This study examines the pronunciation of the mid-vowels /e/ and /o/ in Heritage Spanish, offering insight into the acoustic distribution of these vowels along the front-back (F2) continuum based on syllable type and speech style. Studies of monolingual Spanish mid-vowels have argued for height differences based on syllable type (Navarro-Tomás, 1917; Quilis & Esgueva, 1983; Martínez-Celdrán, 1995), the presence of mid-vowel raising and deletion in vocalic sequences (Alba, 2006; Hualde, Simonet, & Torreira, 2008), and described mid-vowel raising in different geographic regions and social groups (Hualde, 1989; Parodi & Santa Ana, 1997; Oliver, 2007). With respect to speech style, Harmegnies & Poch-Olivé (1992) and Willis (2005) found that vowels produced in spontaneous speech styles were centralized, showing differences in height and backness when compared to vowels produced in more controlled speech. With the exception of Morrison (2004), however, examinations of the Spanish mid-vowels and the effects of syllable type have typically focused on vowel height and not backness. That only two studies directly assess the effects of speech style on vowel production suggests the need for further investigation. The current project introduces a new perspective on Spanish mid-vowel pronunciation by analyzing variation along the front-back continuum with respect to a central point in the acoustic space. Heritage speakers (“early bilinguals”) are the population under investigation in this study. As bilinguals are argued to exhibit modified systems of pronunciation that differ from the pre-established monolingual norms within the same dialect region (Konopka & Pierrehumbert, 2008; Menke, 2010; O’Rourke, 2010; Roeder, In Press), this study will also offer insight into how this particular group of bilingual speakers organizes their vowel space.

Five female Heritage Speakers of Spanish from the Chicago area completed a semi-spontaneous speech task (picture description) and a controlled speech task (carrier phrase), producing approximately 150 total vowels, 20 to 30 of which consisted of tokens of /e/ and /o/. The first and second formant frequencies of each vowel were measured at the midpoint using an automated procedure in Praat software (Boersma & Weenink, 2011). The overall vowel space and centroid for each speaker and each task was calculated using a method similar to the S-centroid procedure (Watt & Fabricius, 2002), in which the center of the vowel space is calculated based on the F1 and F2 values of /i, a, u/. The distance along the F2 dimension of the mid-vowels from the centroid was calculated in order to examine their distribution with respect to the center point.

Preliminary analyses reveal that mid-vowels produced in the controlled speech task are farther from the centroid than those produced in the semi-spontaneous speech task, and that /e/ is produced closer to the centroid than /o/. These findings are consistent with Harmegnies and Poch-Olivé (1992) and Willis (2005) pertaining to centralization in spontaneous speech, and also demonstrate asymmetry similar to that reported by Willis (2005) and O’Rourke (2010). Additionally, vowels in closed syllables are produced farther back in the vowel space in the semi-spontaneous speech task when compared to their open counterparts, but the opposite trend is observed in controlled speech (See figures 1 and 2 below). Taken together, these findings broaden our understanding of the Spanish vowel system, and characterize the patterns of production observed in HS Spanish. This investigation is an important first step in describing the HS vowel system, understanding how different linguistic and stylistic factors affect production, and provides a basis for comparison to other monolingual and bilingual varieties.
Figures

**Figure 1.** Mid-vowel distribution for speaker HSF5 in the semi-spontaneous speech task. The circles denote average values for /e/, the squares for /o/. The black markers denote vowels produced in open syllables and the grey markers represent vowels produced in closed syllables. The “x” is the centroid value calculated based on the point vowels /i,a,u/ produced by this speaker in this task.

**Figure 2.** Mid-vowel distribution for speaker HSF5 in the controlled speech task. The circles denote average values for /e/, the squares for /o/. The black markers denote vowels produced in open syllables and the grey markers represent vowels produced in closed syllables. The “x” is the centroid value calculated based on the point vowels /i,a,u/ produced by this speaker in this task.

References


