A variationist investigation of vowel sequences: The raising of /e/ and /o/ in Spanish
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Studies of phonological variation in Spanish have showed that consonantal variation tend to be the norm in all varieties of the language or one could say that at least many scholars have paid more attention to consonantal variation than vowel variation in Spanish (e.g. Cedergren 1973, Fontanella de Weinberg 1978, Poplack 1980, Lafford 1986, Rissel 1989, among many others). Syllable-final /s/ aspiration and deletion, in fact, has been one of the consonantal variables that scholars have dedicated a great number of papers (Terrel 1979, Poplack 1980, Lafford 1986, Ruiz-Sanchez 2004, File-Muriel 2007, Brown 2009, etc). On the contrary, vowel variation has received little attention, but recent work by Scrivner (2011), Delforge (2008, 2010), Alba (2006) and others has begun to fill this gap in the literature. The present investigation contributes to the field by examining the raising of /e/ and /o/ in vowels sequences word internally using the tools of variationist sociolinguistics. Vowel raising has consequences on the syllabification of the sequence because after raising the two vowels in hiatus become a diphthong. While previous phonological analyses of diphthongization were mainly based on laboratory speech, this study examines spontaneous speech. In addition, several linguistic and extralinguistic factors were examined in this analysis including lexical frequency and type frequency to determine the effect they have on vowel raising and diphthongization in Spanish.

For this study, thirty six speakers were selected from the corpus Estudio Sociolinguístico del Habla de Caracas (1987); (see Bentivoglio and Sedano 1993) and divided according to: socioeconomic level (upper class, middle class, and working class), age (14-29, 30-45, and 61 and older), and gender (male and female). All instances of vowel sequences consisting of /ae/ (maestro ‘teacher’), /ao/ (caos ‘chaos’), /oa/ (toalla ‘towel’), /oe/ (poeta ‘poet’), /eo/ (rodeo ‘rodeo’), and /ea/ (real ‘real’) were extracted. An acoustical analysis of the tokens was performed by measuring F1 and F2 to classify variants. The tokens were further normalized in order to eliminate physiological differences between men and women. The normalized data were plotted in the acoustic software Plotnik10 (Labov, 2001) and compared with the formant mean values reported in Scrivner (2011). The tokens were coded according to the following independent variables: 1) manner of articulation of the previous segment, 2) point of articulation of the previous segment, 3) grammatical category, 4) quality of the second vowel, 5) duration of the target vowel, 6) token frequency, 7) type frequency, 8) Stress, 9) number of syllables, 10) age, 11) gender, and 12) socioeconomic class. The first part of the analysis focuses on presenting a general description of the acoustical characteristics of the variants involved in these vowel sequences. The second part of the study examines the contribution of linguistic and extra linguistic factors in predicting vowel raising.

The results of the present analysis are based on 605 tokens. The linguistic factors conditioning vowel raising and diphthongization according to the quantitative results from Rbrul (Johnson, 2008) are: the quality of the second vowel, stress, and number of syllables. Vowel raising and diphthongization is more common in sequences where the second vowel is low with a weight of 0.592. We also found that raising and diphthongization is more common in unstressed syllables (0.679) as well as monosyllabic and disyllabic words (0.752). The measures of frequency taken demonstrate that lexical frequency and type frequency are important in predicting vowel raising and diphthongization. High frequency items and the most frequent sequences composed of /ea/ strongly favor raising and diphthongization. The pattern of variation found shows how usage conditions vowel raising and diphthongization favoring the phenomenon in monosyllabic and disyllabic units, high frequency words, and high frequency sequences in unstressed vowels. As far as the sociolinguistic factors are concerned males and middle and lower socioeconomic class speakers favor the phenomenon. The findings of this investigation contribute to fill a gap in understanding vowel variability in Spanish as well as providing evidence of the role of usage in shaping phonological variation and change (Bybee 2003).