

GENDER AND ACCENT IN THE PERCEPTION OF ENGLISH SYLLABIC CONSONANTS VS. SCHWA

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Abstract: *This paper reports a study on the perception of English syllabic consonants vs. schwa in word final position at discourse level. Our aim is to find out whether gender and accent play a significant role in the perception of potential syllabic consonants, a topic which needs further research (see Takefuta & Black 1966; Bloom, Moore-Schoenmakers & Masataka 1999). Three females identified a schwa/syllabic consonant in 800 words uttered in specific contexts by 80 non-rhotic native newsreaders (40m/40f) from the BBC Learning English Website. The statistical procedures used were the contingency table analysis and Kendall's correlation coefficient. The study reveals that gender and accent do not perform a significant role in the perception of this alternation. They were found not to influence the referees' perception, their degree of agreement being quite similar in the categories of each variable. The exploration of the schwa vs. syllabic consonant perception in terms of word position (within an utterance) and word emphasis is suggested.*

Keywords: *English potential syllabic consonants, gender, accent, discourse, perception, BBC speech.*

1. INTRODUCTION

The ubiquitousness of syllabic consonants and the schwa in English speech combined with the lack of agreement among phoneticians regarding their usage (Gimson 1970, Álvarez 1980) make them an eligible topic for further research. One aspect which needs to be explored is the behaviour of this alternation in connected speech, at discourse level, given that most studies have dealt with them at word level (Monroy 1980, Roach 2000). If the production of potential syllabic consonants is lacking in research, the case of their perception is even more limited as far as investigation is concerned. As pointed out by Roach (2002: 75), "this area needs attention". It is our aim to find out whether the role played by gender and accent in the schwa vs. syllabic consonant perception is significant. In particular, we are interested in knowing the degree of concordance amongst the referees for the categories in each variable and whether these factors affect the listeners' perception.

2. LITERATURE REVIEW

Some research into syllabic consonants and the schwa has been conducted but mostly synchronic and concentrated on their formation. In languages other than English, we find Coleman (1999 2001) for syllabic consonants in Berber; and Barry (1995) for the schwa in German. In English, the controversy around the phonemic status of syllabic consonants goes back to the sixties (Cohen 1957, Wells 1965, Gimson 1970). Conflicting theories and rules have been formulated more recently on the phonemic context of syllables alternating apparently syllabic consonants and schwa (Monroy 1980, Roach 2000, Wells 2000). Monroy's rules (2008–2009) try to capture the behaviour of syllabic consonants vs. schwa in word final position, claiming that

they follow fairly clear distributional patterns rather than occurring haphazardly. He assigns one pronunciation to each rule. Rules 1, 2, and 4 apply equally to all the consonants liable to be syllabic or preceded by a schwa: /m/, /n/, /ŋ/, /l/, /r/. In contrast, rule 3 applies only to nasals: /m/, /n/, /ŋ/. In our study we take these rules as a starting point (they are listed below).

1ST RULE: Syllabic consonant
 V (stressed) + C (except for r, l, m, b, g) + V (weak) + C (m, n, ŋ, l, r)
 Examples: lesson, people

2ND RULE: Schwa
 V (stressed) + C (r, l, m, b, g) + V (weak) + C (m, n, ŋ, l, r)
 Examples: melon, lemon, organ, ribbon.

3RD RULE: Schwa
 V (stressed) + N¹/NN + V (weak) + N/N + Hom²
 OR
 V (stressed) + N+ Hom/Hom + N/Plos.+ N/N + Plos. +V (weak) + N (+ Hom)
 Examples: London, Clinton, Camden, cannon, human, diamond.

4TH RULE: Schwa
 V (stressed) + C + V (weak) + C (m, n, ŋ, l, r) C
 OR
 V (stressed) + CC + V (weak) + C (m, n, ŋ, l, r)
 Examples: symbol, present, patient

The behaviour of syllabic consonants and the schwa can be studied by means of a perceptual analysis besides acoustically (see, for instance, Lehiste 1964, Álvarez 1980, Töft 2002, for acoustic studies on syllabic consonants). Van Bergem (1995) mentions the effect that factors such as the frequency of occurrence of words and speaking styles may have on production as seen from the listeners' standpoint – but it addresses full vowels as against the schwa, and in relation to Dutch.

It is important to analyse perception in greater depth, not only as a means to explore speech production, but also as an end in itself, because it is the listener who perceives sounds in real-life speech. There are studies on speech perception in general terms, e.g. Diehl, Lotto & Holt (2004), and languages other than English, such as Chinese, French, Icelandic, Hindi, etc. Xiaonan & Maocan (1992) exemplify a Chinese study on tonal perception and again van Bergem (1995) aims to know whether listeners are able to unambiguously distinguish between full vowels and schwa in Dutch. In the case of English, we find a study on the perception of lateral and nasal syllabic resonants (García, 2006) but it involves synthetic speech stimuli. Most of the perceptual studies in English focusing on samples of real language deal with phonetic aspects other than

¹ N stands for Nasal.

² Hom stands for Homorganic.

syllabic consonants and the schwa. For instance, Schaeffer & Eichorn (2001) explore the effect that factors such as vowel duration and context exert on the listeners' perception of naturalness in sentences. This is achieved by exploring the listeners' degree of agreement.

As for the factors we are dealing with in this paper, we find a study which involves syllabic consonants and gender in terms of perception but it has a different focus: Bloom, Moore-Schoenmakers & Masataka (1999) intend to explore why boys pronouncing syllabic consonants are better rated than girls. It is found to be so because of nasality in the girls' speech. There is some research into the perception of accent (Takefuta & Black, 1966) but nothing has been done as to the possible effect this factor may exert on the listeners' perception of phonemes and, in particular, syllabic consonants vs. schwa.

3. GOALS AND RESEARCH QUESTIONS

The main objective in this research project is to study the perception of English syllabic consonants and the schwa in word final position at discourse level. In particular, we aim to provide answers to the following research questions which, in turn, include two subquestions:

1. Does gender play a significant role in the perception of English syllabic consonants and the schwa?
 - a) Which is the degree of agreement amongst the listeners found for each category of the variable?
 - b) Does gender affect the referees' perception?
2. Does accent³ perform a significant role in the perception of English syllabic consonants and the schwa?
 - a) Which is the degree of agreement amongst the referees found for each variant of the variable?
 - b) Does accent have an influence on the listeners' perception?

Concerning the variables, the perception of English syllabic consonants and the schwa, that is, the dependent variable, will be studied in terms of two different independent variables: gender and accent. All the variants of these variables are clearly indicated in Appendix 4.

4. METHODOLOGY

The informants were 80 newsreaders (40 male and 40 female) from the BBC Learning English Website (2009) who spoke non-rhotic native English (RP, Northern, Welsh, Antipodean⁴ and African⁵). The instruments were a corpus of written and recorded 1999–2008 news and some questionnaires:

³ Roach (2002:3) defines accent as the "prominence given to a syllable, usually by the use of pitch" (emphasis in original). He also defines it in a sociolinguistic sense, which we are using in this study, referring to "a particular way of pronouncing" (p.3). For example, Scottish and Welsh people speak English and they share its grammar and vocabulary, but their way of pronouncing English is different. Carr (1999) and Roach (2002) highlight the difference between accent and dialect. Unlike accents, dialects usually have differences amongst themselves in terms of grammar and vocabulary.

⁴ According to the Compact Oxford English Dictionary (2009), this adjective is used to describe the people or things that come from or relate to "Australia and New Zealand (in relation to the northern hemisphere)" if Greenwich (Britain) is taken as a reference point. Bear in mind that the word comes from Greek antipodes, which means "having the feet opposite". Crawford (2008) states that before the 1990s and 2000s the term was limited to people from Australia and New Zealand. Later on it became extended to South Africans, but this is not a widespread usage, as may be guessed from the above definition, which excluded South Africans. However, in our study, when we refer to Antipodeans, we also include the latter.

⁵ The category African is qualified with a? since the newsreader in question had some features of African pronunciation – she was possibly Nigerian –, but her accent in general approximated RP.

- 1) pre-task, aimed to obtain background information from the possible listeners and provide the basis for our choice of actual listeners (see Appendix 1),
- 2) task, aimed at the identification of a syllabic consonant or a schwa finally in a word as well as the recognition of the speaker's accent (see Appendix 2), and
- 3) post-task, intended to "ensure the truth value of (...) data" (Creswell, 2001: 199), amplify on the information provided by the listeners and give prompts for further research (see Appendix 3). For the recording of material, we used the software Audacity.

The study was conducted over four months in 2009. After we had selected 80 non-rhotic English newsreaders (random sampling) and we had checked text and audio, we chose 800 words (10 per newsreader), representative of each of the four rules formulated by Monroy (2008-2009). We wrote and recorded each word and its context. From the pre-task questionnaire, and in order to avoid bias, we chose three homogeneous naïve listeners: female, young, British, educated and with a reasonable good ear (especially musically speaking). They differed in their knowledge of phonetics (two of them were experienced in English phonetics) and, to an extent, in their accent. They were emailed the task questionnaire of each speaker and the audio files (including words and context). Afterwards, we transcribed all the information into an Excel document. We then realised that all the listeners agreed amongst themselves as far as the speakers' accent was concerned and we confirmed their replies (when it was possible to do so) with further information from the internet. For instance, Female 6 (Jane Little) was said by the referees to have a Northern accent, which was confirmed by our ascertaining that she was born and raised in Kendall, Cumbria (BBC radio 4 2008). We created common categories from the listeners' replies. While statistically analysing, we sent the listeners the post-task questionnaire.

5. DATA ANALYSIS

The data from the Excel document were analysed by means of the statistical package SPSS 15.0 for Windows. The statistical procedures used were the contingency table analysis (percentage/frequency distributions) and Kendall's correlation coefficient (*W*). In the latter there were no assumptions to be met due to its being non-parametric. The threshold of significance was the usual one: $\alpha = 0.05$. Due to their low frequency of occurrence, we were obliged to group some of the categories of the variables on the basis of similarity of category (see Appendix 4 for the original and grouped categories). The contingency table analysis was used to establish the degree of dis/agreement amongst the listeners in the variants of each factor: gender and accent. Kendall's *W* was adopted in order to know whether agreement amongst the referees was statistically significant for each category of the variable as well as to find out whether there were statistically significant differences between the categories. Having carried out the analysis in SPSS, we coded the qualitative answers to the post-task questionnaire in view of the categorical analysis.

6. RESULTS AND DISCUSSION

We will now discuss the findings in view of the research questions we have aimed to answer. If we take gender into account, the results from the contingency table analysis show that the listeners' agreement for males is very similar to that found for females (around 60% of disagreement and 40% of concordance), as seen in Table 1 and Figure 1. This suggests that being male or female does not make any difference in the referees' perceptions. In other words, the listener does not find it easier to perceive syllabic consonants and the schwa when produced by a man than a woman, and vice versa.

ACUERDO GLOBAL					
SEX		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
F Válidos	No Acuerdo	241	60.3	60.3	
	Acuerdo 3 listener en S y W	159	39.8	39.8	60.3
	Total	400	100.0	100.0	100.0
M Válidos	No Acuerdo	243	60.8	60.8	
	Acuerdo 3 listener en S y W	157	39.3	39.3	60.8
	Total	400	100.0	100.0	100.0

Table 1. Disagreement and agreement amongst the listeners in terms of gender (percentages and frequencies).

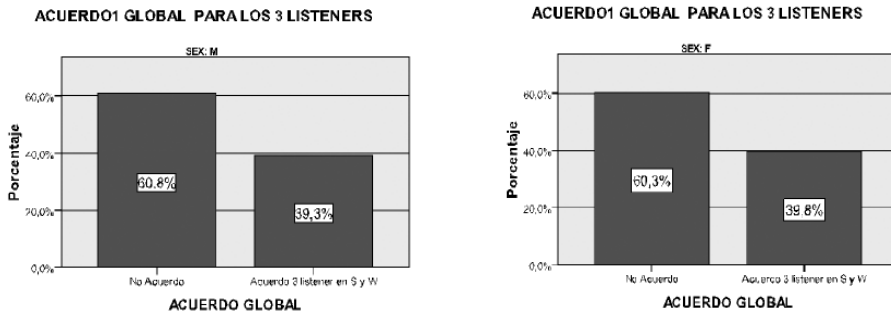


Figure 1. Disagreement and agreement amongst the listeners in terms of gender (%)

Kendall's tau rank correlation coefficient (W) reveals that for the category female of the variable gender (W ($df = 2$) = 0.131 with $p < 0.05$), agreement amongst the referees is found to be statistically significant. The same applies to the category male (W ($df = 2$) = 0.191 with $p < 0.05$). The results are very similar between the categories female and male within the variable gender, so there are no significant differences between them. Therefore, statistically speaking, the variable gender does not have an influence on the listeners' perception (see Table 2).

Estadísticos de contraste		
F	N	394
	W de Kendall ^a	.131
	Chi-cuadrado	103.311
	gl	2
	Sif.asintót.	.000
M	N	398
	W de Kendall ^a	.191
	Chi-cuadrado	151.643
	gl	2
	Sif.asintót.	.000

^aCoefficiente de concordancia de Kendall

Table 2. Kendall's correlation coefficient in terms of the listeners' agreement taking gender into account.

With respect to accent, we observe that, despite being quite similar, agreement amongst the listeners for non-RP is found to be 8.5% higher than for RP accents (see the contingency table analysis in Table 3 and Figure 2). This is of interest if we consider that the three listeners are used to RP features (L.F1. and L.F3. are of Scottish origin, but they are almost RP native, and L.F2. speaks RP with some regional features) (see Appendix 1). It may be precisely because of that regular contact with RP that the referees find it harder to decide on a phoneme in words pronounced with that accent, more than in the case of non-RP phonemes, with which they are less related. This idea may be linked with one familiar example: when someone repeatedly reads or hears something in order to arrive at some conclusions, it would be advisable that he/she leaves the task aside for some time because it is likely that he/she becomes overwhelmed. Something similar may occur when there is a regular exposure to a given accent. In addition, as the listeners themselves admit (see Appendix 3), they do not pay attention to phonemes when talking or listening to people in everyday life. In any case, it must be stated that the difference between RP and non-RP results are not acute, as seen below, maybe due to the fact that two of the listeners, L.F1 and L.F2, are knowledgeable about phonetics. They may find it easier to cope with phonemes, in general terms, irrespectively of whether they are RP or non-RP, because they have studied them. Should there be more listeners naïve in phonetics, the difference between these two accents might have been more significant.

ACUERDO GLOBAL							
ACCENT2				Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
no RP	Válidos	No Acuerdo		77	53.5	53.5	53.5
		Acuerdo 3 listener en S y W		67	46.5	46.5	100.0
		Total		144	100.0	100.0	
no RP	Válidos	No Acuerdo		407	62.0	62.0	62.0
		Acuerdo 3 listener en S y W		249	38.0	38.0	100.0
		Total		656	100.0	100.0	

Table 3. Disagreement and agreement amongst the listeners in terms of accent (percentages and frequencies).

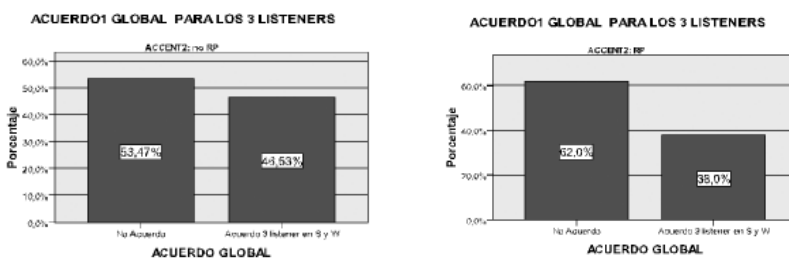


Figure 2. Disagreement and agreement amongst the listeners in terms of accent (%).

Kendall's tau rank correlation coefficient (W) indicates that for the category non-RP of the variable accent (W ($df = 2$) = 0.167 with $p < 0.05$), agreement amongst the referees is found to be statistically significant. Likewise, in the category RP (W ($df = 2$) = 0.151 with $p < 0.05$), the degree of concordance amongst the referees is found to be statistically significant. If we bear in mind that the results in the two categories of the variable accent are very similar amongst themselves, it can be claimed they are not statistically different and, consequently, this variable does not have an effect on the listeners' perception (see Table 4).

Estadísticos de contraste		
no RP	N	143
	W de Kendall ^a	,167
	Chi-cuadrado	47,684
	gl	2
	Sif.asintót.	,000
RP	N	649
	W de Kendall ^a	,151
	Chi-cuadrado	195,545
	gl	2
	Sif.asintót.	,000

^aCoefficiente de concordancia de Kendall

Table 4. Kendall's correlation coefficient in terms of agreement amongst the listeners taking accent into account.

7. CONCLUSIONS

The results obtained in this study suggest that gender and accent do not perform a significant role in the perception of English syllabic consonants and the schwa.

With respect to gender, the contingency table analysis reveals that being male or female does not make any difference in the listeners' perception, as suggested from the very similar degree of agreement amongst the referees regarding both genders. With respect to accent, a higher rate of concordance (8.5% higher) is found for non-RP. It may be precisely the close contact that the listeners maintain with RP which makes them find the phonemes in this accent harder to be recognised. A regular exposure to the RP accent is likely to lead to some kind of *overwhelming* feeling on the part of the referees towards the syllabic consonant vs. schwa identification. In addition, as the listeners themselves admit (see Appendix 3), they do not question the phonemes they pronounce or hear in their daily lives. In any case, the slight difference between the results obtained for RP and non-RP may be related to the fact that two of the referees were knowledgeable about phonetics. The Kendall correlation coefficient complements these findings by discarding statistically gender and accent as factors which have an effect on the listeners' perception of syllabic vs. non-syllabic consonants.

A wider approach would involve exploring the variable accent in terms of agreement amongst the listeners, having a larger group of referees naïve in phonetics, as well as dealing with the syllabic consonant vs. schwa perception considering other factors, such as word position (within an utterance) and word emphasis. All these tasks will be carried out by ourselves as this paper belongs to a project which has a broader scope.

8. ACKNOWLEDGEMENTS

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APPENDICES

Appendix 1

PRE-TASK QUESTIONNAIRE

- 1) What do you do in life?
- 2) What accent do you have?
- 3) Do you have a good ear for music? And for sounds? Tell me a bit about it.
- 4) Do you have any knowledge of English phonetics? If so, please tell me a bit about your experience in the area.

FURTHER INFORMATION ABOUT THE LISTENERS

AGES: They were young (29, 34 and 23 for L.F1, L.F2 and L.F3, respectively).

ACCENTS: L.F1 and L.F3 were born in Scotland (their origins were related to rhotic speech) but their accent was very soft, since they had lived in England for a long time. In particular, L.F1 used RP so often (she taught RP) that she spoke it as native. L.F2 was raised near Birmingham, but had lived in London for a long time. In general, she spoke RP and she did not have a regional accent, but she had some regional features, such as the use of the glottal stop or syllabic /m/. It is also worth noting that L.F2 had a jaw injury which meant she could not open her mouth, so weak vowels came easily to her.

GOOD EAR: They all played or had played musical instruments and were very good at singing. L.F3 has had extensive musical experience: she played the flute at school and often used to perform as a jazz and soul singer. L.F2 also played the flute and sang for pleasure. L.F1 also sang, and again not as a professional singer; she could be described as having an adaptable ear and willingness to try new things when speaking and singing. She liked picking up the characteristics of people's voices and repeating melodies when singing. Actually, her friends often said "Why don't you sing in your own voice?" Her gift for music was praised by one of her music teachers: "You have music in your head."

KNOWLEDGE OF PHONETICS: Whereas L.F1 and L.F2 had a considerable knowledge of phonetics, L.F3 had no knowledge at all. Actually, L.F1 was a teacher of voice, speech and accent, and most of her work involved teaching RP to non-native speakers of English. She passed the UCL IPA examination in summer 2008. L.F2 gave Introduction to Phonology training sessions to trainees on the foundation Trinity TEFL course for six years, and she obtained a distinction in the phonology interview of the Trinity Diploma, during which she had to identify consonants, diphthongs, vowels –both stressed and unstressed – connected speech, intonation, etc. These two listeners were very good at detecting different sounds. In contrast, L.F3 was not linked with phonetics/phonology work; she was a student of French, Spanish and international relations.

Appendix 2

TASK QUESTIONNAIRE

- 1) Which one do you hear in the last syllable of each word: a syllabic consonant or a schwa?

- a) Syllabic consonant
- b) Schwa

2) Do you recognise the speaker's accent? Which one is it?

Appendix 3

A PART OF THE POST-TASK QUESTIONNAIRE

QUESTIONS ADDRESSED TO L.F1:

GENERAL QUESTIONS ABOUT SYLLABIC CONSONANTS AND THE SCHWA

DIFFICULTY IN THE PERCEPTION OF THESE WORDS

1) Do you find it difficult to perceive the difference between the schwa and syllabic consonants in the documents I am sending you? Please provide some comments about it.

Yes, sometimes it is difficult to hear the difference. If it isn't obvious, which could be in up to a quarter of the cases, I listen to the word repeatedly and make up my mind from there. If I even hear the tiniest of schwa sounds, I write schwa, based purely on what I hear. Sometimes, though, depending on the sounds around it, it may be almost impossible for there to be no schwa due to the articulatory movement – if I hear a moment of phonation after one consonant has finished and before the next one is fully articulated I consider it to be schwa plus consonant. I did mention in one of the first speakers I did for you that I would have considered a syllabic consonant to be impossible in a particular word (I can't remember which one now), but now I just write what I hear and don't think too much about what's possible. It is hard, but I find it gets easier with practice. I actually quite enjoy it now and find the listening quite therapeutic!! If a consonant is truly syllabic it's usually quite obvious, to my ear, but I am the first to admit others may hear differently.

I'm as sure as I can be about my answers, bearing in mind that it's all depending on my subjective ear. I do understand other people may hear the same thing differently. One tool I use is that I think about when I teach the production of syllabic consonants to acting students (often desirable in a more conservative RP, in certain contexts) and I ask myself about the recordings – would I accept this pronunciation as a syllabic consonant or not if I heard it like this from an acting student? If not, then it's schwa, even if it's tiny. I also give my answer on the basis – if I had to say one or the other, which one is it most like?

QUESTIONS ADDRESSED TO L.F2:

GENERAL QUESTIONS ABOUT SYLLABIC CONSONANTS AND THE SCHWA

AWARENESS OF THE PRODUCTION OF SYLLABIC CONSONANTS AND THE SCHWA IN EVERYDAY SPEECH

1) a) Are you aware that you pronounce a schwa or a syllabic consonant in the words you utter in everyday speech?

No I don't think I was aware of it until I studied it. I was aware that it was easy to be lazy in English, pronouncing some sounds differently in continuous speech in order to speak more quickly, but I hadn't been aware of SC/schwa before.

- b) Do you think people realise what they pronounce?
No! Unless their attention is drawn to it.

QUESTIONS ADDRESSED TO L.F3:

GENERAL QUESTIONS ABOUT SYLLABIC CONSONANTS AND THE SCHWA

DIFFICULTY IN THE PERCEPTION OF THESE WORDS

- 1) Do you find it difficult to perceive the difference between the schwa and syllabic consonants in the documents I am sending you?
Yes.

AWARENESS OF THE PRODUCTION OF SYLLABIC CONSONANTS AND THE SCHWA IN EVERYDAY SPEECH

- 2) a) Are you aware that you pronounce a schwa or a syllabic consonant in the words you utter in everyday speech?
No.
- b) Do you think people realise what they pronounce?
No.

Appendix 4

VARIABLES (FACTORS)

--ORIGINAL (BEFORE GROUPING)

GENDER

- F: Female
-M: Male

ACCENT:

- RP (Received Pronunciation)
-NON-RP

- LN (Light/Soft Northern)
N (Northern)
LW (Light/Soft Welsh)
W (Welsh)
AF? (African features but RP based)

LISTENER

- L.F1 (Listener Female 1)
L.F2 (Listener Female 2)
L.F3 (Listener Female 3)

--GROUPED

ACCENT:

-RP

-NON-RP (LN, N, LW, W and AF?)