

# Stress Placement in Suffixed Words by Brazilian Students of English

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## 1. Introduction

This article concentrates on the analysis of the inadequate stress collocation on suffixed English words by Brazilian students of English. The main aim of this work has been to do an exploratory study to identify the possible stress transference from Portuguese to English. This research has used English words on which stress is on the fourth syllable from the end. As this is a rare pattern in Portuguese, it can be seen if the students have acquired English stress pattern after years studying or if they remain with Portuguese pattern and transfer it into English.

This study comes from the hypothesis that students have more stress difficulties when it does not exist or rarely exists on their mother tongue. It can happen due to interference from the first language, lack of correction during classes and little exposition to this kind of words. De Bot (1996) states that knowing a problem is not solving it, but this knowledge can increase the attention on relevant information on the input, helping the solution of the problem. Therefore, when students are constantly exposed to a wrong input, the output will not be correct.

Also, when a basic student is exposed to unknown words, his/her tendency is to look for a pattern within his/her first language. Pater (1997:235) states that “it is uncontroversial that learners of a second language, at least in the earliest stages, make use of first language rules, parameter settings, or constraints for word level stress placement.”

This tendency has also been demonstrated by Archibald (1993, 1994), who conducted experiments with Polish, Hungarian and Spanish native speakers learning English in Canada. The participants performed tasks related to stress assignment perception and production. According to Archibald, the parameter transference from first to second language was evident in both tasks. It shows that the interlanguage grammar of the speakers is ruled by the same kind of metrical representation and learning theory from the L1 grammar. Ellis (1985) also argues that L1 is extremely relevant to interlanguage: “The L1 is a resource of knowledge which learners will use both consciously and subconsciously to help them sift the L2 data in the input and to perform as best as they can in the L2.” (Ellis, 1985:40).

## 2. The experiment

Twenty students read 50 sentences (see the Appendix) with words stressed on the fourth syllable from the end and 50 sentences with stress on one of the last three syllables.<sup>1</sup> The objective of this methodology was to check if it is really more difficult for students when the stress pattern is rare in Portuguese. To check if the information was correct and if the position of the word on the sentence did not influence the stress assignment, the students also recorded all words separately.

### 2.1 The participants

All the participants of this research work for the same company and take an annual test to measure their knowledge of English. All of them had at least 50% of correct answers in their

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<sup>1</sup> Brazilian Portuguese words can only be stressed on the three last syllables.

2004 test. It was decided to choose more advanced students because they are supposed to have a good experience with the language and some knowledge of the stress pattern in English. Also, using advanced students it would be possible to check if they have acquired the particularities of English pronunciation after years of study. Another requirement in the choice of the participants was that they had not lived in an English speaking country in order to avoid influence on the student pronunciation by a previous contact with native speakers.

## 2.2 The words

Some criteria were used in the selection of the words so that they would be as similar as possible. The following criteria were used in the words with stress on the fourth syllable from the end:

- All of them should come from Latin in order to be familiar to the students.
- All words had suffixes, such as *-ize*, *-ly*, *-able*, *-ate*, *-ator*, *-ive*, *-er*, *-ably*, *-ure*, *-y*, *-ary*.
- There were no differences on the American and British pronunciation that could change the stress position.

### LIST OF WORDS

<i>materialize</i>	<i>naturally</i>	<i>marginally</i>	<i>noticeable</i>
<i>investigator</i>	<i>manipulative</i>	<i>communicative</i>	<i>investigative</i>
<i>generative</i>	<i>organizer</i>	<i>characterize</i>	<i>categorize</i>
<i>considerable</i>	<i>particularly</i>	<i>fascinating</i>	<i>calculator</i>
<i>sophisticated</i>	<i>speculative</i>	<i>commentator</i>	<i>definitely</i>
<i>inevitably</i>	<i>memorable</i>	<i>legislative</i>	<i>legislature</i>
<i>architecture</i>	<i>qualitative</i>	<i>personally</i>	<i>personalize</i>
<i>radiator</i>	<i>refrigerator</i>	<i>relatively</i>	<i>difficulty</i>
<i>supervisor</i>	<i>industrialize</i>	<i>fortunately</i>	<i>virtually</i>
<i>commemorative</i>	<i>comparatively</i>	<i>cooperative</i>	<i>navigator</i>
<i>administrative</i>	<i>administrator</i>	<i>reasonable</i>	<i>customary</i>
<i>consequently</i>	<i>indicator</i>	<i>elevator</i>	<i>illustrator</i>
<i>subsequently</i>	<i>operator</i>		

The requirements for the selection of the words with stress on the second or third syllable from the end were:

- All words should come from Latin and have suffixes, such as *-al*, *-tion*, *-ive*, *-ity*, *-ly*, *-able*, *-ate*, *-ar*, *-ary*, *-ous*, *-ant*.
- The words should contain at least four syllables to guarantee the possibility of stress assignment on the fourth syllable from the end.
- The words had a different stress pattern from their cognate in Portuguese to avoid the copy from Portuguese stress.

## LIST OF WORDS

<i>prejudicial</i>	<i>horizontal</i>	<i>additional</i>	<i>emotional</i>
<i>fundamental</i>	<i>experimental</i>	<i>exceptional</i>	<i>industrial</i>
<i>ceremonial</i>	<i>editorial</i>	<i>confidential</i>	<i>phenomenal</i>
<i>association</i>	<i>graduation</i>	<i>education</i>	<i>concentration</i>
<i>identification</i>	<i>speculation</i>	<i>reconciliation</i>	<i>celebration</i>
<i>interruption</i>	<i>competitive</i>	<i>complexity</i>	<i>nationality</i>
<i>eternity</i>	<i>electricity</i>	<i>personality</i>	<i>officially</i>
<i>maternity</i>	<i>maturity</i>	<i>masculinity</i>	<i>celebrity</i>
<i>intensity</i>	<i>sensitivity</i>	<i>respectable</i>	<i>adaptable</i>
<i>immediate</i>	<i>eternally</i>	<i>familiar</i>	<i>elementary</i>
<i>documentary</i>	<i>mysterious</i>	<i>alternative</i>	<i>ability</i>
<i>significant</i>	<i>individualist</i>	<i>politician</i>	<i>vegetarian</i>
<i>historian</i>	<i>religious</i>		

Suffixed words were chosen because they have specific rules for stress assignment which could be assimilated by the students through practice and frequent use. Also, as Baptista (1984) demonstrated, suffix rules are more easily applied by native speakers than phonological generative rules. It could also happen with non-native speakers.

## 3. Results

If the number of correct answers performed by the students in the stress assignment of words with stress on the fourth syllable from the end is compared to the number of correct answers in words with stress on the second or third syllable from the end, the hypothesis that many more mistakes would be made in words with the stress on the fourth syllable is confirmed, as shown in Tables 1 and 2.

**Table 1.** The word in the sentence context

	Answer	
	Correct	Incorrect
Stress on the fourth syllable from the end	272	728
Stress on the second/third syllable from the end	883	117

**Table 2:** The isolated word

	Answer	
	Correct	Incorrect
Stress on the fourth syllable from the end	240	760
Stress on the second/third syllable from the end	885	115

In the data analysis of this study, as exemplified in Table 3, it could be seen that a big part of the stress assignment mistakes refers to words which have the last vowel tense. This fact was also found on Baptista's research (1989) and it was stated by many other researchers:

Matos and Cintra (1966:115) attribute the frequent erroneous final stress given to verbs such as 'economize' and 'separate' to a transfer of the Portuguese primary stress of their cognates,

whereas Kingdon (1958:100) notes that this is a frequent error of English students regardless of their native language (apud Baptista, 1989:10).

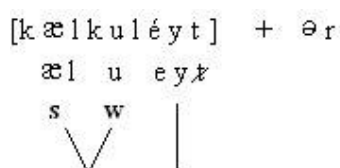
A possible explanation to the inadequate pronunciation in words with stress on the fourth syllable from the end which finish in diphthong + consonant or diphthong + consonant + neutral suffix is the application of the Marked Rhyme Hypothesis, as suggested by Mairs (1989) for Spanish speakers.

In a study to analyze the stress pattern found in the interlanguage of English students whose first language is Spanish, Mairs (1989) noticed that almost all incorrectly stressed words were stressed by the participants in a rhyme of the kind vowel + glide + consonant# (-VGC#) or -VGC# + neutral suffix.

**Table 3.** Performance of the students reading the sentences with words which are stressed on the fourth syllable from the end

WORDS IN THE SENTENCE	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12	S 13	S 14	S 15	S 16	S 17	S 18	S 19	S 20	TOTAL OF CORRECT SENTENCES	TOTAL OF WRONG SENTENCES
(1) ma'terialize							1										1				2	18
(2) naturally			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	2
(3) 'marginally	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1			1	1	16	4
(4) 'noticeable						1		1		1	1	1			1					1	7	13
(5) ma'nipulative														1						1	2	18
(6) com'municative		1				1	1					1	1	1							6	14
(7) in'vestigative			1						1		1						1			1	5	15
(8) in'vestigator						1						1	1	1					1	1	1	19
(9) 'generative		1			1				1			1	1	1					1	1	8	12
(10) 'organizers																					0	20
(11) 'characterize								1							1						2	18
(12) categorize						1	1	1												1	5	15
(13) con'siderable		1				1				1			1	1	1	1	1				8	12
(14) par'ticularly	1		1	1	1		1	1			1	1	1	1	1	1	1	1			14	6
(15) 'fascinating																	1				1	19
(16) 'calculator																					0	20
(17) so'phisticated			1			1						1	1	1	1	1	1		1		9	11
(18) 'speculative									1												1	19
(19) 'commentator																					0	20
(20) 'definitely					1	1	1	1						1	1	1	1				8	12
(21) i'nevitably		1			1	1	1	1	1		1	1	1	1	1	1	1	1		1	15	5
(22) 'memorable	1						1	1			1	1	1	1	1	1	1			1	10	10
(23) 'legislative																					0	20
(24) 'legislature							1													1	2	18
(25) 'architecture																		1		1	2	18
(26) 'qualitative			1				1				1		1			1					5	15
(27) 'personally	1				1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	15	5
(28) 'personalize				1			1					1				1		1			5	15
(29) radiator																1					1	19
(30) re'frigerator																					0	20
(31) 'relatively																1					1	19
(32) 'difficulty				1				1		1				1	1		1	1	1		8	12
(33) 'subsequently																					0	20
(34) 'supervisor																					0	20
(35) in'dustrialize									1												2	18
(36) 'fortunately		1	1	1	1	1					1	1	1	1	1	1	1	1	1	1	15	5
(37) 'virtually	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	19	1
(38) 'operator																					0	20
(39) com'memorative									1	1	1	1	1	1	1	1		1			8	12
(40) com'paratively							1						1		1				1		4	16
(41) co'operative		1								1											2	18
(42) 'navigator												1									1	19
(43) ad'ministrative				1								1		1	1		1				5	15
(44) ad'ministrator																					0	20
(45) 'reasonable	1		1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	3
(46) 'customary			1		1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	15	5
(47) 'consequently							1		1				1	1	1		1				6	14
(48) 'indicators																					0	20
(49) 'illustrator																					0	20
(50) 'elevator							1														1	19
TOTAL	6	8	10	7	11	15	18	15	9	13	12	19	16	20	24	12	22	11	8	16	272	728

Mairs's explanation for the mistakes and the correct stress assignments was that the rules for English stress were not applied by the participants in rhymes of the kind -VGC. In the English stress assignment, in a word like *calculator* the suffix is not considered in the first cycle and the rules of nouns extrametricality are applied, marking the final rhyme as extrametrical. The Strong Retraction rule is then applied, assigning left-headed binary feet from right to left. In the second cycle, with the suffix addition, the stress does not change because -or is a neutral suffix. The result is shown in Figure 1:



**Figure 1.** Stress assignment in *calculator* (Mairs, 1989:274).

However, the rhyme -VGC is marked in Spanish and the student divides it in -VG and -C. The peripheral condition, which states that the extrametricality can only be applied in elements inside the word boundaries, impedes this rhyme from becoming extrametrical. There is also the Marked Rhyme Hypothesis: the rhyme extrametricality rules are not applied on marked rhymes for students who speak a second language. As a consequence of the marked rhyme and the peripheral condition, -VGC rhymes are not considered as extrametrical for students whose first language is Spanish and are stressed by the rule which assigns a non-branched foot to final rhymes with long vowels. Thus, the mistakes made by the participants of Mairs's research are explained and the correct stress assignments are due to the correct application of English rules in words which are not formed by a marked final rhyme.

As the majority of the mistakes in this study also happened in words with the last tense vowel, this theory can easily be transferred to English students whose first language is Portuguese, explaining then the correct and incorrect stress assignment performed by Brazilian students.

To a better understanding of the application of the Marked Rhyme Hypothesis by Brazilian students, it is first necessary to understand how the stress rules that generate these words stressed on the fourth syllable from the end work. According to the rules created by Hayes (1981), this stress assignment is due to the extrametricality principles and the Strong Retraction Rule (apud Mairs, 1989). There are two possibilities for the extrametricality application in these words:

- a) Noun Extrametricality Rule – mark the noun final rhymes as extrametrical.
- b) Trisyllabic Extrametricality Rule – mark the final rhyme of any word with three or more syllables as extrametrical.

With the final rhyme as extrametrical (e.g., *investigate*, *organize*, *fascinate*), the Strong Retraction rule is applied, forming left-headed binary feet from right to left for the remaining syllables, stressing the word on the fourth syllable from the end.

*in* [ˈves ti] **gate**

[ˈor ga] **nize**

[ˈfas ci] **nate**

As Mairs explained, the diphthong + consonant rhyme is rare in Spanish and is, thus, considered a marked pattern by Spanish speakers. Regarding Portuguese, words finishing in diphthong + consonant is also rare and may be considered marked. Applying the Marked

Rhyme Hypothesis, these rhymes are not considered extrametrical by Brazilian students and, according to Mairs, are stressed by the rule of stress assignment on long final vowels. This would explain a big number of the stress mistakes found in this research, such as: *investi'gator*, *orga'nizer*, *fasci'nating*. Even with the addition of the suffixes in the second cycle, the stress does not change with neutral suffixes. In words like *materialize* and *personalize* this rule could be applied in the full word, already with the addition of the suffix.

However, not all mistakes happen in words with final rhyme diphthong + consonant. There are other kinds of heavy rhymes which are marked for Brazilian Portuguese, such as -ive. It is possible to consider a second possibility for the interpretation of the stress assignment in these marked rhymes. Instead of being stressed according to the rule of final long vowels stress, they could be stressed by a transfer from rules of Portuguese. According to the rule of primary stress proposed by Bisol (1994), which stated the collocation of an asterisk in the heavy final syllable, it is also possible to consider the stress of marked final rhymes as a transfer from the rule of Portuguese. Therefore, the stress assignment of the words would be explained by the marked rhyme hypothesis and the application of an asterisk to the heavy final syllable.

Considering the transfer of the rule from Portuguese instead of the rule of stress assignment in long final vowels, it is possible to explain not only the mistakes in the stress of final rhymes diphthong + consonant, but also all marked heavy final rhymes, such as those finished in -ive, which also have a big number of mistakes in this research.

The other words with stress in the fourth syllable from the end seem to receive stress by the Strong Retraction rule or the second rule of Bisol (form a binary left-headed constituent (\* .)), which are similar. However, there is a variation in the application of the extrametricality rule, which sometimes is applied and sometimes not.

*memo'rale*<sup>2</sup>: *memo*[*ra ble*]  
*me'morable*: *me* [*mo ra*] (**ble**)<sup>3</sup>  
*archi'tecture*: *archi* [*tec ture*]  
*ar'chitecture*: *ar* [*chi tec*] (**ture**)  
*legis'lature*: *legis* [*la ture*]  
*le'gislation*: *le* [*gis la*] (**ture**)

The variation in the stress assigned by the participants can be explained with the variation in the application of the extrametricality rule. It can also be considered a second variation hypothesis, which is the application of the rule in the first or second cycle. Thus, the mistakes in *subsequently* and *consequently*, for example, could be explained by the lack of use of the extrametricality rule or by the application of the rule in the second cycle, with the previous addition of the neutral suffix.

*subse'quently*: *subse* [*quent ly*]  
*conse'quently*: *conse* [*quent ly*]

These two variation possibilities are hypotheses that may be present in the interlanguage of the students and be unconsciously applied by them. Nevertheless, it is not possible to know which one of them is really applied and if there is a consistency in this application or a variation in their choices. The results obtained are consistent, so there is a pattern being followed, but it is not possible to know if it is the use or not of the extrametricality or the application of rules in the first or second cycle.

<sup>2</sup> syllable stressed by the participants

<sup>3</sup> extrametrical element

Also, the correct stress assignments can be understood as the correct application of the rules because they happen in words with possible rhymes in Portuguese or because of the frequent use, providing automatic stress assignments, such as in the suffix *-tion*.

#### 4. Conclusion

The hypothesis that words stressed on the fourth syllable from the end would have a significant bigger number of mistakes in the stress assignment was proved. Out of a thousand possible answers for each type of stress, 728 were incorrect in such words, while in words stressed on the second or third syllable from the end only 117 were incorrect. The result was similar in words pronounced in isolation: 760 mistakes in the pronunciation of words stressed on the fourth syllable from the end and 115 in the others.

It was considered that students in advanced levels use the stress rules of Portuguese when they are dealing with words with marked rhyme in their language. According to the Marked Rhyme Hypothesis (Mairs, 1989), a student does not use the extrametricality rule when the rhyme is not common in his/her native language. As the final rhymes in this English words are not considered extrametrical by the participants, it seems they were stressed by the rule of Portuguese on which heavy final syllables receive an asterisk (e.g., categorize, generative) (Bisol, 1994).

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#### Appendix: Sentences used in the data collection

1. Her hopes of becoming a painter will never *ma'terialize*.
2. *Naturally* we want to see few job losses.
3. Food is *'marginally* more expensive.
4. There was a *'hoticeable* improvement in his cooking.
5. She was a *ma'hipulative* child.
6. He wasn't very *com'municative*.
7. Children should take an *in'vestigative* approach to learning.
8. He works as an *in'vestigator*.
9. The mind has great *'generative* capacity.

10. I must talk to the *'organizers*.
11. Bright colours *'characterize* his paintings.
12. I would *'categorize* this as a work of art.
13. The fire caused *con'siderable* damage to the house.
14. We're *par'ticularly* interested in learning Math.
15. I found the film *'fascinating*.
16. I have a pocket *'calculator*.
17. She was slim and *so'phisticated*.
18. The article was considered very *'speculative*.
19. He works as a radio *'commentator*.
20. He *'definitely* said he'd be here.
21. Their arguments *i'hevitably* end in tears.
22. She had a *'memorable* performance.
23. The Congress has a great *'legislative* power.
24. He's a member of the *'legislature*.
25. The town has modern *'architecture*.
26. There's a *'qualitative* difference between these computers.
27. Parents should be made *'personally* responsible for children.
28. She wants to *'personalize* her room.
29. There was a problem with the *'radiator* in my car.
30. I've bought a new *re'frigerator*.
31. There was *'relatively* little food.
32. We finished the job with great *'difficulty*.
33. He was arrested and *'subsequently* freed.
34. He's a good *'supervisor*.
35. It was the first country to *in'dustrialize*.
36. *'Fortunately*, we got home before it started to rain.
37. My book's *'virtually* finished.
38. I'm a radio *'operator*.
39. The square has a *com'memorative* statue.
40. This machine is *com'paratively* cheap.
41. They're not very *co'operative*.
42. He's a great *'navigator*.
43. His duties are mainly *ad'ministrative*.
44. She works as a school *ad'ministrator*.
45. We had a *'reasonable* journey.
46. It is *'customary* to give presents at Christmas.
47. I spent all my money and *'consequently* had nothing to eat.
48. Price changes can be *'indicators* of inflation.
49. He's a wonderful *'illustrator*.
50. There's only one *'elevator* in my building.
51. Smoking is *preju'dicial* to our health.
52. You should draw a *hori'zontal* line.
53. We have to pay the *ad'ditional* costs.
54. He's a very *e'motional* man.
55. Understanding grammar is *funda'mental* to learning a language.
56. The drug is at the *experi'mental* stage.



57. She's an *ex'ceptional* student.
58. It's an *in'dustrial* city.
59. She works with the *cere'monial* duties.
60. *Edi'torial* decisions are made by seniors.
61. All information will be treated as *confi'dential*.
62. Her rise to fame was *phe'homenal*.
63. The Football *Associ'ation* is discussing the next game.
64. My *gradu'ation* party is next week.
65. It's important for children to get a good *edu'cation*.
66. There was a look of *concen'tration* on her face.
67. We were asked to show some *identifi'cation*.
68. *Specu'lation* about his future plans is common.
69. It took us hours to bring about a *reconcili'ation* between them.
70. Good news deserves a *cele'bration*.
71. I worked all morning without *inter'ruption*.
72. Acting is very *com'petitive*.
73. It's a problem of great *com'plexity*.
74. She has British *natio'hality*.
75. Nine months may seem an *e'ternity*.
76. The *elec'tricity* has been turned off.
77. She has a very warm *perso'hality*.
78. The royal wedding was announced *of'ficially* today.
79. That store sells *ma'ternity* clothes.
80. The chicks soon reach *ma'turity*.
81. His *mascu'linity* is not in question.
82. He's going to become a big *ce'lebrity*.
83. The poem showed great *in'tensity*.
84. She shows a lot of *sensi'tivity* when talking to people.
85. She earns a *res'pectable* salary.
86. She's very *a'daptable* to changes.
87. That poison takes *im'mediate* effect.
88. Seasons are *e'ternally* changing.
89. The street was *fa'miliar* to me.
90. They made some *ele'mentary* mistakes.
91. They showed a *docu'mentary* on animals.
92. Her life is very *mys'terious*.
93. It's an *al'ternative* to coffee.
94. There has been a *sig'nificant* increase in the number of students.
95. She prefers to do things her way - she's a real *indi'vidualist*.
96. He would like to become a *poli'tician*.
97. Green Life is a *vege'tarian* restaurant.
98. He is an important *his'torian*.
99. Many *re'ligious* leaders attended the event.
100. She has the *a'bility* to explain things clearly.