DOI: http://dx.doi.org/10.5007/2175-8026.2024.e98751

THE INTERPLAY AMONG ATTENTION, SELF-STEEM, BELIEFS, AND L2 PRONUNCIATION

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Abstract

The present study intends to investigate whether sustained attention, self-esteem, and beliefs about second language (L2) pronunciation and instruction interact with L2 pronunciation assessed by a reading task. Thirty-nine eighteen-year-old high school Brazilian students participated in the study and answered a beliefs form, Rosenberg's self-esteem scale (Rosenberg, 1965), and read a sixty-nine-word paragraph. They were all late learners of English as an L2. Twenty-nine participants took the d2-R test which is a Bourdon-style cancelation test validated to assess sustained attention. Statistical analyses were run on the data to verify correlations and effects of different variables. Results indicated that liking English correlated negatively with the number of mispronunciations produced. Also, the different processes assessed by the d2-r test yielded different correlations with the different categories of mispronunciation.

Key-words: L2 pronunciation; Self-esteem; Attention; Learners' beliefs.

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Introduction

The acquisition of a second language (L2) is recognized as a complex task (Mclaughlin & Harrington, 1989) that involves not only cognitive aspects but also social and affective aspects. Internal and external features such as learning context, frequency of use of the L2, and quality of use of the L2 influence the acquisition and processing of a target language (Dörnyei, 2009). In addition to the age at which acquisition begins and the place of learning, learners' external and internal worlds are characterized by constant change and evolution based on factors such as motivation, mood, concentration, among others. This dynamicity and interaction among so many factors characterize the acquisition and processing of the target language based on the interaction of different functional systems involving cognitive, affective, and motivational aspects (Dörnyei, 2009; De Bot et al., 2007; De Bot, 2017). Even in the highly complex and dynamic environment that surrounds the learner and their experiences, it is possible to find stability since there is a tendency towards balance in relation to the learner's internal factors (Nowak et al., 2005) in the presence of strong attractors such as a great goal or talent (Dörnyei, 2009). Stability, in turn, can be broken again by another force (Thelen & Smith, 1994) such as an intervention, rehabilitation, or therapy.

Based on the premise of stability, it is possible to investigate trends in individual learner differences in L2 acquisition and processing. All the research on the subject seeks to facilitate acquisition and performance in an L2 through the subsequent development of protocols, interventions, and teaching resources. The main cognitive aspect investigated in the present study is sustained attention (a.k.a. concentration performance) assessed by the Bourdon-style cancelation test valid to be used in Brazil with norms considering Brazilians from 7 to 76 years old, d2-R (Brickenkamp et al., 2019) and the affective aspects investigated are self-esteem assessed by the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and beliefs regarding English and pronunciation instruction. The present study aims at investigating the interplay among concentrated attention, self-esteem, beliefs towards English pronunciation instruction and L2 pronunciation of bilinguals who started learning the English language as an L2 after having acquired their first language (L1), in this case the Portuguese language, and are thus considered 'late bilinguals' who learned English in Brazil.

Historically, the value placed on pronunciation regarding L2 pedagogy has varied as teaching methods and approaches have come in and out of fashion. As Bettoni and Gallego-Campos (2017) state, even when learners' focus is written production and comprehension, phonological awareness and the grapheme-phoneme relationship should be used for the benefit of learning the target language. Moreover, a comparison between L1 and L2 phonologies can help anticipate some of the many learners' strengths and difficulties as explained by the Speech Learning Model – revised (SLM-r - Flege & Bohn, 2021) which emphasizes that the similarities between L1and L2 phonological system, and not only their differences, can be problematic. The SLM-r and the Perceptual

Assimilation Model for L2 (PAM-L2) (Best & Tyler, 2007) attribute a prominent role in speech learning to speech perception. Both models attest that the phonetic system of the L2 will be formed from the L1 and that, unlike what the old Contrastive Analysis claimed, phonemes perceived as totally different from those of the L1 may be less problematic, since they are more likely to be perceived as a new phoneme and to be categorized as such. One of the main differences between the two models is that the PAM-L2 states that the focus of attention in learning can be phonological, phonetic, or gestural while the SLM-r focuses on the acoustic qualities of speech.

Pronunciation has to do with both speech production and perception. Considering the listening comprehension of an L2 by beginner learners, most of the problems are related to the loss of parts of the text due to the non-recognition of words because of unclear pronunciation, speed of speech, and difficulties in segmenting words (Goh, 2000; Hasan, 2000; Liu, 2003; Bettoni & Pizolotto, 2022). Werker (2018) states that there are contrasts in the native language which are only accurately distinguished until a certain point in childhood; thus, late bilinguals have some difficulties in L2 perception affecting how the L2 is produced since L2 learners listen with an accent (Tyler, 2019). In addition, cognitive and affective aspects affect L2 production in terms of fluency, accuracy, and lexical density (Mota, 2003).

Bettoni (2022) pointed out that some mispronunciations, such as voicing of English word-initial /s/-clusters by Brazilian Portuguese learners of English as an L2, are only corrected when learners' attention is driven to the target sound or structure which highlights the importance of individual differences regarding cognition. Other mispronunciations that are more salient such as vowel epenthesis at the end of English words finished by stop consonants or palatalization of alveolar stops are usually corrected as the English proficiency level of the learn increases (Bettoni-Techio, 2005). The SLM-r also values the role of individual differences considering category precision as an endogenous factor related "to auditory acuity, early-stage (pre-categorical) auditory processing, and auditory working memory" (Flege & Bohn, 2021, p. 43). Attentional allocation and selective attention are also considered in the discussion of the SLM-r as important aspects when attributing the appropriate weights to each acoustic cue in the L2 category formation process.

Hopfinger and Slotnick (2021, p. 1) state that "the process of attention is critical for navigating and operating efficiently in everyday life, and deficits in this core process have serious consequences" such as causing a car accident during distracted driving. The most common definition of attention is the one attributed by the American Psychologist William James back in 1890. He defined attention as "the taking into possession of the mind, in clear and vivid form, in one out of what seem several simultaneously possible objects of trains of thought" (James, 1890, pp. 403-404) adding that "Focalization, concentration, of consciousness are of its essence". James believed that to deal with some information people had to ignore other information - select the input to focus on. Even though attention has

been defined differently by scholars following a diversity of theories, approaches, and goals, James's definition seems to be sufficient to introduce the basic psychological process of attention addressed in the present study and the types of attention that are considered – sustained attention and selective attention. Sustained attention has to do with concentration, it is the capacity to maintain attention on something over time (Dalgalarrondo, 2019). Selective attention is trying "to attend to only one source of information while ignoring other stimuli" (Eysenck & Brysbaert, 2018, p.94). Regarding attention to be domain specific or domain free, there is controversy. However, even the scholars who believe in domain specific attention, that is, who believe visual and auditory attention rely on separate mechanisms, have found positive intraparticipant correlations for visual and auditory attention suggesting that some brain structures of visual and auditory attention are the same as well as the attentional control mechanisms (Lin et al., 2021). The correlations, however, were not significant for participants with Attention Deficit and Hyperactivity Disorder (ADHD). Lin and colleagues (2021) found that people with ADHD have a higher deficit in visual than auditory attention and thus benefit more from hybrid and auditory learning resources than from visual ones.

That attention has been investigated in L2 studies (e.g., Darcye et al., 2014; Mora & Mora-Plaza, 2019; Bettoni & Garghetti, in press) is not surprising since attention is fundamental in learning in general (Dehaene, 2021; Fonseca et al., 2020). However, there is an important demand for more studies regarding L2 pronunciation and attention considering a variety of L1 and L2 combinations and addressing a diversity of external and internal variables (Bettoni, 2023). Besides attention, another individual difference that deserves consideration and is addressed in the present study is self-esteem. According to Hutz et al. (2014, p.85), "self-esteem is an evaluative aspect of self-concept and consists of a set of thoughts and feelings about oneself". Steinberg (1999 *apud* Hutz et al., 2014) found high and significant correlations between self-esteem and school achievement for adolescents, which represent the group of participants in the present study. Most studies addressing this construct apply the Rosenberg's Self-esteem Scale (1965) and so was done in the present study.

It has been already stated that to learn something, one must direct attention to their target. The amount of attention dedicated to something may also vary according to learners' beliefs regarding the learning target and the learning context. Therefore, learners' beliefs towards L2 pronunciation instruction may interfere with learning success. Also, Bettoni and Rizzi (2020) found that there was a significant correlation between disliking pronunciation instruction as well as being corrected by a teacher and being less comprehensible when speaking in English as judged by listeners from different countries.

Updated research with variable control to consider the variety of L1s and L2s as well as individual differences that affect cognitive and affective aspects is proving to be increasingly necessary and the research proposed here aims to be part of this scientific body. The main goal of the present study is to investigate

whether sustained attention, self-esteem, and beliefs about L2 pronunciation and instruction interact with L2 pronunciation assessed by a reading task.

Method

The present study is part of a research project submitted to and approved by the Research Ethics Committee for Human Beings of the Instituto Federal de Santa Catarina in the technical report 6.241.952. All procedures necessary for assuring participants' safety were taken when collecting, analyzing, and reporting the data. The study is a cross-sectional exploratory study.

Participants

Thirty-nine (seventeen females) eighteen-year-old Brazilian high school students who learned English as an L2 after having already acquired their L1, Brazilian Portuguese, therefore late bilinguals, participated in the present study. All participants were enrolled in the last year of high school at Instituto Federal de Santa Catarina where the author works. They had studied Spanish in high school besides English, but none of them considered themselves either fluent or proficient Spanish speakers. The thirty-nine participants read out loud a paragraph, answered a habits and beliefs form, and filled in a self-esteem scale. Out of the thirty-nine participants, twenty-nine (fourteen females) completed an attention test.

Data collection

All participants filled in the consent form followed by a beliefs form addressing English pronunciation instruction and English language. Six questions were analyzed in the present study:

1. I consider my English pronunciation (bad, basic, intermediate, advanced, native-like)

2. I like when the teacher corrects my pronunciation (totally disagree, disagree, agree, totally agree)

3. I like explanations about pronunciation (totally disagree, disagree, agree, totally agree)

4. I feel uncomfortable speaking in English (totally disagree, disagree, agree, totally agree)

5. I like English (totally disagree, disagree, agree, totally agree)

6. I consider studying pronunciation – mark as many as you want to (useful, interesting, fun, important, easy, essential, useless, boring, a waste of time, unnecessary, irrelevant, difficult).

Then, participants answered Rosenberg's self-esteem scale (Rosenberg, 1965) in the Brazilian Portuguese version (Hutz et al., 2016). The scale is composed of ten statements and participants had to state to what extent they agreed with each statement.

After answering the surveys, the participants were recorded reading out loud the short paragraph which is the one used in "The Speech Accent Archive" - a database of native and nonnative English speakers from several countries reading out loud the same paragraph (http://accent.gmu.edu/browse_language.php?function=detail&speakerid=145). Participant's pronunciation was, then, analyzed considering a few criteria: vowel epenthesis (Bettoni-Techio, 2005); paragoge and voicing of word-initial /s/-clusters (Bettoni-Techio, 2008; Bettoni, 2022); palatalization of alveolar stops (Bettoni-Techio, 2005); devoicing of final /z/; and, swapping a vowel for a very different one. The recordings were perceptually analyzed by the researcher and an additional judge, and acoustically analyzed using Praat 6.4.01 software with the aid of spectrograms.

Finally, twenty-nine out of the thirty-nine participants (16 female) took the d2-R. d2-R is a German Bourdon-style cancellation test of sustained attention. Some processes that are assessed by the test and contribute to the resulting measure of sustained attention are processing speed, impulsivity, and selective attention. The d2-R test has norms for Brazilians and is an approved test of which the purchase, the use, and the interpretation manual cannot be made available to people without a psychology degree; therefore a few details about the measures and the test had to be omitted. d2 stands for the stimulus to be cancelled and R is for the revised version. The measures considered for the analysis were processing speed, errors of omission, errors of commission, precision, and concentration performance.

The statistical tests run on the data were Spearman non-parametric tests to verify correlations and independent sample *t*-tests to verify whether a specific belief would be partly responsible for performance in pronunciation for different participants. Paired-sample *t*-tests were run when verifying the differences in performance triggered by different conditions/variables the same participant was submitted to.

Results and discussion

Pronunciation of the paragraph reading task

All the thirty-nine participants took the paragraph reading task and were mainly evaluated considering segmental mispronunciations such as vowel epenthesis, paragoge or voicing of word-initial /s/-clusters, palatalization of

alveolar stops, devoicing of final /z/, and swapping a vowel for a very different one. The mean number of mispronunciations was 19.41 whereas the median was 17. There were auditory analysis by two judges and an acoustical analysis by the author. The two participants who produced fewer mispronunciations scored 3 and the one who produced more mispronunciations scored 55. A statistical analysis of the results indicated that 25% of the participants produced fewer than 8 mispronunciations and another 25% of the participants produced over 26 mispronunciations. No comparisons were carried out for the type of mispronunciation because the number of instances that allowed or triggered mispronunciations was not controlled for. However, only one participant accurately produced all final /z/ instances and only one participant accurately produced all word-initial /s/-clusters.

Self-esteem

Participants answered the Rosenberg's self-esteem scale (1965). Results can range from 10 to 40 points. Table 1 shows the results obtained per sex.

Table 1 - *Self-esteem By Sex*

	N	Mean	Std. Deviation	Median	Min – Max	Average Expected*
Female	16	25.00	4.195	25.50	17 – 30	28.00
Male	20	29.15	7.220	29.50	17 – 39	30.00
Total	36	27.31	6.342	27.50	17 – 39	

*Scores obtained from Hutz et al. (2014, p.91) for 16 to 19-year-olds.

A Levene's Test for Equality of Variance turned a significant result (p=.006); thus, the independent *t*-test assuming equality of variance was adopted and resulted in a significant difference (t(34)=-2.037; p=.050) between male self-esteem and female self-esteem with males presenting a higher self-esteem (M=29.15) in comparison to the female participants (M=25.00). This difference is expected for teenagers and young adults. According to the data presented by Hutz et al. (2014), the results obtained in the present study place participants a little under the expected average; however, a few participants scored very low and others very high. The difference between males and females corroborates previous research (e.g., Hutz et al., 2014).

Beliefs and pronunciation

Regarding beliefs, participants were asked to rate their own pronunciation in English considering five categories (bad, basic, intermediate, advanced, native-like). Even though the concept of intelligibility is among teachers and researchers

more relevant considering pronunciation, participants are more familiar with the categories used in the form. Table 2 shows participants' answers by sex.

Table 2 - *Participants' Self-Perception Regarding English Pronunciation By Sex*

	Female		**Male**		**Total**	
	N	%	N	%	N	%
Bad	4	23.5	2	9.09	6	15.4
Basic	7	41.2	10	45.5	17	43.6
Intermediate	5	29.4	7	31.8	12	30.8
Advanced	0	0	3	13.6	3	7.69
Native-Like	1	5.88	0	0	1	2.56
Total	17	100	22	100	39	100

Most participants rated their English pronunciation as either bad or basic (23 – 59%). There were no significant differences between female participants and male ones. Spearman rank order correlations run on the data found a negative, weak to moderate significant correlation between participants' self-perception regarding pronunciation level and mispronunciations which are typical to Brazilian learners of English as an L2 – vowel epenthesis at the end of words (rho=-.326; p=.021); devoicing of final /z/ (rho=-.363; p=.012); vowel swap (rho=-.391; p=.007); mispronunciation of 'th' (rho=-.422; p=.004); and, palatalization of alveolar stops (rho=-.529; p=.000). The only mispronunciation studied which did not correlate with self-perception was word-initial /s/-clusters which according to Bettoni-Techio (2008) and Bettoni (2022) is a persistent mispronunciation for Brazilian Portuguese learners of English as an L2. Considering all segmental errors added up, a moderate negative significant correlation was found between self-perception and the number of mispronunciations (rho=-.453, p=.002). Therefore, the participants who rated themselves lower regarding pronunciation in English were the ones who produced more mispronunciations. A weak positive significant correlation was found for having received instruction on pronunciation and self-perception (rho=.271; p=.048). No significant correlations were found between participants' self-esteem and their pronunciation self-perception (rho=.087; p=.306).

Participants were asked whether they liked English and whether they felt uncomfortable speaking in English. Regarding pronunciation instruction, they were asked whether they liked to be corrected by their teacher, liked to receive explanations, and would like to learn the phonetic symbols. The raw data and frequencies are shown in Table 3.

Table 3 - *Participants' Perceptions About English And Pronunciation Instruction*

	Totally disagree		**Disagree**		**Agree**		**Totally agree**	
	N	%	N	%	N	%	N	%
Like English	0	0	2	5.1	9	23.1	28	71.8
Like correction	0	0	0	0	14	35.9	25	64.1
Like explanation	0	0	1	2.6	10	25.6	28	71.8
Learn phonetic symbols	4	10.3	7	17.9	19	48.7	9	23.1
Feel uncomfortable speaking	12	30.8	18	46.2	5	12.8	4	10.3

Overall, participants reported they like English, like to have explanations on pronunciation, and like to have their pronunciation corrected by their teacher. Nearly a third of the participants are not interested in learning the phonetic symbols. Even though 71.8% of the participants (N=28) would like to learn the phonetic symbols, only 23.1% (N=9) stated they totally agree they would like to learn them.

When analyzing participants' performance reading the Speech Accent Archive paragraph, a few significant correlations were found. There was a negative moderate correlation between liking English and producing vowel epenthesis (rho=-.447; p=.002) and between liking English and swapping vowels (rho=-.277; p=.044). The ones who liked explanations on pronunciation were the ones who mispronounced the 'th' sound less often (rho=-.313; p=.026), who swapped vowels more rarely (rho=-.339; p=.017), and who mispronounced fewer instances of word-initial /s/-clusters (rho=-.404; p=.005).

There were six positive and six negative adjectives (range for each = 0 to 6) for the participants to choose from as many as they wanted to characterize English pronunciation instruction. The mean of positive adjectives chosen was 4.05 (SD=1.213) and of negative was 0.67 (SD=.621). The positive adjective chosen more frequently was 'interesting' (33 – 84.6%) followed by 'useful' (31 – 79.5%). The negative adjective more frequently chosen was 'difficult' (16 – 41%) and it was followed by 'boring' chosen by 6 out of 39 participants (15.4%). A Paired-sample *t*-test run on the number of positive and negative adjectives chosen by each participant resulted in a very significant difference ($t(38)=15.226$; p.000) indicating that participants had significantly more positive feelings towards pronunciation instruction than negative ones. The participants who had any negative feelings towards pronunciation instruction were the ones who mistakenly produced more vowel epenthesis (rho=.270; p=.048) and more palatalization of alveolar stops (rho=.464; p=.001) which are very salient mispronunciations and associated with lower levels of proficiency. No significant differences were found for the other mispronunciations investigated.

Concentrated attention and pronunciation

d2-R was the test administered to investigate attention. The measures it provides are 'processing speed', 'concentration performance', 'precision', 'errors of omission', and 'errors of commission'. The errors of omission varied between zero to 55 per participant with an average of 13.83 and a median of 8 errors per participant. The errors of commission varied between zero to 10 per participant with a mean score of 1.93 and a median of 1 error of commission per participant. The errors of omission reflect selective attention and the errors of commission reflect the inhibitory control. Details about how to reach the scores mentioned cannot be reported due to restrictions from the Federal Psychology Confederation in Brazil. The data of other measures resulting from the d2-R application are displayed on Table 4.

Table 4 - *Main Results From The D2-R Application*

	Concentration Perform.			**Processing Speed**			**Precision**		
	Raw Score	Perc.	Classif.	Raw Score	Perc.	Classif.	Raw Score	Perc.	Classif.
Mean	160.59	82%	High	176.62	82%	High	8.825	50%	Average
Median	158	82%	High	173	82%	High	5.970	67%	Average
Min	116	32%	Low Average	127	25%	Low	0	>99%	Very High
Max	236	>99%	Very high	245	99%	Very High	31.28	10%	Low

The mean and the median scores obtained from the concentration performance of the participants were 160.9 and 158 respectively, indicating that most participants had a better performance regarding concentration than 82% of Brazilians who matched their profile. The participant with the worst performance though, an eighteen-year-old male, scored 116 which means his concentration performance is under average and above 32% of Brazilians with his age and education being classified as low average. He was one of the three participants who were tied up (17 points) having the lowest self-esteem score and produced more mispronunciations than 94.8% of the participants – only two participants had more mispronunciations. The participant with the best concentration performance, another eighteen-year-old male, scored 236 which means his concentration performance was above at least 99% of Brazilians with his profile, being classified as very high. He had an average score of 22 for self-esteem and produced more mispronunciations than 66% of the participants. With 23 mispronunciations, he was classified in the average quartile.

Considering processing speed, the average score obtained was 176.62 and the median was 173. Both scores situate the participants as faster than 82% of people with their profile regarding nationality, age, and education. The lowest score

obtained was 127 in the percentile 25% classified as low and the highest score obtained was 245 in the percentile 99% classified as very high. The participant who was the lowest in processing speed is also one of the two participants who committed fewer mispronunciations (N=3). However, the other participant who committed only 3 mispronunciations had a processing speed score of 186 and was classified as high. The participant with the highest processing speed is also the participant with the highest concentration performance.

Regarding precision, the lower the score the more precise the participant was. The mean score was 8.825 classified as average when compared to other Brazilians with the same age and education. However, the median obtained was 5.970 which is better than 67%. The most precise participant scored zero and was classified as very high whereas the least precise participant scored 31.28, more precise than only 10% of the people with his profile and was classified as low. The most precise participant was an eighteen-year-old female who did not commit any errors and mispronounced fewer instances than 90% of the participants. The least precise participant was an eighteen-year-old male who mispronounced more than 51.28% of the participants.

Spearman Rank Order correlation tests were run on the data obtained by the d2-R and by the paragraph reading task. Table 6 presents correlations per type of error.

Table 6 - *Significant Correlations Between D2-R And Mispronunciations*

	Concentration performance	**Processing speed**	**Errors of omission**	**Errors of commission**	**Precision**
Vowel epenthesis	MODERATE TO STRONG	MODERATE	-	-	-
Word-initial /s/-cluster	-	-	MODERATE	-	MODERATE
Palatalization of alveolar stops	WEAK	-	MODERATE	-	MODERATE
Final /z/ devoicing	-	-	-	MODERATE	-
Vowel swap	-	-	-	WEAK	WEAK
th grapheme	-	-	WEAK	-	MODERATE
All segmental errors	-	-	WEAK	MODERATE	MODERATE

For concentration performance, a moderate to strong significant correlation was found with production of epenthesis at the end of words (rho=-.548; p=.001) and a weak one for palatalization of alveolar stops (rho=-.337; p=.037). Both types of mispronunciation are, as previously stated, very salient and present at lower levels of proficiency. Considering processing speed the only significant

correlation found was a negative moderate correlation with production of epenthesis at the end of words (rho=-.417; p=.012).

The 'errors of omission', on the other hand, correlated moderately with palatalization (rho=.409; p=.014), weakly with mispronunciation of the 'th' grapheme (rho=.372; p=.023), and moderately with mispronunciation of word-initial /s/-clusters (rho=.431; p=.010). 'Errors of omission' are considered to measure selective attention, therefore, they correspond to failure in selecting the appropriate stimuli. 'Errors of commission' correlated moderately with devoicing of final /z/ (rho=.484, p=.004), and weakly with vowel swap (rho=.339; p=.036). 'Errors of commission' measure inhibitory control, that is, impulsivity. A possible explanation for the correlation of 'commission errors' and 'vowel swap' is that participants who exchange sounds completely may do it by impulse, for not being able to inhibit the will of reading fast and rushing to end the task even unconsciously. As regards the devoicing of final /z/, it is a common mispronunciation of Brazilian speakers due to the different voicing rules between Brazilian Portuguese and English.

The 'precision' which represents the care when performing the test correlated weakly with vowel swap (rho=.343; p=.034) and moderately with palatalization (rho=.505; p=.003), with mispronunciation of 'th' grapheme (rho=.454; p=.007), and with mispronunciation of word-initial /s/-clusters (rho=.403; p=.015). Lack of' 'precision' implies lack of care during the d2-R test and the same lack of care seems to happen when performing other tasks such as reading a paragraph in English or, possibly, when listening to acoustic features of spoken English or pronunciation instruction delivered by a teacher.

Considering all the segmental mispronunciations added up, negative moderate significant correlations were found for 'precision' (rho=.417; p=.012), and for 'errors of commission' (rho=.493; p=.003). Negative weak significant correlations were found for 'errors of omission' (rho=.317; p=.047). Carelessness, impulsivity, and flaws in selective attention seem to be important regarding accurate pronunciation when reading a paragraph in English for the participants of the present study. However, when salient errors such as mistaken vowel epenthesis at the end of words and mistaken palatalization of alveolar stops happen, it seems concentration and processing speed come into play.

Conclusion

As it happens for English proficiency level in general, accuracy regarding pronunciation in English tends to vary greatly among Brazilian high school students. Participants produced from 3 to 55 segmental mispronunciations reading the sixty-nine-word-paragraph with a median of 17. While 25% of the participants produced fewer than 8 mispronunciations, 25% produced over 26 mispronunciations. This variation, among many other explanations, can be assigned to the quality and quantity of previous exposure to English. In this exploratory study, we wanted to investigate whether some of this variation could also be attributed to learners'

beliefs, self-esteem, and attention considering our view that variables do not act in isolation and each variable affects the others and is affected by them as a dynamic system. This view helps us understand the world, the people, and the L2 learning process. Our intention was to contribute to the investigation on sustained attention, self-esteem, and beliefs about L2 pronunciation and instruction interaction with L2 pronunciation in a reading task.

In the process of doing so, we found that the female participants had lower self-esteem when compared to the male participants. Also, their self-esteem as a group was a little lower than expected based on previous literature. However, their self-esteem correlated neither with the number of mispronunciations produced nor with their pronunciation self-perception. Nevertheless, the participant with the lowest self-esteem score was the one who obtained the lowest concentration score and was better in the pronunciation task than only around 5% of the participants. Most participants perceived themselves as having basic or a lower level of pronunciation in English. A moderate negative significant correlation indicated that participants who rated themselves lower regarding pronunciation in English were the ones who produced more mispronunciations. Also, those who received instruction have better self-perception. Most participants stated they like English, like explanations about pronunciation, and like to be corrected by the teacher. Even though most participants (N=28) would like to learn the phonetics alphabet, eleven disagreed.

There were significant correlations between liking English and liking explanations on pronunciation and the number of mispronunciations suggesting the important role of interest in L2 experience. Around 80% of the participants find English pronunciation instruction interesting and useful, 41% find it difficult and only 15.4% find it boring (N= 6). A significant difference ($t(38)=15.226$; p=.000) was found indicating that participants had more positive feelings towards pronunciation instruction than negative ones. Also, having negative feelings towards pronunciation instruction was significantly associated with vowel epenthesis and palatalization of alveolar stops which are very salient mispronunciations frequent at lower levels of proficiency.

Finally, the test of attention administered yielded measures of concentration, processing speed, selective attention, impulsivity, and care. Carelessness, impulsivity, and flaws in selective attention seem to be very important regarding accurate pronunciation when reading a paragraph in English for the participants of the present study in that the measures obtained correlated significantly with mispronunciations in general. The lack of care present in test taking and precision score which correlated with four types of mispronunciation individually may also be present in daily life when listening to English and when attending classes. Selective attention and precision correlated significantly even with mispronunciations of the word-initial /s/-clusters which are very persistent errors even for advanced learners. However, when salient errors such as mistaken vowel epenthesis at the end of words and mistaken palatalization of alveolar stops happen, it seems concentration and processing speed come into play.

Some pedagogical implications taken from this research are that learners' interest is essential for satisfactory development in English and that teachers need to take learners' individual differences into account when designing materials, planning, and delivering lessons. Most learners like to be corrected and to receive explanations about pronunciation. Phonetic symbols, on the other hand, must be taught with caution to prevent learners from losing interest and getting distracted.

New research questions arise from this exploratory study and its limitations. First, pronunciation needs to be assessed with more natural tasks and attention could be assessed with an auditory attention instrument. Future research should also investigate the interaction among other individual differences considering onset age of learning, learning context, quality of exposure, L1 and L2 combinations, beliefs, intelligibility, cognitive and affective aspects. Also, other skills as well as language proficiency in general need to be considered in cross-sectional and longitudinal research.

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Recebido em: 26/02/2024
Aceito em: 15/10/2024