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AN ANALYSIS OF PRONUNCIATION ERRORS PRODUCED BY INDONESIAN LEARNERS OF ENGLISH: A CASE STUDY OF ENGLISH DEPARTMENT STUDENTS OF TRUNOJOYO UNIVERSITY

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Abstract: The present study investigated pronunciation errors made by English learners as a foreign language (EFL). We attempted to find the types of pronunciation errors in the consonants and vowels in English. To achieve this, twenty students of the English Department at Universitas Trunojoyo Madura were recruited as participants. They were asked to pronounce seventy-five English words that contain the consonants [v], [θ], [ð], and [ʒ] and the vowels [ʌ], [æ], [ɑ], [ɜ], [ɒ], [eɪ], [əʊ], and [ɪə]. The consonants and vowels were chosen based on the differences between English and Indonesian since the participants' first language is Indonesian. The study used a descriptive qualitative method employing the convenience sampling technique for its data collection. The data which were obtained from recordings of stimuli by the participants were transcribed impressionistically using phonetic transcriptions to identify the errors. The results showed that the most frequent type of pronunciation error produced by the participants was sound substitution (83% of the participants produced this error), while sound deletion and insertion were 67% and 63%, respectively. It was also found that they produced errors not only in pronouncing [v], [θ], [ð], [ʒ], [ʌ], [æ], [ɑ], [ɜ], [ɒ], [eɪ], [əʊ] but also in pronouncing [ɪə] as well as [t], [tʃ],[k], [b], [d], [dʒ], [j], [w], [ɪ], [ə] in certain positions. Furthermore, we found that the Indonesian phonological interference, the problem of the silent letter, pronouncing a word as it is spelt, overgeneralization, and hypercorrection were possible factors that contributed to the errors. In addition, the position of consonants also induced the participants to make errors in their pronunciation.

Keywords – EFL learners, pronunciation, error, consonant, vowel, interlingual, intralingual

INTRODUCTION

English is a global language that is taught as one of the foreign languages in Indonesia from elementary to university levels. In terms of sound inventory, English and Indonesian have some differences. English has 24 consonants,14 vowels, and 8 diphthongs (Ladefoged & Johnson, 2011, pp. 43-44) while Indonesian has only 10 vowels, 3 diphthongs, and 23 consonants (Chaer, 2013, pp. 14-15; Alwi, 2010, p. 67). This indicates that Indonesian has fewer consonants and vowels than English, which can potentially cause Indonesian learners of English to encounter difficulty in pronouncing English sounds and may result in pronunciation errors.

Errors are a flawed elementthat learners usually make either in speech or writing. They commonly emergethrough the language structure, morphology, and phonology foreign language learners use. This phenomenon is the area of error analysis (Dulay, Burt, & Karshen, 1982, p. 138). The present study is concerned with pronunciation errors, focusing on the types of pronunciation errors that are produced by Indonesian learners of English. In this case, we focus our analysis on the types of pronunciation errors proposed by Kenworthy (1987): sound substitution, sound deletion, and sound insertion.

Kenworthy (1987, p. 16) defines sound substitution as a sound thatis substituted for another sound. For example, learners of English as a foreign language may substitute the vowel [a] withthe vowel [ɔ] when pronouncing the word *cow* as [kɔʊ], which should be pronounced as [kaʊ]. Meanwhile, sound deletion refers to a case in which learners do not pronounce a certain sound which results in sound deletion. This occurs, for example, when learners do not pronounce the consonant [t] in the word *knocked* [nɑːk], which should be pronounced as [nɑːkt]. On the other hand, sound insertion can be defined as the addition of a sound which should not exist (Kenworthy, 1987, p. 17). This happens, for example, when learners of English pronounce the word*knife* as [knaɪf] instead of [naɪf]; that is,they add the consonant [k] in the word-initial position, probably because it appears in the spelling. Each type of these pronunciation errors can occur in the word-initial, medial, or final position.

Errors can occur due to severalfactors. One of the causes of errors produced by foreign language learners is proposed by Richard (1973, p. 19). He states thatthe interference of one's first language with the newly learned language can be a factor that may contribute to language learners' errors. Meanwhile, Keshavarz (2011) provides a broader idea about the causes of errors than Richard (1973, p.19); he suggests that interlingual and intralingual factors can contribute to errors. In this study, we submit

interlingual and intralingual explanationsas factors that may account for possible sources of pronunciation errors produced by Indonesian learners of English.

The interlingual error can be defined as the type of error that may result fromthe phonological, morphological, grammatical, lexico-semantic, and stylistic transfers of the learner's mother tongue to the learning of the target language. It deals with the language itself. Because this study is concerned with pronunciation errors, our analysis particularly focuses on phonological aspects that possibly contribute to pronunciation errors. Furthermore, the phonological level of interlingual source of errors refers to the learner's tendency to transfer the phonological features of their native language to those of the target language (Keshavarz, 2000, p. 121). On the other hand, intralingual error is the source of error that extends beyond an interlingual error in second language learning (Brown, 2000, p. 224). In this case, Keshavarz (2011, p. 125) divides intralingual error into overgeneralization, ignorance of rule restriction, false analogy, hyperextension, hypercorrection, and faulty categorization.

Since English as a foreign language also refers to the second language learning by English department students who also study this language intensively, we conducted this study by examining them. In this study, we chose the participants who studied at Universitas Trunojoyo Madurafor data collection convenience. In addition, thestudyalso aimed at providing data for the learners and lecturers about which English sounds are commonly mispronounced by the students. Having known their errors in pronouncing certain English sounds, it is hoped that the students will become motivated to improve their English pronunciation proficiency.

Based on the background above, this article attempts to answer two research questions, i.e., what types of pronunciation errors in English sounds are produced by the participants and which English sounds are commonly mispronounced by Indonesian learners of English. To answer the questions, we use the theory proposed by Kenworthy (1987, pp. 16-17) concerning the types of pronunciation errors, i.e., sound substitution, sound deletions, and sound insertions along with other relevant phonetic and phonological theories.In addition, we also wanted to find out possible causes of pronunciation errors produced by Indonesian second-language learners of English.

METHODS

This study is categorized as descriptive qualitative research since it aims to describe pronunciation errors in consonants and vowels produced by English learners as a

foreign language. In collecting the data, we applied a convenience sampling technique which is based on ease of access on the participants (Kothari, 2004, p. 15). The source of data for this study was twenty students of the English Department at Universitas Trunojoyo Madura. At the time of data collection, they were in the fifth semester. They were chosen since they are expected to have better competence in English pronunciation than their junior counterpartsas they have passed several courses in Speaking andEnglish phonetics and phonology. Even if they produce pronunciation errors, they still have the chance to study more about English pronunciation to improve their English proficiency when they continue their study at a higher level. The main instrument in qualitative research is the researcher (Khotari, 2004); however,in this study, there were also some instruments that we used to help us collect and analyze the data.

To collect the data, we useda list of English words containing the consonants [v], [θ], [ð], and [ʒ], and the vowels [ʌ], [æ], [ɑ], [ɜ], [ɒ], [eɪ], [əʊ], and [ɪə]. The consonants and vowels were determined based on the consonants and vowels inventory differences between Indonesian and English. We used them as stimuli for the participants to read in the experiment sessions. Before the experiment started, we also gave the participants time to get accustomed to the stimuli. We also asked them to have some practice with the stimuli. This is important as it could help them read the stimuli more naturally and fluently. After the participants were ready, they were instructed to read the stimuli as naturally as possible.We recorded the participants' pronunciations of the words to identify and scrutinize which English consonants and vowels they mispronounced. We transcribed them using an impressionistic approach, which was based on our auditory impressions (Hesselwood, 2013).Afterwards, we identified all of the errors and classified them into the types of errors based on the theory we mentioned previously. We further analyzed the errors to determine possible factors that contributed to each error.

FINDINGS AND DISCUSSION

This section presents the findings of the studyand discusses them using the relevant theories discussed in the introduction. Table 1 below demonstrates several English consonants and vowels which were mispronounced by the participants. The table also shows the types of pronunciation errors.

Table 1.Consonantsandvowelsmispronouncedbythe participants

Types ofPronunciationErrors	Consonantsand vowels change	Percentage	Examples ofEnglishwords examined	Samples ofpronunciationerrors
SoundSubstitution	[v] ->[f]	85%	nerve	[nɜ:v] ->[nɜ˞:f]
	[θ] -> [t^h], [t]	85%	theme	[θi:m]->[tim]
	[ð] ->[θ], [d], [t], [t^h]	100%	though	[ðoʊ]->[doʊ]
	[ʒ]-> [z],[dʒ], [tʃ]	95%	genre	[ʒɒnrə]->[zʌŋrə]
	[ʌ] ->[ɔ], [o]	59%	onion	[ʌnjən]-> [ɔnɪɔn]
	[æ], [ɛ], [e],[ə]	82%	act	[ækt]->[ɛk]
	[ɑ], [ɔ], [ɛ],[e]	100%	offal	[ɒfəl]->[ɔfəl]
	[ɜ], [ɛ], [ə],[ɪ]	100%	nervous	[nɜ:vəs]->[nɛrfəs]
	[ɒ], [o],[ɔ] [a], [ʌ]	100%	cloth	[klɒθ]->[klo:t]
	[eɪ], [i]and[ɪ]	58%	great	[greɪt]->[grit]
	[əʊ]/[oʊ]to [o], [ɔ],[ɒ]	89%	gross	[grəʊs]->[grɔs]
	[f] -> [s]	80%	marshmallow	[mɑʃmæləʊ]->[marsmelo]
	[dʒ] -> [tʃ]	95%	savage	[sævɪdʒ]->[sevetʃ]
	[j] -> [i],[ɪ]	100%	onion	[ʌnjən]->[ʌnɪən]
	[ɪ] ->[i]	75%	with	[wɪð]->[wit]
	[d]-> [t]	75%	aid	[eɪd]->[eɪt]
SoundDeletion	Final[t]	50%	knacked	[nækt]-> [nɛk]
	Middle [j]	85%	vacuously	[vækjuəsli]->[fɔkusli]
SoundInsertion	[k]ina certain word	43%	knave	[neɪv]->[knef]
	[b]ina certain word	100%	plumber	[plʌmər]->[plʌmbər]
	Initial[w]	70%	wraith	[reɪθ]->[wreɪt]
	[ə] before aconsonant	74%	romantically	[rəʊmæntɪkli]->[rɔmantikəli]

Table 1 shows the types of pronunciation errors produced by the participants; they include sound substitution, sound deletion, and sound insertion. As we can see, the most frequent type of pronunciation errorin consonants produced by the participants is sound substitution which makes up 83 % of the errors. Meanwhile, sound insertion and deletion compriserespectively 67% and 63% of the total pronunciation errors. When conducting this research, we focused our examination on English words containing the consonants [v], [θ], [ð], and [ʒ], and the vowels [ʌ], [æ], [ɑ], [ɜ], [ɒ], [eɪ], [əʊ], and [ɪə]. Surprisingly, however, we found that the participants also made errors in pronouncing the consonants [t], [f], [k], [b], [d], [dʒ], [j], and [w] and the vowels [ɪ], [ə] in certain positions in words(see Table 1).

As shown in Table 1, the most frequent error type produced by the participants is when pronouncing the voiced dental fricative consonant [ð] in the initial, medial, and final

positions. We can see that most of the participants produced errors in pronouncing this consonant. Meanwhile, the voiced palatal approximant [j] in the medial position is also found to be the most common errorin consonant pronunciation made by the participants since it is pronounced almost similarly to the near-close front unrounded vowel [ɪ]. This can be seen in Table 1 that allof the participants substituted this consonant withthe vowel [ɪ], particularly in the medial position. Likewise, the voiced post-alveolar fricative consonant [ʒ] ranks as the second most common error in consonant pronunciation produced by the participants following [ð]. It demonstrates that 95% of the participants madeerrors in pronouncing this consonant. In addition, the voiced palatal affricate [dʒ] in the final position also ranks as the second most commonconsonant substituted by the participants. As we can see in the table, 95% of the participants substitutedthe consonant [dʒ] withthe voiceless palatal affricate consonant [tʃ]in the final position.

In terms of vowel pronunciation, Table 1 shows that the open-back unrounded vowel [ɑ] (commonly used in American English) and the open-back rounded vowel [ɒ] (commonly used in British English) were the most difficult vowels to be pronounced by the participants. We can see that most of the participants substituted them with other vowels as well (this will be discussed further in the next section). Likewise, many participants also have difficulty pronouncing the diphthong [əʊ]. This can be seen in Table 1 where 89% of them substituted the diphthong witha monophthong.

The other important findings of the present study were sound deletion and sound insertion in the participants' pronunciations. Table 1 shows that 50% of the participants deleted the voiceless dental plosive consonant [t] when it occurs in the word-final position, while 85% of them deleted the voiced palatal approximant [j] in the medial position. The idea of sound insertion in this study was found because the participants tend to pronounce silent letters which only exist orthographicallyrather than phonemically or phonetically. It is indicated by the finding that most of the participants inserted the voiced bilabial plosive consonant [b] when pronouncing the word *plumber* (which should be pronounced as [plʌmər] instead). They also inserted the mid-central unrounded vowel [ə] in pronouncing the word *romantically* (which should be pronounced as [rəʊmæntɪkli]), inserted the voiced labial-velar approximant [w] in the initial position, and inserted [k] in word-initial position when pronouncing *knave* (which should be pronounced as [neɪv]). This shows that they pronounced silent letters which only exist orthographically rather than phonemically in English.

We also found that the errors made by the participants were possibly caused by two factors, i.e., interlingual and intralingual factors. In matters of interlingual errors, we

found some possible causes of errors came from the way by which the participants pronounced English words. Specifically, these errors are probably caused by some Indonesian phonological interference, the positions of consonants and vowels, the problem of the silent letter, and pronouncing the word as it is spelt. Furthermore, we also found that overgeneralization and hypercorrection as the intralingual factor that contributed to errors.

As we can see in Table 1, the most frequent errorin consonant pronunciation produced by allparticipants is the substitution of the voiced dental fricative consonant [ð] withthe voiced dental plosive [d]. The table also shows other consonants and vowelsubstitutions. Such substitutions may occur since Indonesian does not have some consonants and vowels which are available in English. In pronouncing the consonants and vowels which are not available in the Indonesian consonant inventory, the participants mostly substituted them withthe consonants and vowels that exist in the Indonesian consonant and vowel inventory. That is Indonesian consonants and vowels which sound almost similar to their English counterparts.

Another important finding in this study is the problem of the silent letter. This is also categorized as an interlingual error because it deals with the language and causes the participants to produce errors in pronouncing English words. The resultshows that this problem occurs when the participants pronounced the words *romantically* [rəʊmæntɪkli], *wraith* [reɪθ], and *plumber* [plʌmər]. Instead of pronouncing it *romantically* as [rəʊmæntɪkli], some participants pronounced it [rɔmantikəli]. They inserted a schwa (the mid-central unrounded vowel[ə]) which should be omitted before the lateral consonant [l]. Furthermore, the participants pronounced *wraith* by inserting the voiced labial-velar approximant [w] in the initial position as [wreɪt]. In pronouncing the word *plumber*, all of them inserted the voiced bilabial plosive [b] after the voiced bilabial nasal [m], which is, in this case, pronounced as [plambər]. The vowel [ə], the glide [w], and the consonant [b] in those words are categorized as silent letters which exist only orthographically rather than phonemically or phonetically. Thus, this contributes to the participants' errorproduction.

Pronouncing the word as it is spelt also one of the causes of errors produced by the participants. This case is shown by the finding that 8 out of 20 participants pronounced the word *stir*[stɜr] as [stɪr]. Besides, 9 out of 20 participants pronounced *with* [wɪð] as [wit], 12 out of 20 participants pronounced *cloth* [klɒθ] as [klot], and 8 out of 20 participants pronounced the word *involve* [ɪnvɒlv] as [ɪnfolf] (see Appendix for more on this).

However, the Indonesian phonological interference, the problem of silent letters, and pronouncing the word as it is spelt are not the only sources of interlingual errors produced by the participants; the position of consonants in English words also becomes a

problem for the participants. This study found that the position of consonants in English words also influences the way the participants pronounced English words. This case is shown by the finding that 16 out of 20 participants mispronounced the voiced alveolar plosive [d] in the final position in the word *aid*. Since the consonant [d] is available in the Indonesian consonant inventory, the participants are expected to pronounce it correctly. However, when the consonant [d] occurs in the final position, 75% of the participants substituted it withthe voiceless alveolar plosive [t]. This type of error pronunciation is probably because voicing in Indonesian is never distinctive word-finally. This means that we cannot find minimal pairs in Indonesian in which words are different because one ends in a voiced consonant while the other ends in a voiceless consonant. In addition, the participants also have difficulty pronouncing the voiced palatal approximant consonant [j]. It is indicated by all of the participants substitutingthe consonant [j] in the medial position to the close front unrounded vowel [i] and the near-close frontunrounded [ɪ] in the word *onion*.

Likewise, 18 participants also mispronouncedthe voiced palatal affricate consonant [dʒ] which occurs in the final position. The finding shows that in pronouncing the word *savage* [sævɪdʒ], for example, 15 out of 20participants substitutedthe consonant [dʒ] in the word-final position with the voiceless palatal affricate [tʃ], and3 out of 20 participants substituted [dʒ] to the voiceless velar plosive [k] (see Appendix for more on this finding). These findings demonstrate that even though those consonants are available in the Indonesian consonant inventory, the position of the consonant in the word determines whether or not it can confuse how the learner pronounces it. That is, as discussed previously, this is because voiced consonants never occur in the word-final position in Indonesian.

Furthermore, overgeneralization refers to errors in different structures produced by the learners because of their inadequate knowledge of and acquaintance with other structures of the target language (Keshavarz, 2011, pp. 125-126). This error refers to the act of exaggerating pronunciation which suggests that all words are pronounced in such a way that they become mispronounced. The idea of overgeneralization occurs when the participants overgeneralize some English consonants and vowels because of their lack of knowledge. This study also found that 8 out of 20 participants wrongly pronouncedthe word *though*. We found that some English words that end in *-gh* are pronounced as the voiceless labiodental fricative [f] such as in the word *laugh* [læf]. This fact causes the participants to pronounce *though* which should be pronounced as [ðoʊ] (without final [f]) as [doʊf] (with final [f]). Another case occurs when the participants pronouncedthe word

garage. Instead ofpronouncing the word [gəraʒ] (endingin[ʒ]), 13 out of 20 participants pronounced it as [gəredʒ] (ending in [dʒ]). This occurs since the participants overgeneralize that the letter *g* in English is pronounced as the voiced palatal affricate [dʒ] (see Appendix for more on this).Likewise, the result of this study also shows that 13 out of 20 participants pronounce the word *avocado* (which should be pronounced as [ævəkɑdoʊ]) as [əfokedo] (see Appendix). They substituted the open-back unrounded vowel [ɑ] forthe close-mid front unrounded vowel [e] in the medial position. This also occurs since the participants overgeneralize the letter*a* in English words to be always pronounced as the close-mid front unrounded vowel [e].

Another intralingual aspect that contributes to errors produced by the participants is hypercorrection, which is a phenomenon that usually occurs when the speaker of a non-native language uses the standard language variety of nativespeakers. In this particular case, the speaker may produce a type of pronunciationthat does not occur in the standard variety of a target language (Keshavarz, 2011, p.127). In other words, hypercorrection refers to errors of pronunciation caused by expecting correct pronunciation excessively but then ending up in errors. This case is shown when pronouncing the word *gross,* which should be pronounced as [grəʊs], 18 out of 20 participants substitutedthe diphthong [əʊ] to the monophthongs [o], [ɔ], [ɒ] (see Appendix). Furthermore, 16 out of 20 participants substitutedthe near-close front unrounded vowel [ɪ] in the word *thither*withthe close front unrounded vowel [i] (see Appendix). In addition, 19 out of 20 participants substituted the open-mid central unrounded vowel [ɜ] withthe mid-central unrounded vowel [ə] when pronouncing the word *nervous*.

In this study, sound substitution is found to be the most frequent type of pronunciation error produced by the participants (83%). This error type is more frequent than sound deletion and sound substitution, which are 67% and 60%, respectively. We initially focused on examiningthe English consonants [v], [θ], [ð], [ʒ], and the vowels [ʌ], [æ], [ɑ], [ɜ], [ɒ], [eɪ], [əʊ], [ɪə] to uncover the types of errors that the participants made. However, after doing further analysis, we found that the participants also produced errors in pronouncing the consonants [t], [f], [k], [b], [d], [dʒ], [j], and [w] as well asthe vowels [ɪ] and [ə].

Theresults of the study also demonstrate that the errors produced by the participants occur because of several possible reasons. In this case, interlingual and intralingual errors are the possible causes of pronunciation errors produced by the participants. Dealing with interlingual errors, Indonesian phonological interference, and the problem of the silent letter appear to be the causes of pronunciation errors produced by the

participants. In addition, we also found that certain positions of consonants in English words are suggested to be indicative of the possible source of errors. In matters of intralingual errors, we found that the participants produced errors because of overgeneralization and hypercorrection in pronouncing certain English consonants and vowels.

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Appendix

Words	TargetPronunciation		Samples ofobservedPronunciation	Number ofparticipants(whoproduceerrors)	Percentage
	BrE	AmE			
[v]					
Vacuously	[**v**ækjuəsli]	[**v**ækjuəsli]	[**f**ɛkʊosli]	16	85%
Vaccinate	[**v**æksɪneɪt]	[**v**æksɪneɪt]	[**f**asinet]	18	
Proven	[pru**v**ən]	[prəʊ**v**ən]	[prʊ**f**ən]	8	
Savage	[sæ**v**ɪdʒ]	[sæ**v**ɪdʒ]	[se**f**etʃ]	16	
Achieve	[ətʃi**v**]	[ətʃi**v**]	[ətʃi**f**]	20	
Nerve	[nɜ:**v**]	[nɝ:**v**]	[nɝ:**f**]	20	
Survey	[sɜ:**v**eɪ]	[sɝ:**v**eɪ]	[sɝ**f**eɪ]	20	
Knave	[neɪ**v**]	[neɪ**v**]	[kneɪ**f**]	19	
Nerve	[nɜ:**v**əs]	[nɝ:**v**əs]	[nɛr**f**əs]	17	
Involve	[ɪn**v**ɒl**v**]	[ɪn**v**ɑ:l**v**]	[ɪn**f**ol**f**]	20	
[θ]					
Theme	[**θ**i:m]	[**θ**i:m]	[**t**im]	13	85%
Thoracic	[**θ**ɔ:ræsɪk]	[**θ**ɔ:ræsɪk]	[**t**ɔrɛkik]	15	
Athlete	[æ**θ**li:t]	[æ**θ**li:t]	[a**t**lit]	18	
Method	[me**θ**əd]	[me**θ**əd]	[me**t**ɔt]	17	
Youth	[ju:**θ**]	[ju:**θ**]	[jɔ**t**]	12	
Theorem	[**θ**ɪərəm]	[**θ**i:ɚəm]	[**t**eorəm]	12	
Wraith	[reɪ**θ**]	[reɪ**θ**]	[wreɪ**t**]	17	
Girth	[gɜ:**θ**]	[gɝ:**θ**]	[gir**t**]	11	
Cloth	[klɒ**θ**]	[klɑ:**θ**]	[klo:**t**]	17	
[ð]					
Thither	[**ð**ɪð**ð**ər]	[**ð**ɪð**ð**ɚ]	[**t**i**t**ər]	20	100%
Unfathomable	[ʌnfæ**ð**əməbl]	[ʌnfæ**ð**əməbl]	[anfa**t**omɛbəl]	20	
Breather	[bri:**ð**ər]	[bri:**ð**ɚ]	[bri:**d**ər]	20	
Smooth	[smu:**ð**]	[smu:**ð**]	[smʊ**t**]	20	
Though	[**ð**əʊ]	[**ð**oʊ]	[**θ**oʊ]	20	
With	[wɪ**ð**]	[wɪ**ð**]	[w**it**]	20	
[ʒ]					
Genre	[**ʒ**ɑ:rə]	[**ʒ**ɒnrə]	[**ʒ**ɛnər]	19	95%
Conclusion	[kənklu:**ʒ**ən]	[kənklu:**ʒ**ən]	[kɔŋklʊ**ʃ**ən]	19	
Measure	[me**ʒ**ər]	[me**ʒ**ɚr]	[mi:**z**ər]	20	
Beige	[beɪ**ʒ**]	[beɪ**ʒ**]	[beɪ**tʃ**]	20	
Rough	[ru:**ʒ**]	[ru:**ʒ**]	[rɔ:**tʃ**]	17	
[ʃ]					
Marshmellow	[mɑ:**ʃ**mæləʊ]	[mɑ:r**ʃ**mæloʊ]	[mar**s**melo]	16	80%
[k]					
Ache	[eɪ**k**]	[eɪ**k**]	[e**tʃ**]	13	65%
[d]					
Aid	[eɪ**d**	[eɪ**d**]	[eɪ**t**]	15	75%
[dʒ]					

Savage	[sævɪ**dʒ**]	[sævɪ**dʒ**]	[sefe**tʃ**]	19	95%
[j]					
Union	[ʌn**j**ən]	[ʌn**j**ən]	[ʌn**ɪ**ən]	20	100%
[æ]					
Fiat	[fi:**æ**t]	[fi:**æ**t]	[fa**ɪ**ət]	19	82 %
Knacked	[n**æ**kt]	[n**æ**kt]	[n**ɛ**k]	20	
Act	[**æ**kt]	[**æ**kt]	[**ɛ**k]	13	
Ankle	[**æ**ŋkl]	[**æ**ŋkl]	[**ɛ**ŋkəl]	13	
kaftan	[kæftæn]	[kæftæn]	[kæftən]	20	
Understand	[ʌndəst**æ**nd]	[ʌndəst**æ**nd]	[andəst**æ**n]	12	
Vacuously	[v**æ**kjuəsli]	[v**æ**kjuəsli]	[f**ɛ**k**ʊ**osli]	11	
Vaccinate	[v**æ**ksɪneɪt]	[v**æ**ksɪneɪt]	[f**a**sinet]	16	
Savage	[s**æ**vɪdʒ]	[s**æ**vɪdʒ]	[se**f**etʃ]	19	
Thoracic	[θɔ:r**æ**sɪk]	[θɔ:r**æ**sɪk]	[tɔr**ɛ**kik]	16	
Athlete	[**æ**θli:t]	[**æ**θli:t]	[**a**tlit]	14	
Unfathomable	[ʌnf**æ**ðəməbl]	[ʌnf**æ**ðəməbl]	[anf**a**tom**ɛ**bəl]	20	
Romantically	[rəʊm**æ**ntɪkli]	[rəʊm**æ**ntɪkli]	[rəm**a**ntikəli]	20	
[ʌ]					
Accomplish	[ək**ʌ**mplɪF]	[ək**ɑ**:mplɪF]	[ək**ɔ**mplis]	20	59%
Plumber	[pl**ʌ**mər]	[pl**ʌ**mər]	[pl**ʌ**mbər]	7	
Onion	[**ʌ**njən]	[**ʌ**njən]	[**ɔ**nɪən]	13	
Colombia	[kəl**ʌ**mbiə]	[kəl**ʌ**mbiə]	[kol**o**mbia]	20	
Enough	[ɪn**ʌ**f]	[ɪn**ʌ**f]	[in**a**f]	4	
Above	[əb**ʌ**v]	[əb**ʌ**v]	[ab**ɔ**f]	4	
Understand	[**ʌ**ndəstænd]	[**ʌ**ndəstænd]	[**a**ndəstæn]	6	
Unfathomable	[**ʌ**nfæðəməbl]	[**ʌ**nfæðəməbl]	[**a**nfatom**ɛ**bəl]	20	
[ɑ]					
Offal	[**ɒ**fəl]	[**ɑ**fəl]	[**ɔ**fəl]	20	100%
Avocado	[ævək**ɑ**:dəʊ]	[ævək**ɑ**:doʊ]	[əfok**e**do]	20	
Colorado	[kɒlər**ɑ**:dəʊ]	[kɒlər**ɑ**:doʊ]	[kolor**e**do]	20	
Garage	[gær**ɑ**:ʒ]	[gər**ɑ**:ʒ]	[ger**e**:dʒ]	20	
Guitar	[gɪt**ɑ**:r]	[gɪt**ɑ**:r]	[gʊɪt**ʌ**r]	20	
[ɒ]					
Dermatology	[dɜ:mət**ɒ**lədʒi]	[dɜ:mət**ɒ**lədʒi]	[dermat**o**lodʒi]	20	100%
Logically	[l**ɒ**dʒɪkli]	[l**ɑ**:dʒɪkli]	[l**ɔ**dʒikəli]	20	
Body	[b**ɒ**di]	[b**ɑ**:di]	[b**a**di]	20	
Cloth	[kl**ɒ**θ]	[kl**ɑ**:θ]	[kl**o**:t]	20	
Restaurant	[restr**ɒ**nt]	[restər**ɑ**:nt]	[rɛstor**a**n]	20	
Involve	[ɪnv**ɒ**lv]	[ɪnv**ɑ**:lv]	[ɪnf**o**lf]	20	
[ɜ]					
Nervous	[n**ɜ**:vəs]	[n**ɜ˞**:vəs]	[n**ɛ**rfəs]	7	75%
Girth	[g**ɜ**:θ]	[g**ɜ˞**:θ]	[g**i**rt]	17	
Certify	[s**ɜ**:tɪfaɪ]	[s**ɜ˞**:təfaɪ]	[s**ɜ˞**tɪfʌɪ]	4	
Stir	[st**ɜ**:r]	[st**ɜ˞**:]	[st**ɪr**]	19	
Entrepreneur	[ɒntrəprən**ɜ**:r]	[ɑ:ntrəprən**ɜ˞**:]	[ɛtə˞pren**e**r]	18	

Connoisseur	[kɒnəs**ɜ**:r]	[kɑ:nəs**ɜ˞**:]	[kɔnes**ɪ**ur]	20	
Dermatology	[dɜ:mətɒlədʒi]	[dɜ:mətɒlədʒi]	[d**e**rmatolodʒi]	20	
[ɪ]					
Vaccinate	[væksɪneɪt]	[væksɪneɪt]	[fas**i**net]	18	

Savage	[sævɪdʒ]	[sævɪdʒ]	[sef**e**tF]	19	75%
Thoracic	[θɔ:ræsɪk]	[θɔ:ræsɪk]	[tɔrɛk**i**k]	16	
Thither	[ðɪðər]	[ðɪðɚ]	[t**i**tər]	16	
With	[wɪð]	[wɪð]	[w**i**t]	19	
Accomplish	[əkʌmplɪF]	[əkɑ:mplɪF]	[əkɔmpl**i**s]	19	
Enough	[ɪnʌf]	[ɪnʌf]	[**i**naf]	11	
Involve	[ɪnvɒlv]	[ɪnvɑ:lv]	[**i**nfof]	5	
Romantically	[rəʊmæntɪkli]	[rəʊmæntɪkli]	[rɔmant**i**kəli]	15	
Logically	[lɒdʒɪkli]	[lɑ:dʒɪkli]	[lodʒ**i**keli]	20	
Guitar	[gɪtɑ:r]	[gɪtɑ:r]	[g**i**tʌr]	7	
[eɪ]					
Great	[greɪt]	[greɪt]	[gr**i**t]	19	58%
Knave	[neɪv]	[neɪv]	[kn**e**f]	20	
Aid	[eɪd]	[eɪd]	[**e**t]	7	
Ache	[eɪk]	[eɪk]	[**e**tʃ]	14	
Survey	[sɜ:veɪ]	[sɜ˞:veɪ]	[sɜ˞fʌɪ]	1	
today	[tədeɪ]	[tədeɪ]	[tʊdeɪ]	0	
Wraith	[reɪθ]	[reɪθ]	[rɪt]	13	
potato	[pəteɪtəʊ]	[pəteɪtoʊ]	[pot**e**to]	18	
Beige	[beɪʒ]	[beɪʒ]	[b**i:** tʃ]	13	
[əʊ]					
Romantically	[rəʊmæntɪkli]	[rəʊmæntɪkli]	[rɔmantikəli]	20	89%
Scenario	[sɪnɑ:riəʊ]	[sənerioʊ]	[skenari**o**]	20	
Gross	[grəʊs]	[groʊs]	[grɔs]	20	
Roll	[rəʊl]	[roʊl]	[rɔl]	20	
Marshmallow	[mɑ:Fmæləʊ]	[mɑ:rFmæloʊ]	[marsmel**o**]	9	
Potato	[pəteɪtəʊ]	[pəteɪtoʊ]	[potet**o**]	18	
[ɪə]					
Really	[rɪəli]	[rɪəli]	[rɪli]	19	63%
Year	[jɪər]	[jɪr]	[jər]	17	
Material	[mətɪəriəl]	[mətɪriəl]	[mat**e**rɪəl]	20	
Ear	[ɪər]	[ɪr]	[ɪər]	0	
Area	[eərɪə]	[erɪə]	[ar**ea**]	20	
Here	[hɪər]	[hɪr]	[hɪər]	0	
PercentageofSoundSubstitution					**83%**