



The status of /r/ in the pronunciation of Turkish PhD candidates and its rehabilitation by computer and audacity programs

Mehmet Demirezen^{a *}

^a Hacettepe University, Faculty of Education, Ankara, 06800, Turkey

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Abstract

Today, there are two major standard varieties in English pronunciation in the world: British English (BrE, also called Received Pronunciation (RP) and North American English (NAE). British English is the hub of all the varieties of English dialects. One cannot consider NAE a separate language. Within British English and American English there are also a great variety of accents due the lingua franca effect of English. The Received Pronunciation (RP) and General American (GA) have received more attention than others from phoneticians and phonologists. In GA, which is a rhotic accent – /r/ phoneme, can occur in positions where many of the vowels can be r-colored by way of realization of a following /r/. American-r is a retroflex consonant and in the International Phonetic Alphabet, it is indicated with a hook in the bottom right, such as [ɹ]. The retroflex approximant [ɹ], which is an allophone of the alveolar approximant [ɹ], are heard in many dialects of American English, particularly in the Midwestern United States. One of the biggest differences between the British and the American accents is that Americans always pronounce the /r/ phoneme word-initially, word-medially and word-finally. In this paper, general situation of /r/ phoneme and special existence of retroflex-r of NAE will be explored in the pronunciation of 45 PhD candidates, who took an oral exam at Hacettepe University, Faculty of Education in the Department of English Language Education on July, 11th, 2012. In this research, the existence of /r/ phoneme will be investigated by using the Error Hunt Approach and a diagnostic test in listening comprehension, and a 50-minute lesson plan will be presented as a remedial rehabilitation refinement by Audio-articulation Model by computer and Audacity Program (1.2.6.)

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Keywords: Error hunt approach; retroflex-r; Audio-articulation Model; fossilization

1. Introduction

American and British English have two quite different articulation for /r/ phoneme. When speaking with the General American (GA), Americans use a rhotic r, which means they articulate it in all parts of the word, while the tongue tip is curved up towards roof of the fronto-palatal region of the mouth, including when it occurs after a vowel sound. GA means any educated American speech /r/ establishes a general category with /l/ phoneme, the two of which is called liquids. GA accent pronounces the r phoneme wherever it is written. So, there are perceptible differences between the two. The /r/ is very commonly existing phoneme in forms of liquid or approximant in many languages of the world. It was discovered that the North American English-r at word-initial, word-medial, and word-final occurrences has been a problematic pronunciation issue for 27 Turkish English teachers with BA degree in English Language Education, whose rate of misarticulation of retroflex NAE-r was 100% (Demirezen, 2011:896). There are several reasons of this ambiguous articulation of NAE-r by Turkish English teachers. The Turkish teachers can never approximate to the bunched-r and retroflex-r position of NAE r-phoneme because no comparable r-sound exists in the phonemic inventory of Turkish with these forms of articulations.

* Mehmet Demirezen. Tel.: +90-312-297-8575
E-mail address: md49@hacettepe.edu.tr

2. Phonemic structure of /r/ phoneme

As a term, GA describes a general catch-all category for any American speech variety. A great majority of GA speakers use rhotic-r, but they show wide variability in articulatory congruence of the rhotic-r phoneme. Since /ɹ/ is a tricky phoneme, the IPA-system recognizes at least eight kinds of /r/, each of which are articulatorily different from each other. In the structure of English, the /r/ phoneme very frequently takes place in form of different variants, like a consonant, semi-vowel, approximant, glide, or retroflex (Demirezen, 2011: 897). Since /r/ phoneme requires the simultaneous activation of the muscles in and around the apex during speech, it happens to be a difficult phoneme to articulate. In fact, /r/ is also difficult sound to be acquired in infantile speech for Americans (Shriberg, 1993; Sander, 1972) and Turkish infantile speech as well. It is notoriously difficult for American children to learn to produce (McGowan et al., 2003). Sander (1972) reported that the median age for acquisition of /r/ for American children was 3 years, and it was not until age 6 years that 90% of children produced /r/ correctly.

3. Two basic types of the /r/ phoneme in North American English

There are two types of /r/ which are articulated in NAE. In NAE or GA, The first type of /r/ phoneme is a voiced retroflex flap approximant (a semivowel, a liquid), and the second type is a voiced alveolar approximant (semivowel, a bunched liquid). The following figures indicate this difference as articulatory descriptions, which was also handled by Demirezen (2012, pp. 397-400).

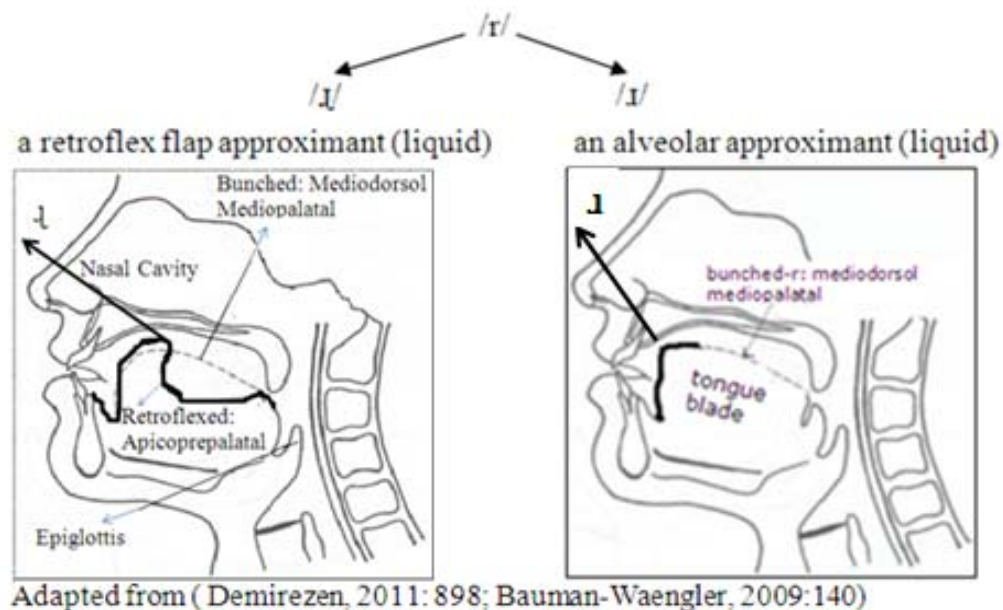


Figure 1. The /r/ phoneme in North American English

The airstream mechanism is pulmonic, which means that the /ɹ/ is made by pushing air solely with the lungs and diaphragm into the oral cavity via trachea. In the production of a retroflex approximant, there is a narrow passage, without being palatalized, between the apex and postalveolar (or apicoprepalatal) region of the vocal tract. While the airstream passes through, there is not enough opening to produce a turbulent airstream. The place of articulation is retroflex, which means that with the tip of the tongue curled up towards the roof of the mouth because of which the produced sound is called a central consonant, which means it is produced by directing the airstream along the center of the tongue and the roof of the mouth, rather than to the sides.

In the bunched form the tongue is laminal (flat). The place of articulation is alveolar which means it is articulated with either the tip or the blade of the tongue at the alveolar ridge, which are termed respectively apical and laminal. The apex touches the alveolar ridge without any curling up. Just like in its retroflex variant, the air passage is narrowed in the vocal tract at the place of articulation without the creation of a turbulent airstream, as seen in the second part of the above picture. Magnetic resonance images of vocal tract configurations during /ɹ/ production show that speakers of American English employ a wide range of articulatory strategies and shape their tongue differently to produce /ɹ/ (Espy-Wilson, 2004, pp. 62-63). Officially speaking, in most of the books and articles [ɹ] takes place.

4. British-r (Received Pronunciation, RP)

British-r has long used as a model for teaching English to foreign learners. RP is non-rhotic; that is, the phoneme /r/, is only articulated in RP when it is immediately followed by a vowel sound. It's status of pronunciation word-initially and word medially is not noticed very much, but its word-final articulation is noticed and audibly heard as a benchmark.

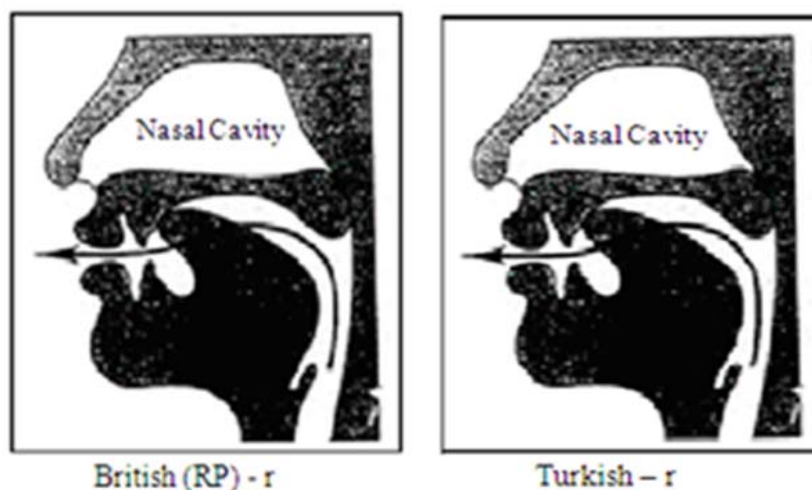


Figure 2. British English –r (Adapted from Kelly, 2000, p. 51)

There are very different names of the places of articulation given to retroflex flap-r. The voiced mediadorsal-mediopalatal rhotic approximant (bunched) or voice apico-prepalatal rhotic approximant (retroflexed) is indicated officially as [ɹ], not /ɹ/. Due to its difficult pronunciation, the retroflex-r as a flap is one of the most commonly misarticulated sounds, the curve of the apex up makes it more complex for Turks. Mother tongue intervention is a point on which all would agree that a learner's first language poses the biggest obstacle for learning the pronunciation of another language. The non-existence of retroflex-r in Turkish, the difficulty of curling up the tip of the tongue towards fronto-palatal region without creating any sign of palatalization is another difficulty. Apparently, this could explain why the retroflex-r approximant is one of the last sounds that could be mastered by Turkish PhD students.

The reasons for the poor development of English pronunciation skills by the Turkish lie not only in the Turkish language but also in the ways English is taught. Needless to say, pronunciation skill certainly falls within the parameters of communicative competence. If it is not acquired, it harms to develop a communicative competence in spoken English.

5. Methodology

This article explored the articulation of NAE /ɹ/ phoneme, which is a retroflex approximant in the articulation of 45 Turkish PhD degree participants. This research is based on the exploration of the following research questions:

1. In which environments do Turkish PhD degree candidates have a failure in the articulation of NAE retroflex /ɹ/ phoneme?
2. If they have, what must be the causes?
3. Do they need a rehabilitation of the retroflex /ɹ/ phoneme?

5.1. Participants

45 PhD candidates who come from 35 different state and private universities of Turkey took the oral exam. 10 of the participant were males and 35 of them were female. 30 of the applicants held an MA degree from the English Language Education Departments while 5 had an MA on English linguistics; 3 of them had an MA on English Translation Division; 7 of them held an MA degree on English Language and Literature while 5 of them held an MA on American Language and literature. The age range of the participants varied from 22 to 35. Of five candidates, 3 were males and two were females, had already finished an MA program in USA. Seven of them are recently graduated and are not teaching at the moment.

They altogether took the PhD oral exam in July 11, 2012 in the same day at Hacettepe University, Faculty of Education at the Department of English language Education. Each candidate was asked questions within 10 minutes by the jurors on English linguistics, foreign language education, language acquisition, bilingualism and multilingualism. Each of the participants is recorded within the boundaries of Error Hunt Approach by filling a diagnostic test. The participants had no idea that they were being scored by one of the jury members.

5.2. Materials

A diagnostic listening test was utilized in this research, which depended on the suggestions made by Baker (1993, p. 134) and is further modified by the author of this article. The diagnostic test and the suggested symbols for the capture of the fossilized vowel errors by (Baker 1993) are as follows:

- ^ = no difficulty with this sound
- XX = extreme difficulty with this sound
- X = difficulty
- X^ = minor difficulty

This model is modified by the researcher of this article by adding word-initial, word-medial, and word-final sections to the diagnostic test. The modified version of this diagnostic is shaped as follows:

- N=45 = Explored phoneme: /ɹ/ Initially Medially Finally
- ^ = no difficulty with this sound
- XX = extreme difficulty with this sound: /ɹ/ XX XX XX
- X = difficulty
- X^ = minor difficulty

For each candidate this diagnostic test was kept, and the shape it took was as follows:

- N=45 = Explored phoneme: /ɹ/ Initially Medially Finally
- ^ = no difficulty with this sound
- XX = extreme difficulty with this sound: /ɹ/ XX XX XX
- X = difficulty
- X^ = minor difficulty

When each record kept for the participants was put together, the totality of the data results boil down to:

- N=45 = Explored phoneme: /ɹ/ Initially Medially Finally
- ^ = no difficulty with this sound
- 40 = extreme difficulty with this sound: /ɹ/ XX XX XX
- X = difficulty
- X^ = minor difficulty

5.3. Data Collection and analysis

As it is already expressed, the Error Hunt Approach was utilized in this research in conjunction with a diagnostic test. The data was collected by the researcher by listening in to the answers given by the participants, who had no idea that they were being recorded; by this way the rate of exam anxiety they had was kept as it is. The researcher specified the existence of the North American retroflex /ɹ/ phoneme at the beginning, middle, and at end of the words in the articulations of the participants.

6. Results and discussion

In terms of data analysis in accordance with the recorded diagnostic test, the following findings are encountered:

6.1. RQ #1: In which environments do Turkish PhD degree candidates have a failure in the articulation of NAE retroflex /ɹ/ phoneme?

In spite of this fact, the analysis indicates that 40 participants (88.8%) have a serious mispronunciation of NAE retroflex /ɹ/ in word-initial, word-medial, and word-final environments.

By nature, NAE /ɹ/ is a retroflex flap phoneme, but 40 of the participants articulated it as an alveolar tap [ɾ], which is a Turkish form of /r/ form in speech: mother tongue interference is apparent. Only 5 of the 45 participants systematically and automatically articulated the /ɹ/ flap phoneme in the correct form most probably due to the fact that they held an MA degree from USA universities.

So, the first research question came out to be true. Such a rate like 88.8 % is a seriously high fault of pronunciation for PhD students because this rate demonstrates that they have a grave pronunciation defect, which probably will further be worsened by the addition of other fossilized pronunciation of vowels and consonants in a medium of fossilized multiarticulations. Then, the first research question was truly presupposed.

6.2. RQ #2: *If they have, what must be the causes?*

Familiarity with the problem-causing phoneme is the first cause to be explored. Since 30 of the applicants held an MA degree from the English Language Education Departments, they most probably took up two courses in Listening and Comprehension I and Listening and Comprehension II in the first year of their four-year education program. They may have studied on the production and perception of the retroflex flap /ɹ/, which requires a great mastery of tongue curving back up to the roof of the fronto-palatal region of the mouth, and other varieties of it. The other 15 applicants coming from the divisions of English and American literature, and Translation Division presumably had not studied on the perception and production of this phoneme. The matter of the fact is that the PhD students were still unable to internalize the perception and production of NAE retroflex /ɹ/ phoneme in three environments.

6.3. RQ #3: *Do the participants need a rehabilitation of the retroflex /ɹ/ phoneme in their pronunciation?*

Apparently, the third research question demonstrates that the participants must go through a remedial pronunciation correction treatment because foreign language teaching is a professional job, which requires at least the near native-like approximation of articulations in which they failed by a negative rate of 88.8 %. Such a high rate is unacceptable, and therefore they definitely need. For the rehabilitation process the Audio-articulation Model proposed by Demirezen (2010a) can be put into practice by a 50-minute lesson plan that comes to the stage in the forthcoming section.

7. Conclusion

As a result, pronunciation is still a great problem for learners of English regardless of their levels. Even PhD candidates have great predicaments in the articulation of some sounds like retroflex /ɹ/. Such a situation has been clear after an observation made during a PhD interview. So, it is a significant reality based on errors made by students.

Firstly, 88.8% of the PhD candidates have serious problems in the pronunciation of retroflex /ɹ/. This is a very great percentage, and its cause must be revealed. It seems that the reason of this unwanted situation is lack of background information and education in terms of articulation and speaking. It can also be stated that the reason of this reality dates back to the first years of the students' university lives.

However, cure is not far away. Rehabilitation can be provided by the help of Audio Articulation Model. Such a model provides exercises of many kinds to learners, by the help of which learners are expected to reach to better desired levels of pronunciation. Appendix A provides an example of Audio Articulation Model which is used by the writer of this article. In this model, the students hear and practice all of the exercises from the voice of the native-

speakers and near native speakers, whose speech and related practices in the texts are downloaded by the Audacity program and text to speech labs, like <http://text-to-speech.imtranslator.net/>, http://www.oddcast.com/home/demos/tts/tts_example.php, <http://www.acapela-group.com/text-to-speech-interactive-demo.html>, <http://www.ivona.com/en/>, and <http://www2.research.att.com/~ttsweb/tts/demo.php>.

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- <http://www.ivona.com/en/>
- <http://www2.research.att.com/~ttsweb/tts/demo.php>

Appendix A. An Application

Prepared PowerPoint presentation with the all exercises is given to the students in a memory stick.
A Remedial Lesson Plan for the rehabilitation of retroflex /ɹ/ phoneme of English:

1. Motivation- warm up

The teacher of pronunciation coach enters and greets the students.

Teacher: Hello students! How are you all today?

Students: Hello, sir! We are fine, how about you?

T: Thank you all, I am well. What did you do at the week end? The conversation goes on like this for a couple of minutes.

2. Review the previous subject:

T: Students, which English phoneme did we study in our previous lesson?

Stds: We worked on the articulation of /n/ phoneme in English.

T: Can you give me some words on it?

Stds: nine, nun, can, man, nanny, and the like.

T.: Very good, correct!

3. Present today's topic

T.:

Dear students, today we will study the **voiced retroflex approximant of NAE**, whose photic sign designed by IPA is /ɹ/. The words representing this phoneme are seen in the corpus.

4. Prepare a corpus:

CORPUS

barbarian /bɑːbəriən/	competitor /kəmˈpetədɔː/
barbarous /ˈbɑːbərəs/	extracurricular /ˌɛkstɪˈkʊləː/
border /ˈbɔːdə/	refrigerator /ˌrɪˈfrɪdʒəˌreɪdɔː/
carburetor /ˈkɑːbʊˌreɪdɔː/	referendum /ˌrɛfəˈrɛndəm/
career /kəˈrɪə/	rector /ˈrɛktɔː/
carrier /ˈkæriə/	reformer /ˌrɪˈfɔːmə/
corner /ˈkɔːnə/	registrar /ˌrɛdʒəˌstɹɪ/
farmer /ˈfɑːmə/	recovery /ˌrɪˈkʌvəri/
rancher /ˈræntʃə/	controller /kənˈtrɔːlə/
rather /ˈræðə/	razor /ˈreɪzə/
recorder /ˌrɪˈkɔːdə/	scarecrow /ˈskɛrkrou/
reciprocal /ˌrɪˈsɪpɪkəl/	warrior /ˈwɔːriə/
reconsider /ˌrɪkənˈsɪdɔː/	worker /ˈwɜːkə/

This corpus is studied by computer applications: all of these vocabulary items are downloaded by audacity (1.2.6) program and text to speech labs. This way approximation is created to native-like speech. Students repeat and recite them.

Tongue Twisters

As a principle of **Audio-articulation** pronunciation remediation model, problem-causing phoneme or sound occurs at least once in form-focus norms. There are double and triple occurrences of it for concentrated occurrences.

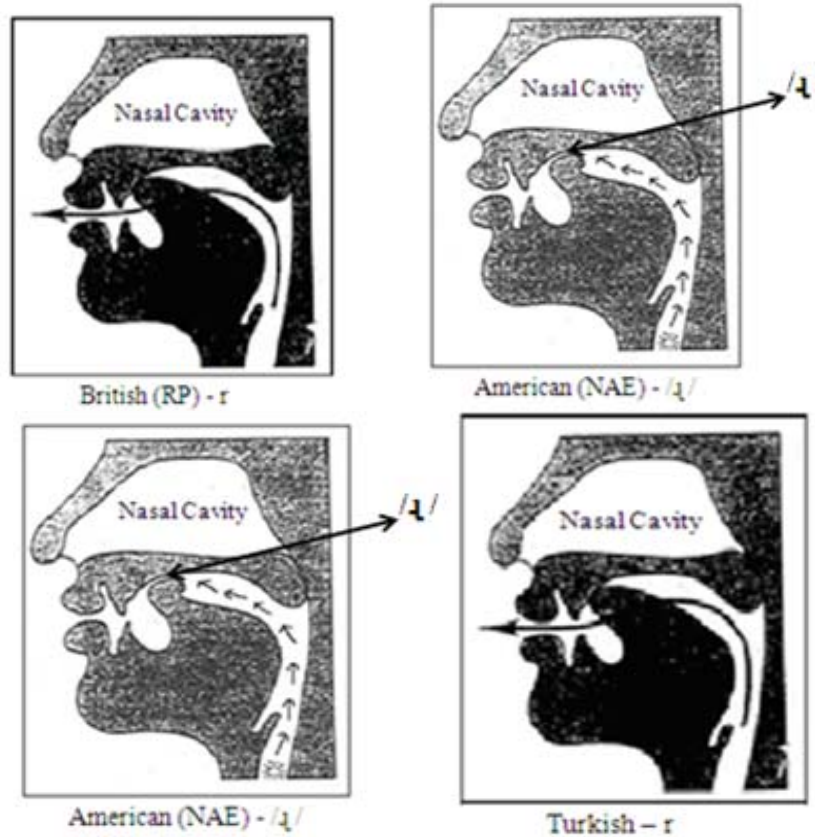
- | | |
|---|---|
| (1)
The order
The order of my partner
The order of my partner near the river
The order of my partner for the rumor near the river | (2)
Teardrops
Teardrops of a referee
Teardrops of a referee in a rainstorm
Teardrops of a referee in a storm at the corner |
| (3)
A teacher
A regular teacher
A regular teacher and a preacher
A former regular teacher and a preacher | (4)
A researcher
A researcher and reporter
A retired researcher and reporter
A retired researcher and reporter in recovery |
| (5)
The farmer
The former farmer
The former farmer at the corner
The former farmer at the corner of the border | (6)
An error
An error in a career
An error in a registrar's career
An error in a registrar's recorded career |
| (7)
A rector
A reformer rector
A reformer rector as a researcher
A reformer rector in a rumor as a researcher | (8)
A partner
A partner as a reporter
A partner as a former reporter
A partner as a former reporter in an error |
| (9)
A porter
A barbarous porter
A barbarous porter as a reformer
A barbarous porter as a regular reformer | (10)
The remark
The remark of a reviewer
The remark of a reviewer as a researcher
The remark of a reviewer as rare researcher |

5. Give the rule:

In the production of NAE retroflex approximant flap-r, middle and the back of the tongue (dorsum) is in a flat position while the apex (tip of the tongue) is curled up towards the front part of the hard palate in a touching position. Neither little friction or palatalization can be heard in the oral cavity nor is there a momentary closure of the vocal tract during the articulation process. The distinctive point here is that apex approaches the upper gum while it is curled up towards the roof of the mouth: this type of sound production is called as retroflexion. In the IPA, retroflex consonants are indicated with a hook in the bottom right as seen in this figure: /ɻ/. The following figures are adapted from Kelly (2008).

Definition: /ɻ/ is a voiced retroflex flap approximant (liquid) in NAE and is officially indicated by its alveolar form whose symbol is /ɻ/. Turkish phd students and Turks, in general, use the alveolar form of /ɻ/, due to its articulation difficulties caused by their mother tongue. Turkish learners of NAE do not perceive that a great mastery of tongue muscles is required in order to reach the correct target for /ɻ/. It is articulated by curling your tongue towards the back of the mouth fully. Then, it is actually the tip of the tongue doing the "job", not the dorsum of the tongue. The British alveolar

voiced tap approximant, on the other hand, is pronounced with the tip of the tongue approaching the alveolar or postalveolar region.



The points, places and manner of articulations in the above-mentioned pictures are explained in detail to the students. At this point, a short movie clip is presented to the students from the voice of a native speaker.

6. Continue with harder exercises:

Fill in the following words:

Paragraph 1 (In audio-form, downloaded from internet by Audacity (1.2.6) program and text to speech labs.

Warrior	barbarian	murderer	farmers	riders	after
terrorize	competitor	razor-sharp	teardrop	performing	barbaric

Instruction:

1. Listen to the production and articulation of the /ɹ/ phoneme in the following passage.
2. Memorize this passage and recite in front of a mirror.

Once upon a time, there was a **warrior** who was a real **barbarian**. He would do strange **barbaric** actions. In fact, he was a real **murderer**, who loved to kill rulers, **farmers**, workers, ranchers, and **riders**. In addition, he would love to **terrorize** his **competitors** with his **razor-sharp** sword. He was so ruthless that there would be no **teardrops** in his eyes **after** performing these killings.

Paragraph 2 (In audio-form, downloaded from internet by Audacity (1.2.6) program and text to speech labs)

Instruction:

1. Listen to the production and articulation of the / ɹ / phoneme in the following passage.
2. Memorize this passage and recite in in front of a mirror.
3. Try to track movement of your tongue (a bunched or retroflex form?) in a mirror. How far back do you curl the tongue to the hard palate?
4. Which type of-r are you systematically and automatically using?

Apart from being the scientific ruler, a rector is the establisher of careers at a university. He has to consider and reconsider the future of his faculty members who are pursuing scientific careers. As a scientific ruler, he is supposed to be the reviewer, recorder, reporter, performer, supporter, coordinator, moderator, and controller of all reforms in the curricular and extracurricular programs of his university. Also, he must be real supporter of teachers, instructors, lecturers, researchers.

7. Make a summary

First, the teacher takes the questions from the students. Then, s/he makes a summary and takes the students' attention to the pronunciation difficulties in NAE. The impact of mother tongue intervention is explained. A new video clip is shown to the students to summarize the retroflex nature of NAE. Finally, s/he gives the PowerPoint to the students so that they can study on their own in their free times.

8. Give homework to the students.

1. Each student will find out three words in which / ɹ / phoneme takes place three or four times.
2. Each student will write down 3 tongue twisters and downloaded them from internet by Audacity (1.2.6) program and text to speech labs).
3. Each student will write a paragraph (250 words) in each word of which / ɹ / phoneme will take place three times. It must be downloaded from internet by Audacity (1.2.6) program and text to speech labs.

Türk doktora adaylarında /r/'nin durumu ve Audacity bilgisayar programı ile iyileştirilmesi

Öz

Günümüzde İngilizce telaffuzunda dünyada iki temel standart çeşit vardır: İngiliz İngilizcesi ve Kuzey Amerika İngilizcesi. İngiliz İngilizcesi, İngiliz lehçelerinin bütün türlerinin merkezindedir. Kimse Amerikan İngilizcesini ayrı bir dil olarak düşünemez. İngilizcenin ortak iletişim dili olma etkisinden dolayı, İngiliz ve Amerikan İngilizcesinin içinde pek çok aksan çeşidi vardır. İngiliz İngilizcesi (RP) ve Amerikan İngilizcesi (GA) sesbilimciler ve sesbilim uzmanları tarafından daha fazla dikkat çekmiştir. r- birimsesli aksan olan GA'da, pek çok ünlü onları takip eden /r/ sesinin fark edilmesiyle r- etkin olabilen pozisyonlarda olabilir. Amerikan-r geriye dönük tür ve Uluslararası Fonetik Alfabesinde şekilde görüldüğü gibi tam altında bir çengelle belirtilir: [ɹ]. Dişyuvasal approximant /ɹ/ nin sesbirimsel değişkeni olan geriye dönük approximant /ɹ/, Amerikan İngilizcesinin birçok lehçesinde özellikle Orta Batı Amerika'da duyulur. İngiliz ve Amerikan aksanları arasındaki en büyük farklılıklardan biri Amerikalıların /r/ birimsesini kelime başında, kelime ortasında ve kelime sonunda her zaman telaffuz etmeleridir. Bu çalışmada, /r/ birimsesinin genel durumu ve Kuzey Amerikan İngilizcesindeki geriye dönük-r nin özel varlığı, Hacettepe Üniversitesi Eğitim Fakültesi İngiliz Dili Eğitimi Anabilim Dalı'nda yapılan sözlü sınava katılan doktora adaylarının telaffuzlarında keşfedilecektir. Bu araştırmada, Hata Yakalama Yaklaşımı ve Dinleme-Algılama sınavı kullanılarak /r/ birimsesinin varlığı araştırılacak ve 50 dakikalık bir ders planı bilgisayar ve Audacity Programı yardımıyla Duy-Seslet Modeli kullanılarak onarımsal iyileştirme sunulacaktır

Anahtar sözcükler: Hata yakalama yaklaşımı; geriye dönük-r; duy-seslet modeli; kemikleşmiş hata

AUTHOR BIODATA

Mehmet Demirezen graduated from the Department of English Linguistics in 1973, Hacettepe University. He completed his first MA studies in English Language and Literature between the years 1973-1974. He graduated from the University of Texas at Austin in the USA with a second MA degree in Linguistics in the years 1974-1975. He earned his PhD degree in 1977 in linguistics and his associate-professorship degree in 1983 in linguistics in Hacettepe University Department of Linguistics. He completed his full professorship studies in 1988 at the same university in the field of English Language Education. His research interests include applied phonetics and phonology, teaching advanced writing, language acquisition, educational linguistics, testing techniques, developing foreign language policies, bilingualism and multilingualism. He is presently the chairman of the department of the English Language Education, Faculty of Education, Hacettepe University, Ankara, TURKEY.