The Influence of Preceding Context and Cluster Length on the Production of English Words Ending in *-ed* by Brazilians

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1. Introduction

In an overview of pronunciation difficulties of Brazilian English as a Foreign Language (EFL) learners, Baptista (2001, 2002) identifies the production of initial /s/-clusters; simple past tense *-ed*; single initial and final consonants and the distinction between vowels /ɪ/-/i/, /æ/-/ɛ/, and /ʊ/-/u/, as the most frequent ones. Studies have found that vowel paragoge is frequently produced in single final consonants (Baptista & Silva Filho, 1997, 2006; Delatorre, 2004; Koerich, 2002, 2006; Silveira, 2004); vowel prothesis is produced in initial /s/-clusters (Cornelian Jr., 2003; Delatorre, 2004; Rauber, 2002, 2006; Rebello, 1997, Rebello & Baptista, 2006; Silveira, 2002), and vowel epenthesis is produced in the simple past tense *-ed* (Alves, 2004; Delatorre, 2004, 2005, 2006; Pereira, 1994).

Some of these studies and other previous research have demonstrated that the interaction between markedness and phonological context in terms of consonantal and vocalic contexts can influence the production of both vowel paragoge in single final consonants (e.g., Baptista & Silva Filho, 1997, 2006; Koerich, 2002, 2006; Silveira, 2004) and vowel prothesis in initial /s/-clusters (e.g., Carlisle, 1991, 1992, 1994, 2006; Carlisle & Baptista, 2007; Cornelian Jr., 2003; Delatorre, 2004; Rauber, 2002, 2006; Rebello, 1997; Rebello & Baptista, 2006, Silveira, 2002). Besides that, vowel prothesis in with initial /s/-clusters has shown to be influenced by cluster length as well.

Motivated by these studies and by the lack of studies regarding the production of words ending in *-ed*, that is, regular verbs in the simple past and in the past participle, the present study investigated the influence of the preceding consonantal and vocalic contexts and of voicing of these consonants as well as the influence of the length of the cluster formed by the addition of the *-ed* morpheme to the previous context In other words, the study aimed at indicating which types of codas and phonological contexts trigger more mispronunciations of *-ed* words.

The background for the study was set mainly on followed Eckman's (1987a) Markedness Differential Hypothesis (MDH), Selkirk's (1984) Sonority Sequencing Generalization (SSG) and Hooper's (1976) Consonantal Strength Hierarchy.

2. The influence of the preceding phonological context

The interaction between markedness and phonological context has been considered not only in terms of markedness degrees of the target itself, but also taking into account markedness of the contextual segment. Studies of vowel prothesis in the production of initial /s/-clusters have taken this path However, in regard to such an influence on the production of codas, as mentioned by Bettoni-Techio (2005), the literature does not offer sufficient data for establishing its importance.

Concerning initial /s/-clusters, studies have found inconsistent results regarding the influence of the preceding consonantal and vocalic contexts.

Investigating Spanish speakers, Carlisle (1991, 1992, 2006) and Rauber (2002, 2006) found that they tended to produce more prothesis in initial /s/-clusters preceded by consonants than by vowels. The results of five studies with Brazilians showed an opposite tendency. Although the results of he first two studies were not statistically significant, Rebello (1997), Rebello and Baptista (2006), Rauber (2002, 2006), Cornelian Jr. (2003) found that vowels induced more prothesis than consonants. However, Carlisle and Baptista (2007) found the same order of the studies with Spanish speakers.

Accounting for the lack of data on the influence of consonants and vowels as preceding contexts in the production of vowel epenthesis in coda position by Brazilian EFL learners, Delatorre (2004, 2005, 2006) considered both the influence of the preceding context in terms of consonants and vowels, and of voicing of the consonant in the production of vowel epenthesis in words ending in *-ed*.

These studies yielded conflicting results regarding the influence of consonants and vowels. In the first study, involving six advanced participants, the author found that the less marked context (vowels) caused more epenthesis than the more marked context (consonants), and the difference was statistically significant ($p < .05$). Nevertheless, the results of Delatorre (2005, 2006), involving nine intermediate learners, showed an opposite direction. The unexpected results of the first study in terms of markedness relations were reasoned to be explained by individual factors since one of the participants produced epenthesis exclusively after vowels, more specifically, only in the case of the word *studied*, another participant produced high rates of epenthesis in both contexts and the other four did not produce epenthesis at all.

In the case of the second contrast – voicing of the target consonant and voicing of the consonant preceding the cluster formed in the production of the *-ed* morpheme – studies involving Brazilian EFL speakers have found different and sometimes conflicting results as well, partially confirming the predictions based on markedness that the more marked voiced consonants would cause more epenthesis less marked voiceless ones (Greenberg, 1978; Eckman and Iverson, 1994).

Regarding the influence of voicing of the contextual consonant on the target consonant, Baptista and Silva Filho (1997, 2006) studied vowel paragoge in pairs of stops, of the fricatives (/f, v/, /s, z/) and affricates and, although the overall rates were low, found a tendency for voiced consonants to more frequently yield vowel paragoge than their voiceless counterparts. Koerich (2002, 2006) also studied the production of vowel paragoge in stops, the fricatives (/f, v/), and affricates, and found the same tendency; however, the differences were extremely small. The author argued that her results indicated that, for students at a low level of proficiency in the foreign language, L1 interference seems to be stronger than markedness in terms of voicing of the target consonant.

Silveira (2004) studied the effect of instruction on the production of final consonants comparing the pairs of stops /p, b/ and /t, d/ and fricatives /f, v/ and found that voiced consonants triggered more vowel paragoge than voiceless ones.

Bettoni-Techio (2005) found that, although vowel paragoge was only the third most frequent strategy used by the participants to deal with final /t/ and /d/, it was significantly more frequent after the voiced alveolar.

In three studies on the production of *-ed* preceding the present one, Delatorre (2004, 2005, 2006) found that both intermediate and advanced students produced more epenthesis following voiceless consonants; however, the differences were not statistically significant.

3. The influence of cluster length

In regard to cluster length in initial and final positions, Greenberg (1978) states that systems which present sequences of length *m*, present at least one sequence of length *m – 1* and contain similar properties, such as sonority sequences in violation or not. Comparing these systems, Eckman (1987b) and Eckman and Iverson (1994) argue that they present the same pattern of difficulty to L2 learners in regard to markedness in terms of length, that is, the difficulty increases with length.

Concerning Brazilian EFL learners, studies have found contrasting results for the production of vowel prothesis in relation to cluster length in initial /s/-clusters. Cornelian Jr. (2003), Delatorre (2004) and Rauber (2002, 2006) observed that the more marked three-member clusters cause more modifications than the less marked two-member clusters, despite the lack of statistical significance in the results of the first two studies. However, Rebello's (1997) and Rebello and Baptista's (2006) studies yielded different results, that is, the two-member clusters were more frequently modified by vowel prothesis than three-member clusters. The cause for such an inversion was suggested to be participants' voicing of /s/ in two-member sonorant clusters, forming a more marked /zC/ cluster.

Investigating the production of final three- and two-member clusters formed with the addition of the *-ed* morpheme to the previous consonant, Delatorre (2005) observed that Brazilian EFL intermediate learners modified three-member clusters by vowel epenthesis more frequently than two-member clusters, and the results obtained were statistically significant ($p < .05$).

4. Method

This study investigated three hypotheses. The first hypothesis, based on Hooper's (1976) consonantal strength hierarchy, on Selkirk's (1984) SSG, and on Eckman's (1987a) MDH predicted that consonants preceding *-ed* would cause more epenthesis than vowels. The second hypothesis, based on Greenberg (1978) and on Eckman's (1987a) MDH predicted that voiced obstruents would induce more vowel epenthesis than voiceless obstruents. The third hypothesis, based on Eckman's (1987a) MDH, Cornelian Jr. (2003), Delatorre (2004), Greenberg's (1978) and Rauber (2002, 2006), predicted that three-member clusters would be more frequently modified by vowel epenthesis than two-member clusters, as occurred in the cases of vowel prothesis in initial /s/ clusters.

The participants of the present study were twenty-six upper-intermediate level Brazilian EFL learners at the English Extracurricular Course at Universidade Federal de Santa Catarina (UFSC) who had taken around 270 hours of instruction previous to the data collection session.

The material used to collect the data was a sequence of ten paragraphs on the topics of recent events, such as the 2004 Olympic Games and the September 11th tragedy, and stories involving unreal characters (Appendix A). Only monosyllabic words were used in this study to avoid interference of stress placement or shifting.

The preceding consonantal contexts analyzed were /p, b, k, g, f, v, s, z, ʃ, tʃ, dʒ, m, n, l, r/ and the preceding vocalic contexts were /eɪ, oʊ, aɪ/. Each phonological context appeared at least one time in each of the three different monosyllabic words along with the ten paragraphs. Appendix B shows the verbs and clusters formed with the addition of *-ed* to the previous contexts. Each participant read and audio-recorded 91 *-ed* tokens, including 80 tokens with consonantal context and 11 tokens with vocalic contexts.

The data were collected in the first semester of 2005, in the language laboratory of UFSC using cassette tape recorders (Sony model ER5030) and head-mounted microphones (Sony model HS95). Students were divided into two groups to sit them in alternate desks to avoid background noise in the recordings. Participants were given the sheets containing the sequences of 10 paragraphs and were not allowed to take notes.

The English monosyllabic words ending in *-ed* produced by the participants were auditorially analyzed by three independent raters – the first author of this article and two advanced Brazilian EFL speakers with experience in EFL teaching and research. Each rater received the recordings, the texts and the lists of words produced by each participant to mark their answers according to the following criteria: (a) whether or not there was an epenthetic vowel in the *-ed* ending; (b) whether the verb was pronounced in the present tense; (c) whether the phonological context preceding the *-ed* ending was mispronounced; or finally, (d) whether the target word was replaced by another word. The criterion used to establish whether or not an epenthetic vowel was produced was agreement between two raters. When there was disagreement among the three raters, the researcher analyzed the token once more and decided. This fourth analysis was taken to avoid drastically reducing the number of tokens by discarding extra tokens since many of them had already been discarded due to mispronunciations.

The tokens were phonetically transcribed according to the International Phonetic Alphabet (IPA) and grouped according to the type of coda formed in their pronunciation. A total of 2,366 *-ed* ending words were analyzed by the three raters, but due to mispronunciations only 1,780 tokens were used to carry out the present study. Chi-square tests with the p .05 value and with 1 degree of freedom were applied to the results. The statistical analysis considered: (1) consonantal versus vocalic contexts to test hypothesis one; (2) voiced obstruents versus their voiced counterparts to test hypothesis two; and (3) three-member clusters versus two-member clusters test hypothesis three.

5. Results and discussion

This study investigated the production of vowel epenthesis in words endings in *-ed* by 26 BP speakers learners of EFL. From the 1,780 tokens used to carry out the study, the general results demonstrate that 78.14% of them were epenthesized in a paragraph reading test (Table 1). The following sections display the results of vowel epenthesis production for the three hypotheses tested in this study.

5.1 The influence of the preceding consonantal and vocalic contexts - Hypothesis 1

Regarding the first hypothesis, it was predicted that consonants as preceding context of *-ed* would induce more epenthesis than vowels. The results of the present study followed the expected tendency (Table 1).

Table 1. Rates of epenthesis after consonantal and vocalic contexts preceding *-ed*

	Consonants	**Vowels/Diphthong**	**Total**
N^{o} Prod	1,540	240	1,780
N^{o} Epen	1,271	120	1,391
% Epen	**82.53%**	**50.00%**	**78.14%**

As Table 1 demonstrates, the rates for vowel epenthesis production for consonants preceding the *-ed* morpheme were higher than the rates for vowels, as attested by the Chi-square test (χ^2 (1, N = 1,780) = 128.67, $p < .0001$), which yielded a statistically significant difference. These results corroborate those of Delatorre (2004, 2005, 2006) and suggest that markedness in terms of length of coda tend to influence vowel epenthesis production in words ending in *-ed* by Brazilians. This seems to be possible due to the creation of more complex, marked and, consequently, more difficult codas than those in which the *-ed* is preceded by vocalic contexts. Hypothesis 3 discusses the influence of coda length further.

Interestingly, the results on vowel epenthesis production in words ending in *-ed* followed the tendency observed in one of the studies on the production of vowel prothesis in initial /s/-clusters by Brazilians (Carlisle & Baptista, 2007), that is, consonants induced more vowel epenthesis than vowels. Thus, it seems that consonants tend to be more troublesome for Brazilians than vowels as preceding context. However, more research on the issue is needed. So far, it is not possible to make an statement on that since the studies on the production of words ending in *-ed* are incipient and the studies on initial /s/-clusters have yielded conflicting results regarding the influence of the preceding context, either consonantal, vocalic or silent.

Although it was not the aim of this study to investigate the effect of different vowels/diphthongs preceding *-ed*, the low production of epenthesis in verbs in which the diphthong /aɪ/ preceded *-ed*, called attention. The results for the three vocalic contexts are displayed in Table 2.

Table 2. Rates of epenthesis after diphthongs preceding *-ed*

	/eɪ/	**/oʊ/**	**/aɪ/**	**Total**
N° Prod	114	63	63	240
N° Epen	52	55	13	120
% Epen	**45.61%**	**87.30%**	**20.63%**	**50.00%**

As Table 2 demonstrates, the production of vowel epenthesis was higher after /oʊ/, than after /eɪ/, which was higher than that after /aɪ/. The comparison between /aɪ/ and /eɪ/ yielded a statistically significant difference, as demonstrated by the Chi-square test (χ^2 (1, N = 177) = 10.89, $p < .001$) as well as the comparison between /eɪ/ and /oʊ/, as attested by the Chi-square test (χ^2 (1, N = 177) = 29.49, $p < .0001$). Researchers in the field of English Phonetics and Phonology suggested that the pronunciation of *-ed* preceded by vocalic contexts is possibly influenced by vowel articulation, orthography/spelling or frequency of use/occurrence of the words in the TL (Andréia S. Rauber, Barbara O. Baptista and Michael A. Watkins, 2006, personal communication). However, the points raised here are just conjectures that need to be further investigated.

5.2 The influence of voicing of the preceding obstruent – Hypothesis 2

The second hypothesis predicted that the more marked voiced obstruents would induce vowel epenthesis more frequently than their less marked voiceless counterparts preceding the *-ed*. Nevertheless, the results show an opposite tendency and are displayed in Table 3.

Table 3. Rates of epenthesis after voiced/voiceless pairs of obstruents preceding *-ed*

	Bilabial Stops	Velar Stops	L-dental Fricatives	Alveolar Fricatives	Alveopal. Affricates	Total
N° Prod [-Vd]	218	238	89	169	67	781
N° Epen [-Vd]	197	212	73	143	65	690
% Epen [-Vd]	**90.36%**	**89.07%**	**82.02%**	**84.61%**	**97.01%**	**88.34%**
N° Prod [+Vd]	47	59	94	104	44	348
N° Epen [+Vd]	45	50	75	78	38	286
% Epen [+Vd]	**95.74%**	**84.74%**	**79.78%**	**75.00%**	**86.36%**	**82.18%**
Total N° Prod	265	297	183	273	111	1,129
Total N° Epen	242	262	148	221	103	976
total % Epen	**91.32%**	**88.21%**	**80.87%**	**80.95%**	**92.79**	**86.44%**

As Table 3 demonstrates, overall, the rates of vowel epenthesis production for voiceless obstruents preceding *-ed* were higher than the rates for their voiced counterparts in the same position, as attested by the Chi-square test (χ^2 (1, N = 1,129) = 7.80, $p < .005$), with significant statistical difference. These results corroborate those of Delatorre (2004, 2005, 2006) in which the voiceless preceding contexts induced more epenthesis as well, but contradict the predictions, following exactly their opposite tendency. Except for the bilabial stop pair, the other pairs of obstruents followed the tendency of voiceless counterparts inducing more epenthesis than the voiced ones. Chi-square tests for the pairs of obstruents by voicing showed that the only statistical significance was for alveolar fricatives and alveopalatal affricates. These results and those of Delatorre's previous studies suggest that voicing influenced the production of vowel epenthesis in words ending in *-ed*, but in the opposite direction of the MDH and of Greenberg's universals (preference for voiceless consonants or clusters over voiced consonants or clusters to occur in final position).

These results are in consonance with Hooper's (1976) strength hierarchy and Selkirk's (1984) sonority hierarchy since these hierarchies attribute different consonantal strength/sonority values for voiced and voiceless obstruents. Overall, voiceless obstruents are considered stronger/less sonorant than their voiced counterparts, which may possibly explain why voiceless obstruents preceding the *-ed* have induced more epenthesis than their voiced counterparts in the same context. Thus, the results of this study seem to indicate that markedness in terms of sonority/consonantal strength has a stronger influence than markedness in terms of voicing on the production of vowel epenthesis in words ending in *-ed* by Brazilian EFL learners.

5.3 The influence of cluster length – Hypothesis 3

The third hypothesis predicted that final three-member clusters would be more frequently epenthesized than two-member clusters in words ending *-ed*. The results are displayed in Table 4.

Table 4. Rates of epenthesis production by cluster length including *-ed*

	two-member clusters (/pt, kt, ft, st, ʃt, tʃt, bd, gd, vd, zd, dʒd, md, nd, ld, rd/)	three-member clusters (/spt, skt, mpt, ŋkt, lpt, rkt, lft, rft, kst, nst, rtʃt, lvd, rvd, ndʒd, lmd, rnd/)
N° prod	1,089	451
N° Epen	867	404
% Epen	**79.61%**	**89.57%**

As Table 4 demonstrates, the results followed the expected tendency, that is, final three-member clusters formed with the addition of the -ed morpheme to the previous consonantal context induced higher rates of vowel epenthesis than two-member clusters, as attested by the Chi-square test (χ^2 (1, N = 1,540) = 21.96, $p < .0001$), with significant statistical difference. These results corroborated those of Delatorre (2005), indicating that cluster length is possibly a relevant factor influencing the production of epenthesis in words ending in *-ed*. Moreover, the results of the present study comparing epenthesis production after consonantal and vocalic contexts may reinforce the claim that cluster or coda length has an influence on the production of vowel epenthesis in English words ending in *-ed* by Brazilians, since, as discussed above, consonantal contexts were more troublesome for Brazilians. These results are also in agreement with those of Weinberger (1987) and Hansen (2004), in which participants from different L1s tended to modify final three-member clusters more frequently than two-member clusters, which, in turn, were more frequently modified than single-final codas, either by vowel epenthesis or consonant deletion.

Furthermore, despite the specificities of initial and final clusters, and taking into account Greenberg's (1978) universals, it seems reasonable to say that the results of the present study corroborate those on the influence of cluster length investigating both vowel prothesis in initial /s/-clusters (e.g., Cornelian Jr., 2003; Delatorre, 2004; Rauber, 2002, 2006) and vowel epenthesis in final clusters in words ending in *–ed*, that is , longer clusters impose greater difficulty to Brazilian EFL learners, independently of position.

6. Conclusion

Vowel epenthesis was used to split final clusters in words ending *-ed* such as *stopped* and *planned*, which were frequently pronounced as [stɔped] and [plæned]. Interestingly, vowel epenthesis was also used in verbs where *-ed* followed the nucleus of the syllable, such as in *played* and *cried*, which were frequently pronounced as [pleɪed] and [kraɪed].

The results that followed the expected tendencies were those for Hypothesis 1, predicting that the preceding consonantal context would induce more epenthesis than the preceding vocalic context and for Hypothesis 3, predicting that the final three-member clusters would induce more epenthesis than two-member clusters. Hypothesis 2, which predicted that voiceless obstruents would induce less epenthesis than their voiced counterparts, was not supported by the data in this study. These results indicated that markedness in terms of coda/cluster length and sonority sequencing/consonantal strength are important factors affecting the production of vowel epenthesis in English words ending in *-ed* by Brazilian EFL learners. However, there seems to be consensus among researchers in the field of Phonetics and Phonology and Brazilian teachers of English for orthography to play an important role in the Brazilian EFL learners' mispronunciation of final *–ed*. The present study did not investigate the variable, though.

As for the pedagogical implications, one suggestion is to provide opportunities for practice having in mind the level of difficulties attested by the study, beginning with the codas that induced less epenthesis, words in which *-ed* is preceded by vocalic contexts, following with preceding consonantal voiced contexts, and then with consonantal voiceless contexts. Another suggestion is to consider cluster length while dealing with preceding consonantal contexts. Two-member clusters such as in the words *loved* and *liked* should be taught/trained before three-member clusters, such as in *served* and *worked*.

A third suggestion is to take L1 transfer into consideration and deal with the *-ed* form of words ending in alveolar stops, such as in *wanted* and *needed* after the teaching/training of the other two pronunciations. A further suggestion is to establish comparison between words containing final clusters with the same pronunciation of words ending in *–ed*, such as in the

pairs *act/liked*; *hand/trained*; *made/played*. Formal instruction about the three different *-ed* pronunciations should be provided as soon as students start to use the simple past tense to raise awareness and stimulate improvement of perception and try to avoid fossilization of the wrong forms.

The limitations of the study are mainly related to the exclusive use of monosyllabic words and to the type of data collection restricted to paragraph reading test. It seems important that future research includes the investigation of longer words using different types of tasks. Besides that, further suggestions concern the investigation of the role of orthography as well as of perception of *-ed* forms, and the necessity of dealing with Brazilians and other EFL speakers of different levels of proficiency.

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Appendixes

Appendix A: Paragraphs read by the participants

1 - The puppy

The child cried a lot when her mother told her her puppy had died. The little dog was killed by a car that passed by on the street. The girl prayed it could be alive but her father called a veterinarian and it was too late. She touched it for the last time and kissed him goodbye. Then, she slept in her father's arms.

2- A terrible day

George woke up late that day. He washed his face and brushed his teeth very quickly. He didn't have breakfast, but even so, he missed the bus. He wished so much he had a car! However, he had never saved enough money to buy one. He tried to take a cab, but he remembered there was a strike. So, lucky George walked fast to work. He worked hard that day and at the end of the day, his boss said that the company was going to be closed soon.

3 - Olympic Games

In Athens 2004, Brazil had the best performance in the Olympic Games ever. The male volleyball team played against the Italian team and won the gold medal for the second time. Many Brazilian families watched the game that Sunday morning. At the end, all Brazilians were very proud of their team. A number of Brazilian athletes helped Brazil to be ranked in 18th place. Maybe the country could have reached 16th place if the Brazilian marathonist had not been stopped by a mad guy. Then, Vanderlei Cordeiro de Lima was the third. When he entered the stadium, the crowd cheered him with enthusiasm. The crazy guy was arrested but not judged guilty.

4 - September 11th

That was the day nine terrorists attacked the United States. The first and the second attacks happened in New York and the third one in Washington. Four planes were used in the attacks. The terrorists were mixed with the other passengers. They said they were linked to Osama Bin Laden. Many policemen and firemen risked their lives to save people. Everywhere people stopped and prayed for the victims. People who lived in New York were scared and afraid of new attacks. Many Brazilians changed their minds and moved back to Brazil after September 11th. After that the United States bombed Afghanistan and Iraq. They claimed it was an act to find and punish Bin Laden who, according to the American government, caused the war.. The government didn't accept arguments against the war although many people asked for a stop all over the world.

5 - Primitive people

This story is about an ancient culture in which people liked practicing different sports. Every year they planned what they were going to do and trained for the competitions. During the summer they climbed hills, jogged, rowed, golfed and surfed. In the winter, when it snowed, the women worked on handcraft while the men hunted and played ball games. When they won the game, they raised a flag

with their left hand. As a tradition, the winner of the season got married on that day. After the ceremony, the tribe gathered together, talked, danced and laughed a lot.

6 - The robber
Yesterday, the police arrested a robber who used to spend some time watching an area before he mapped it. Ten days before, he camped near the house he intended to rob and studied the family's routine. Then, he waited till the moment the owners went out and jumped over the wall and broke into the house. He robbed all he could and shared with a friend. The police solved the case immediately because the guy was filmed by the safety system and then they found the campsite.

7 - Technology
Human society has searched for new technologies throughout time. In the beginning, men made fire of the wood. Some time later, they started to use stored food, which would be served throughout the years. With the development of electricity, human society has been dogged by the necessity of creating new things all the time. Interesting creations have been the lift and the stereo where the sound of the era could be heard. Nowadays, plugged to a computer, text can be filed and mailed everywhere instantly.

8 - Good Friends
Last Friday John went downtown and parked his car near the shopping center. Suddenly, he saw a man who looked like his friend Paul. John didn't expect to meet Paul there, but he crossed the street and called the guy. When the guy turned his head, John saw that, in fact, it was not Paul but a very old friend that had just arrived from a long trip around the world.

9 - Bus-driver
Mr. Smith learned to drive when he was 12. At a young age he became a bus-driver. One day the bus broke down. He slowed down, stopped the bus and the passengers left it. Mr. Smith phoned a mechanic. After half an hour, the mechanic came. He checked transmission and fixed it. When Mr. Smith realized that the time spent to fix the bus ranged from 3 to 5 minutes, he made an important decision: He decided he was going to take a course and learn how to fix engines. Nowadays, Mr. Smith owns a chain of fancy garages.

10 - Children
Peter and Helen are brother and sister. They generally play together but yesterday Peter got sick. He coughed whole night and when he woke up in the morning he couldn't go to school. He stayed in bed until his sister got back home from school. She thought he was asleep, so she passed near him and grabbed his sandwich. Peter screamed and their parents were miffed. They grasped both children's hands and took them to the dinner table. Peter's parents hoped he would be fine next morning and he was. However, the following day at school, Peter's teacher said he had skipped most of the activities during the last days he was sick. In fact, Peter got what he wanted: he loafed a lot at home while he was sick.

Appendix B: List of words ending in *-ed* grouped according to coda constituency

Two-member clusters		Three-member clusters		Vowel/diphthong + /d/	
/pt/	stopped, mapped, hoped, skipped	/spt/	grasped	/eɪd/	played, prayed, stayed
/bd/	robbed, grabbed	/skt/	asked, risked	/oʊd/	rowed, snowed, slowed
/kt/	walked, talked, liked, looked like, checked	/mpt/	jumped, camped	/aɪd/	cried, tried, died
/gd/	jogged, dogged, plugged	/ŋkt/	linked, ranked		
/ft/	laughed, coughed, miffed, loafed	/lpt/	helped		
/vd/	saved, lived, moved	/rkt/	worked, parked		
/st/	missed, passed, kissed, crossed	/lft/	golfed		
/zd/	closed, used, caused, raised	/rft/	surfed		
/ʃt/	washed, brushed, wished	/lvd/	solved		
/tʃt/	touched, watched, reached	/rvd/	served		
/dʒd/	judged	/kst/	mixed, fixed		
/md/	climbed, bombed, claimed, screamed	/nst/	danced		
/nd/	trained, planned, phoned	/rtʃt/	searched		
/ld/	killed, called, filed, mailed	/ndʒd/	changed, ranged		
/rd/	cheered, scared, shared, stored	/lmd/	filmed		
		/rnd/	turned, learned		