

Awareness of Segments and Phonological Processes in College Students: Some Results and Educational Implications

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1. Introduction

•Previous research on phonological awareness (PA) in native language

•**Concept and levels of language awareness** >> different schemes for describing the levels and manifestations of language awareness (see e.g. [1], [2], [3]).

•**Syllabic and segmental awareness** >> data mainly on performance of adults vs. preschoolers, beginning learners of reading and writing, non-alphabetised adults (see [4]); alphabetised students master these abilities; however, some evidence does not support this (see [5], [6], [7]); few studies on the influence of phonological properties (e.g. natural class of the segments, phonological processes) on PA.

•**Awareness of phonological processes** >> data mainly on stress assignment (e.g. [8]).

•**Orthographic knowledge and PA** >> orthography may interfere in PA performance in European Portuguese (EP) (see e.g. [9], [10]).

•**Our goal:** To evaluate the awareness of non-consonantal segments and of 3 phonological processes, shown by some College students who are native speakers of standard European Portuguese (EP).

2. Method

•**Participants:** 10 students from the 1st year of College (5 male and 5 female), native speakers of standard EP that had no knowledge in Phonetics or Phonology, ranging in age from 18 years to 21 years (average age 18.8 years).

•**Procedures:** Software *E-Prime 2.0* used to present the stimuli and to record the subjects' responses.

Tasks	Phonological processes	Words' format (6 words per condition)
1. Deactivation of phonological process originating a word	Nasalization (see [11])	CV.CV
2. Deactivation of phonological process originating a pseudoword	Nasalization Vowel reduction (see [11])	CV.CV CV.CV.CV
3a. Identification of segmental contrast in the 1 st syllable and 3b. explanation of the contrast's 'cause'	Nasalization Vowel reduction V1 Semivocalization (see [12])	CV.CV / CV.CV CV.CV / CV.CV.CV CV.V.CV / CGV.CV

Example of task 1: deactivation of nasalization in *linda* ['lĩdɐ], 'beautiful_{FEM}', gives rise to *lida* ['lidɐ], 'read_{PAST-PART_FEM}'.

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3. Results: description and discussion

•Segmental awareness

		Raw no. correct responses	% correct responses
3a. Identification of segmental contrast in the 1 st syllable	Nasalization	44/60	73%
	Vowel reduction	40/60	67%
	V1 Semivocalization	14/60	23%
	Total	98/180	54%

•Results show an **intermediate level of segmental awareness** (success rate: 23%-73%).

•There is **some influence of orthography**: 32% of the incorrect responses refer to the letters' names.

•**Success rate in Nasalization and in Vowel Reduction** does not present a significant difference (binomial test: test proportion for Vowel Reduction = .73, ns). There are orthographic clues to identify the nasal vowel but no clues for distinguishing the reduced and the unreduced vowel.

•**Success rate in V1 Semivocalization** is significantly different from both Nasalization and Vowel Reduction (binomial test: test proportion for V1 Semivocalization = .73, $p < .05$; = .67, $p < .05$). This may be due either to the influence of lexical knowledge (presence of contrast between the same words reduces the success rate) or to the influence of phonological processes (more difficulties to identify the segmental contrast when the V1 Semivocalization process is involved).

•Awareness of phonological processes

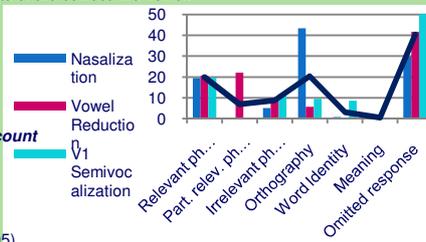
		Raw no. correct responses	% correct responses
1. Deactivation of phonological process originating a word	Nasalization	59/60	98%
	Total	59/60	98%
	Nasalization	56/60	93%
2. Deactivation of phonological process originating a pseudoword	Vowel reduction	27/60	45%
	Total	83/120	69%

•The **type of string (word or pseudoword) resulting from the deactivation of a phonological process does not influence the success rate**: deactivation of nasalization originating a word (task 1) does not differ significantly from deactivation of nasalization originating a pseudoword (task 2) (binomial test: test proportion for deactivation of nasalization originating a word = .93, ns).

•Results show **some influence of orthography**:

-higher success rate in Nasalization (probably due to the orthographic clue of taking out the <n>);
 -61% of the incorrect responses in Vowel Reduction consisted in replacing the reduced high vowel for a low one (which coincides with the name of the corresponding letter), instead of the correct mid vowel.

		Mean
3b. Explanation of the contrast's 'cause'	Nasalization (N=60)	5%
	Vowel Reduction (N=60)	11%
	V1 Semivocalization V1 (N=60)	11%
	Total (N=180)	9%



•Results in 3b show a **low level of ability to explicitly account for the phonological processes**; this contrasts with the level of segmental awareness exhibited when subjects are faced with a segmental contrast (3a).

•**Mean of points in Vowel Reduction** differs significantly from the mean in Nasalization ($U = 691.00$, $z = -3.52$, $p < .05$) but not from the mean in V1 Semivocalization ($U = 877.00$, $z = -1.36$, ns).

•Responses given by the subjects (see graphic) show both **the influence of orthography and the sensibility to phonological processes**: many answers refer to orthography, especially in Nasalization (the only process related to orthographic clues); V1 Semivocalization presents the higher percentage of omitted responses, of references to irrelevant phonological processes, and of references to word identity.

•Results in task 3a/b present the same trends observed in [7], although subjects and method are different.

4. Conclusions and Educational Implications

The higher success rate in identifying the segmental contrast (than in explicitly accounting for the contrast's 'cause') gives empirical support for:

- the distinction of different levels of PA;
- the consideration (along with Titone, among others) that the development of the ability to describe the language properties demands formal instruction.

The intermediate level of segmental awareness and the interferences of orthographic knowledge in performance (related to the awareness of segments and of phonological processes) reveal that:

- the Portuguese College students did not completely master the segmental awareness ability (even though they have successfully concluded the alphabetization process), which contrasts with the generalized assumption in the literature;
- the means being used to solve the PA tasks is probably orthography and not phonological representations.

Therefore...

- the different levels of PA should be promoted in native language classes also during the middle and secondary schooling, since PA corresponds to a knowledge independent from the orthographical one;
- in PA training, concrete symbols should be used to represent the abstract units (and reduce the interference of letters and orthography).

The influence of phonological processes in PA performance is frequently associated with the interference of orthographic knowledge. Therefore, future research must find ways of controlling this variable.