapheme and phoneme misleads EFL students about correct pronunciation.

6. Conclusion

Being the most prevalent vowel sound in English, the ability to recognize and produce schwa in proper place reflects a native-like English accent. The main objective of this paper is to examine the ability of EFL freshmen to recognize the different orthographic representations of schwa in words. Correspondingly, we tested the extent to which these students are able to transcribe, matching the RP accuracy, schwa sound that is identified in different positions in words. In the light of these study findings, it can be concluded that EFL freshmen confuse vowel letters with reduced vowel sounds in particular the schwa sound. The latter has proved to be a missing

sound in the students' transcriptions, and if any, it is mistakenly substituted for another reduced short vowel mainly / ɪ/. It is also confirmed through the results of this study that the transcription accuracy reported is limited to the occurrence of schwa in initial position. The deviant forms of pronunciation, reflected in the transcription of words, carry the connotation of sounding foreign. Since any schwa-containing syllable is technically unstressed, then altering schwa with other vowel sound results in misplaced primary stress and, thus, it deforms the expected original accent.

The reported performance of EFL freshmen highlights some pedagogical implications for the different parts in the teaching process. First, the teaching of the sound system of English should be focused on raising EFL learners' awareness of the difference between L1 and L2 stressed and unstressed syllables. Classroom activities based on contrastive analysis would increase EFL ability to notice how schwa can be orthographically represented in a way that is different from the behavior of its counterpart sound in the L1 of learners.

Pronunciation competence in a foreign language learning setting reflects a native-like accent where every pronounced word is expected to be demonstrated through accurate transcription. However, basing the assessment of schwa production solely on accurate transcription may not give a definitive answer. Students may exhibit different performance when they actually articulate words in the target language. Hence, judging the actual sound production of EFL students in general would yield more informative results.

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Appendix

Activity 01: Transcribe these words accurately

- Amazing
- Balloon
- Oblige
- Potato
- Upon
- Suppose
- Perception
- Heroic
- Cinema
- Panda
- Carrot
- Translator
- Virus
- Circus
- Sensible
- Tangible
- Tablet
- System
- Keratin

- Vitamin
- Biology
- Psychology
- Secular
- Cellular
- Obesity
- Policy
- Cinematic
- Systematic

Activity 02: Use the following list to provide the missing sound in order to complete the transcription of every word (add only one sound to each word):

æ, ʊ, ə, ɪ, ɔ, e, ʌ

1. Chocolate /tʃɔkl.....t/
2. Interesting /ɪntr.....stɪŋ /
3. Information /ɪnf.....meɪʃn /
4. Suspect /s.....spekt /
5. Impossible /ɪmpɒs.....bl /
6. Anxious /æŋkʃ.....s /
7. Idiot /ɪdi.....t /
8. Suspected /s.....spektɪd/