The Discrepancy between Naturalistic and Experimental Studies: The Case of the Initial Prosodic Template in Brazilian Portuguese

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1. Introduction

This paper aims at investigating the initial prosodic template in the acquisition of Brazilian Portuguese (henceforth BP) and the influence of the methodology on the results reported so far.

Studies on different languages (e.g. Gerken 1994 for English, Fikkert 1994 for Dutch, Prieto 2005 for Catalan, Adam and Bat-el 2007 for Hebrew) have identified trochees (SW[1]) as the prosodic template of the first words and interpreted this result as an evidence for a universal bias in early stages of the acquisition process. The investigation began with Allen & Hawkins (1979) in a work that briefly reviewed the child data from some languages (English, German, Spanish, among others) and suggested that children's early words tend to have a trochaic rhythm. In a subsequent study, Allen & Hawkins (1980) undertook a production study where children aged 3;7 -6;7 (year; month) were presented with non-sense words similar in segmental content, but contrasting in the stress position (e.g. [ta.'ki] and ['ta.ki]). Children perceived the difference between SW and WS words but had difficulty in producing WS (either producing words with stress error or deleting the initial syllable). Based on the results, the authors proposed the Trochaic Bias Hypothesis, which states that children start with a universal trochaic tendency for early words.

Although, in general, studies on Germanic languages tend to corroborate Allen and Hawkins' hypothesis (e.g. Gerken 1994; Fikkert 1994, Demuth 1996), there are other studies that do not deny the predominance of trochees but point out to the presence of iambs in early speech as well (Kehoe & Stoel-Gammon 1997; Vihman *et al*. 1998). Studies on Romance languages also show different results. For instance Hochberg (1988) asserts that there is no initial prosodic bias in early Spanish but a neutral start instead, i.e. stress does not fall on any specific syllable; whereas a trochaic bias is found in Catalan (Prieto 2005), an initial WS tendency is found in European Portuguese (Correia 2010) and in French (Demuth & Johnson 2003; Vihman *et al.* 1998).

Data from Portuguese-speaking children bring complications for the assumption of a universal trochaic bias. Despite the prolific discussions and studies about the initial prosodic template in Portuguese that have taken place recently (Rapp 1994; Santos 2001, 2006, 2007; Bonilha 2004; Baia 2008), some questions still remain on the shape early words in Portuguese. On the one hand, most of these studies are observational and they all claim that there is an initial iambic bias (Santos 2001, 2006, 2007; Bonilha 2004). On the other hand, the only experimental study undertaken on BP (Rapp 1994) claims for a trochaic bias.

* The study is part of the MA thesis of the first author. We are grateful to Daniel Peres, Nicholas Flynn, the audience at LARP, in particular to Ian Maddieson and Jeffrey Steely, and to two anonymous reviewers for their comments and suggestions. The remaining mistakes are our own. Our thanks also to Fapesp (grant 2006/00965-2, second author) and CNPq (grants 134328/2006-0, first author; 308135/2009-1, second author). Contacts: baiamfa@usp.br & raquelss@usp.br .

[1] In this paper we use S to annotate strong syllables, W to annotate weak syllables, and M when the production is one-syllable long (monosyllables).

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Therefore, we can see that the picture is far from clear on the matter of if there is a prosodic template in the first words, and why this template occurs, in case of a positive answer. Our intention here is to bring some light to the matter, looking at a different perspective; that is, that the methodology employed may be affecting the results found.

2. Previous Studies on Brazilian Portuguese and Hypotheses

Brazilian Portuguese (BP) presents an interesting prosodic behavior. According to Cintra (1997), the language has more trochees (63%) than iambs (18%) (see also Albano (2001) for a different account with the same results). However, data from child language have suggested an unclear bias, which is not consistent with frequency data in the adult speech.

Most of these studies on BP acquisition are naturalistic and they assert that there is an initial iambic bias. By analyzing the spontaneous speech of two Brazilian children, Santos (2001) points to a strong initial tendency, both in nouns and verbs, in the early words (until 1;6 years old). This result is corroborated by Bonilha (2004), who showed that there is a larger number of iambs until 1;5 in the speech of one Brazilian child. After that age, the child is able to produce the adult prosodic pattern of BP (trochaic words). Finally, Santos (2006, 2007), doing a statistical analysis of the children's first words, showed that in BP there is an iambic bias, as monosyllables are produced as WS and WSW words are truncated to WS and not SW, both for nouns and verbs. She then argues that the difference in results from the Germanic languages is because there is no initial value for the headedness parameter, as claimed by early studies (e.g. Fikkert 1994; Archibald 1995). Following Lee (1994), who shows that the trochaic tendency in adult BP results from an algorithm with an iambic foot plus an extrametrical syllable, Santos states that children's first words reflect the early setting of the parameter for foot headedness, and while extrasyllabicity was not yet acquired. That would be the reason why Germanic languages show an early tendency for trochees while in BP the early tendency is for iambs.

Someone could claim that, as found by Prieto (2005) in Catalan, maybe child directed speech has a different prosodic tendency from adult language, and this fact could explain the discrepancy between adult and child language. This is not the case, as shown by Santos (2007). The author compared the numbers found by Cintra with the results from child directed speech and child speech. She showed that, although in child directed speech there are less trochees, the number of iambs does not increase; what increases is the number of monosyllables, when compared to adult language. On the other hand, in children's speech, there are more iambs than monosyllables. Hence, child directed speech might not be driving the early iambic bias found in BP child data and the discrepancy is still unexplained.

To make things even more difficult to explain, the only experimental study on BP (Rapp 1994) states that there is a trochaic bias in children's first words, what makes the results differ significantly between naturalistic studies (that point to an iambic bias) and experimental studies (that point to a trochaic bias). Rapp, in a study on weak syllables deletion, studied 8 children, from 1;6 to 2;0, and analysed 393 tokens. An important difference from this study and the ones above is that it dealt only with one grammatical category, nouns.

Therefore, the difference in results from Rapp on one hand with the ones from Santos and Bonilha, let us raise the question of whether the discrepancy between these results stems from the methodology employed, and this is the main hypothesis we will follow in this paper. Specifically, we hypothesize that:

- There will be different periods showing different distribution of the prosodic templates, as the language acquisition proceeds;
- The method (experimental or naturalistic) can have some influence on the results;
- The type of words analysed may be one of the methodological problems – that is, in experimental studies the words analysed are only nouns, while in naturalistic studies both nouns and verbs are taken into account.

3. Methodology

Data on BP consist of i. spontaneous speech from one BP-speaking child aged 1;5-3;0 (1177 words: 761 nouns/416 verbs); ii. experimental data set from 42 Brazilian children aged 1;5-3;0 (1565 words – only nouns). The experimental study consisted of a naming task in which children had to help

puppets to say the name of drawings. The naming task was balanced[2] in a way to have the same number of prosodic templates: SW, WS, SWW, WSW, and WWS. The position of stress in children's productions was determined by auditory phonetic transcriptions done by two transcribers, who are phonologists. The transcribers worked independently and agreed more than 80% of the time about the stress placement in children's production. The different judgements were discussed by the two transcribers until they reached a consensus.

4. Results

In this section we present first the results regarding the differences in the distribution of the prosodic templates (henceforth PT) produced by children in the course of the development. Latter, we present the distribution of the PTs in the two corpora analyzed, taking into account the results on the development. For the statistical analyses, ANOVA and F-Test are used, with significance set at $p < .05$.

4.1. Age Groups

In order to check our first hypothesis, we verified how the different prosodic patterns appeared in the children's production.[3] Three age groups (AG) were initially created based on similar intervals: AG1 (1;5 – 2;0), AG2 (2;1 – 2;6) and AG3 (2;7 – 3;0) and they were tested using One-Way ANOVA in R (version 1.13.0), testing the distribution of each template in the experimental and naturalistic data.

In the experimental data, in general, the following PTs showed statistically significant distribution: M ($F(2,39) = 12.158$, $p < .05$), SWW ($F(2,39) = 28.203$, $p < .05$), WSW ($F(2,39) = 27.892$, $p < .05$) and WWS ($F(2,39) = 27.177$, $p < .05$). Other PTs did not show significant differences in distribution.

In the naturalistic data, in general, as in the experimental data, the majority of the distributions of trisyllables showed statistically significant differences between the groups: WSW ($F(2,17) = 21.745$, $p < .05$) and WWS ($F(2,17) = 3.8793$, $p < .05$). Other PTs did not show significant differences in distribution.

As can be seen in Table 1, the multiple comparison test shows the result of comparison between each two groups and in which interaction the difference between groups was significant (p adj):[4]

Age Groups (Experimental data)	M	SW	WS	SWW	WSW	WWS
AG2 – AG1	**0.034**	0.964	0.758	0.245	**0.000**	0.169
AG3 – AG1	**0.000**	0.621	0.367	**0.000**	**0.000**	**0.000**
AG3 – AG2	0.082	0.457	0.809	**0.000**	0.082	**0.000**
Age Groups (Naturalistic data)						
AG2 – AG1	0.879	0.259	0.714	0.595	**0.000**	0.357
AG3 – AG1	0.990	0.512	0.449	0.595	**0.000**	**0.033**
AG3 – AG2	0.941	0.883	0.908	1.000	0.500	0.427

Table 1: Tukey's Multiple Comparisons Test – comparison of PTs means

As we can see, the quantity of syllables seems to play an important role in the distribution between groups as we observe significance in the interaction between monosyllables/trisyllables and the age groups. So we grouped all templates according to the word shape, i.e. disyllables and trisyllables (monosyllables were already grouped and verified in the first ANOVA test, where we observed a significant interaction between M and AGs in experimental data). The role of word shape in the groups was verified by conducting One-Way ANOVA. On the one hand, the results showed that disyllables are

[2] One particular problem in Rapp's study was that the author did not balance the quantity of different word template tested, ending with more SW words than WS words (49 tested words: 43% SW, 36,7% WS and 20,3% SWW).

[3] We stress that since we are interested in children's tendency, the results presented in this section and the following one came from children's production, regardless of the target word. That is, a children's SW word can either be the correct production of an adult SW word or the result of a truncation of a trisyllable, for example.

[4] In bold we highlight the significant results.

not distributed in a significant way between the groups of the experimental ($F(2,39)= 0.2017$, $p > .05$) and naturalistic data ($F(2,17)= 0.1823$, $p > .05$). On the other hand, the results showed that trisyllables, in general, point to differences between the groups in the experimental ($F(2,39)= 37.881$, $p < .05$) and naturalistic data ($F(2,17)= 22.432$, $p < .05$).

4.2. Experimental study

In order to compare Rapp's results with ours, only nouns were used in this experimental study. In general, iambic words were more prone to be truncated to monosyllables (cf. 1-2); there were more WSW trisyllables than SWW or WWS (cf. 3-4); stress errors favoured iambs (cf. 5-6); and children's few lexical creations favoured iambs (cf. 7-8):

		Target	**Child Production**		
(1)	boné	[bo.'n ɛ]	[nɛ]	*cap*	J.P 1;8
(2)	avião	[a.vi.'ãw]	[ãw]	*airplane*	D.T 2 ;1
(3)	boneca	[bo.'n ɛ.kɐ]	['ɛ.kɐ]	*doll*	E.S 1;8
(4)	estrela	[es.'tɾe.lɐ]	[e.'te]	*star*	L.G 1;9
(5)	uva	['u.vɐ]	[u.'va]	*grape*	J.P 1;8
(6)	ovo	['o.vʊ]	[o.'va]	*egg*	C.M 2;1
(7)	copo	['kɔ.pʊ]	[bi.'bi]	*cup*	P.C 1;5
(8)	bola	['bɔ.lɐ]	[di.'ko]	*ball*	J.V 2;1

Table 2 summarizes the results found in raw numbers and percentage and Table 3[5] shows that for the three age groups there were more trochees than iambs. However, F-test showed that the predominance of trochees is only statistically significant at AG1, which seems to replicate Rapp's (1994) findings for BP early words.

Nouns	**SW**	**WS**	**WSW**	**SWW**	**WWS**	**M**
AG1	198 (41%)	116 (24%)	16 (3.3%)	5 (1%)	8 (1.6%)	141 (29.1%)
AG2	191 (37%)	144 (28%)	64 (12.4%)	25 (4.9%)	33 (6.3%)	59 (11.4%)
AG3	173 (30.7%)	147% (26%)	89 (15.8%)	54 (9.5%)	80 (14.1%)	22 (3.9%)
Total	562 (36%)	407 (26%)	169 (10.8%)	84 (5.3%)	121 (7.8%)	222 (14.1%)

Table 2: Children's production according to the age group and prosodic template in the experimental data.

Nouns	**Prosodic Template: > or <**	**P-Value (F-Test)**
AG 1	**SW > WS**	**0.049**
AG 2	SW > WS	0.564
AG 3	SW > WS	0.400
Total	**SW > WS**	**0.042**

Table 3: Experimental Study - SW *vs* WS and p-value for the F-Test

4.3. Naturalistic Study

For the naturalistic study, we considered all children's production of nouns and verbs that adults could recognize as words and we analysed each category separately. That included not only words from the adult lexicon, but also familiar words (babytalk) and children's lexical creation (provided that the caretaker identified the production as a word).

[5] The second column shows wich of the prosodic patterns is more frequent. For example, in SW > WS, SW outnumbers WS.

i. Nouns

In general, trochaic words were more prone to be truncated to monosyllables (cf. 9-10); there were more WSW trisyllables than SWW or WWS (cf. 11-12); stress errors favoured iambs (cf. 13-14); and children's lexical creations favoured iambs (cf. 15-16):

(9)	livro	[ˈli.vɾʊ]	[li]	*book*	LUI 1;5
(10)	gato	[ˈga.tʊ]	[ga]	*gato*	LUI 1;5
(11)	cavalo	[ka.ˈva.lʊ]	[ka.ˈva.lʊ]	*horse*	LUI 1;9
(12)	estrela	[es.ˈtre.lɐ]	[is.ˈte.lɐ]	*star*	LUI 2;1
(13)	pipa	[ˈpi.pɐ]	[pi.ˈpa]	*kite*	LUI 1;8
(14)	água	[ˈa.g^{w}ɐ]	[a.ˈwa]	*water*	LUI 1 ;9
(15)	coelho	[ko.ˈe.ʎʊ]	[pe.ˈni]	*rabbit*	LUI 1;5
(16)	livro	[ˈli.vɾʊ]	[bu.ˈbu]	*book*	LUI 1;6

ii. Verbs

Similarly to nouns, iambic verbs were more prone to be truncated to monosyllables (cf. 17-18); there were more WSW trisyllables than SWW or WWS (cf. 19-20); and children's few lexical creations favoured iambs (cf. 21-22). Interestingly, we did not find any case of stress errors in verbs:

(17)	abrir	[a.ˈb ɾiɾ]	[bi]	*to open*	LUI 1;6
(18)	estão	[es.ˈtãw]	[tãw]	*(they) are*	LUI 2;4
(19)	chorando	[ʃo.ˈɾã.dʊ]	[ʃo.ˈã.dʊ]	*crying*	LUI 2;1
(20)	tocando	[to.ˈkã.dʊ]	[to.ˈkã.dʊ]	*playing*	LUI 2;2
(21)	comer	[ko.ˈmeɾ]	[ne.ˈɲe]	*to eat*	LUI 1;5

Table 4 summarizes the results from the naturalistic data and Table 5 shows the statistical relevance of the data, taking into account only children's production (that is, regardless of the target).[6] As can be seen, in the case of nouns there was an inversion in the quantity of data. At AG1 there were more WS than SW, while at AG2 and AG3 the SW outnumbered WS. Even so, the difference between WS and SW were not statistically significant at AG1 and AG2. Only at AG3 there was a statistically significant difference.

Similarly to verbs, WS outnumbered SW at the three age groups. However, at no age group this difference was statistically significant.

Finally, when plotting together nouns and verbs, we can see that a significant difference from WS and SW emerges at AG1. At the other age groups, SW outnumbered WS, but the difference was not statistically significant.

[6] N stands for noun and V stands for verb.

		SW	WS	WSW	SWW	WWS	M
N	AG1	108 (38,2%)	153 (54,2%)	11 (4%)	0 (%)	0 (%)	10 (3,6%)
	AG2	117 (43,7%)	83 (31%)	51 (19%)	1 (0,3%)	5 (1,9%)	11 (4,1%)
	AG3	109 (51,7%)	45 (21,3%)	41 (19,4%)	1 (0,5%)	6 (2,9%)	9 (4,2%)
TOTAL		**334** (43,9%)	**281** (37%)	**103 (**13,5%)	**2** (0,2%)	**11** (1,4%)	**30** (4%)
V	AG1	52 (32%)	80 (49%)	0 (0%)	0 (0%)	5 (3%)	26 (16%)
	AG2	41 (33,3%)	44 (35,8%)	20 (16,2%)	0 (0%)	6 (4,9%)	12 (9,8%)
	AG3	36 (27,7%)	49 (37,6%)	19 (14,7%)	0 (0%)	12 (9,2%)	14 (10,8%)
TOTAL		**129** (31%)	**173** (41,6%)	**39** (9,3%)	**0** (0%)	**23** (5,6%)	**52** (12,5%)
N + V	AG1	160 (36%)	233 (52,3%)	11 (2,5%)	0 (0%)	5 (1,1%)	36 (8,1%)
	AG2	158 (40,5%)	127 (32,4%)	71 (18,1%)	1 (0,2%)	11 (2,9%)	23 (5,9%)
	AG3	145 (42,6%)	94 (27,6%)	60 (17,5%)	1 (0,3%)	18 (5,2%)	23 (6,8%)
TOTAL		**463** (39,3%)	**454** (38,3%)	**142** (12%)	**2** (0,2%)	**34** (2,8%)	**82** (7,4%)

Table 4: Children's production according to the age group and prosodic template in the naturalistic data.

		ProsodicTemplate: > or <	P-Value (F-Test)
N	AG 1	SW < WS	0.188
	AG 2	SW > WS	0.063
	AG 3	**SW > WS**	**0.021**
	Total (Avg.)	SW > WS	0.065
V	AG 1	SW < WS	0.717
	AG 2	SW < WS	0.299
	AG 3	SW < WS	0.515
	Total (Avg.)	SW < WS	0.921
N + V	AG 1	**SW < WS**	**0.031**
	AG 2	SW > WS	0.264
	AG 3	SW > WS	0.485
	Total (Avg.)	SW < WS	0.194

Table 5: Naturalistic Study – SW *vs* WS and the p-value for the F-Test

5. Discussion

Interestingly, our findings corroborate what has been reported by both the experimental (Rapp 1994) and the naturalistic studies (Santos 2001, 2006, 2007; Bonilha 2004; Baia 2008). That is, a trochaic and an iambic bias in the early productions, respectively.

But before discussing this result, let's go back to the hypotheses raised in section 2. Our first hypothesis was that we could find a change in the tendency of prosodic patterns as the acquisition process develops. We proposed 3 age groups that were confirmed by the statistical analysis. An interesting result was that this age groups were confirmed only by monosyllables and trisyllables (SWW, WSW and WSW), not by the two-syllable words. One could argue, therefore, that the change we found results not from the position of the stress in the word, but from the number of syllables a word can have. This is a possible analysis that must be taken into account. Demuth and Fee (1995) argued that children went to 4 stages in the development of phonological words, based on the size of children´s production. First, children would produce monosyllables (core syllables); in a second stage, children would produce minimal words; in the third stage, words would be one-foot size; in a fourth

period, words would be two-stress-feet; and finally, words became adult like. While our results corroborate part of Demuth and Fee's analysis, as there was an increasing in the quantity of syllables in the word during the acquisition process, when we look specifically at two-syllable words, we found different results than the ones found by them, not supporting an initial trochaic tendency.

By analysing data distributed in three different groups, we observe that in the experimental corpus a trochaic tendency was found in the three AGs, but that was only significant at AG1. One could ask why only at AG1 this tendency appears and not at AG2 and AG3, since BP is a trochaic language. The reason can be that at AG1 children is producing trissylables as two-syllables words, while at AG2 and AG3 children produces more trissylables, which diminishes the number of dissilables in children´s production.

We did not find the same tendency in the spontaneous corpora. When we look at the results for nouns in the naturalistic corpora we find an initial iambic tendency (already found by Santos 2001, 2007; Bonilha 2004), although not statistically significant. One of the reasons for that can be the kind of words analysed. In the experimental corpus, the nouns tested were controlled and equilibrated according to the prosodic templates. In the naturalistic corpus, all nouns were considered, regardless whether they appear in adult language or not. Santos (2007) and Baia (2008) have already called the attention that children's lexical creation and baby talk are majority iambs in BP. So this can be the reason for the difference in results between the two corpora. One finding for which we do not have an explanation is that why there was a significant difference in AG3 for nouns.

But we also need to take into account that the naturalistic data has more than nouns in the corpus. When other types of words are considered (in our case, verbs), a predominance of WS production emerges in the early stage of language acquisition. The results showed that when we take into account verbs and nouns, an iambic tendency also appears at AG1, and the tendency of trochees at AG3 disappears. These results confirm our second hypothesis (that the difference between the results of the experimental study and naturalistic ones is due to the method employed), and the findings point to the fact that caution is needed when we are generalizing results. Although Rapp's findings were corroborated, a different corpus showed that her analysis was misleading from the corpora analysed.

The third hypothesis pursued in this paper was that the kind of word analysed could be one of the specific reasons that affect the analyses. Specifically, we hypothesized that the lexical category would play a role in the distribution of the prosodic patterns. In fact, most of the studies on the prosodic development dealt only with nouns and conclude that early words show a trochaic template (e.g. Allen & Hawkins 1980, Fikkert 1994, Gerken 1994, Demuth 1996). However, this is not a consensual finding. However, some other studies on the phonological processes that affect the prosodic structures of words also show that these processes do not always yield a trochaic tendency (e.g. Taelman 2004 for Dutch). As far as we know, there are no studies on the acquisition of Germanic languages that analyzed verbs. We would expect, however, no difference in this case, as Germanic languages are trochaic in the adult form, both for verbs and nouns (in languages as English, Dutch and German but Swedish, Scottish and Norwegian do not show fixed stress (Trommelen & Zonneveld 1999). The point is that, for Romance languages, the position of primary stress differs in verbs and nouns resulting in trochaic and iambic forms (Lee 1994), while in Germanic languages the same trochaic tendency is found in both grammatical categories in adult language. Besides that, some analyses on Romance languages argue that although these languages show words with a surface trochaic form, these trochees (at least for nouns) result from an algorithm that generates an iambic foot extrametrical syllable. This is the case of BP, for example (cf. Lee 1994). In a word as *menino* ´boy´, the last vowel (therefore the last syllable) is counted for stress purposes. So, the algorithm of primary stress builds a two-syllable foot with right nucleus (an iamb) in the root. However, our results show that when we add a different grammatical category than nouns, a clear picture changes and becomes a little less clear. For instance, when we look only at nouns, both in naturalist data and the experimental data, SW outnumbered WS (although only at the experimental data the difference was statistically significant). When looking only at verbs, WS outnumbered SW, although this difference was not significant. However, when summing both grammatical categories the number of WS is significant larger than SW at AG1. By analyzing both verbs and nouns in BP, Santos (2007) argues against a universal trochaic tendency in early speech. However, the author points that assuming an iambic tendency would also not account for all the data as Dutch early speech is clearly trochaic (cf. Fikkert 1995). She concludes then that only a neutral start

would account for both languages, in the same vein as Hochberg (1988), who also analysed both verbs and nouns, arguing for a neutral start in Spanish.[7]

To sum up, from the data presented above, we showed that the study on initial word stress and the analyses on early prosodic patterns of BP must take into account all types of data (both experimental and spontaneous and words from different grammatical classes together). In fact, the two types of words, i.e. verbs and nouns, provide full information on Brazilian children's phonological processing during the early stages of acquisition.

6. Final Remarks

In this study, we addressed the question whether the methodology could affect the results regarding a possible tendency in the prosodic patterns in early speech. By analyzing language acquisition data on BP, we noticed that the same results observed in the previous studies on BP were found in this study. Specifically, we raised the hypothesis that different methodologies employed would affect the results found and this hypothesis was so confirmed: experimental data showed a trochaic result while naturalistic data showed an iambic tendency. We also raised a second hypothesis following the previous one, that what was behind the difference in the results from naturalistic and experimental data was consequence of the kind of words tested in these two different methodologies. Generally, experimental tasks are nominalization tasks, therefore nouns are tested and verbs usually do not appear in this kind of corpora. On the other hand, in naturalistic studies children interact with their caretakers by using both verbs and nouns. Therefore, the methodological difference is not by the kind of elicitation task (experimental vs. naturalistic), but for the kind of words analysed. When only nouns were taken into account, a trochaic bias was found (the same tendency found in different languages); when both nouns and verbs were considered, an iambic tendency was found. Finally, a third hypothesis raised was that the predominance of iambs in BP would occur in a specifically period of the language acquisition process. As seen in the results, three different periods were found, according with the distribution of words with different shapes, and iambs prevailed over trochees at AG1 when nouns and verbs are considered.

We can conclude, based on these results, that BP does not show a trochaic bias, as claimed for other languages, neither a clear iambic analysis, which could be an alternative possibility. Moreover, we conclude that the analysis of different grammatical categories (that have a different prosodic template in adult language) is crucial in the investigation on the initial prosodic template as BP data showed they do not show the same biases.

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[7] Interestingly, Spanish shows the same kind of stress system than Portuguese (for example, Hooper & Terrell 1976 argue that the default case of stress assignment is to stress the final syllable of the stem; Den Os & Kager 1986 argues that Spanish has a trochaic foot but it is quantity sensitive).

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Selected Proceedings of the 5th Conference on Laboratory Approaches to Romance Phonology

edited by Scott M. Alvord

Cascadilla Proceedings Project Somerville, MA 2011

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Baia, Maria de Fátima de Almeida and Raquel Santana Santos. 2011. The Discrepancy between Naturalistic and Experimental Studies: The Case of the Initial Prosodic Template in Brazilian Portuguese. In *Selected Proceedings of the 5th Conference on Laboratory Approaches to Romance Phonology*, ed. Scott M. Alvord, 127-135. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #2641.