

# MEN, WOMEN AND LENITION: GENDER DIFFERENCES IN THE PRODUCTION OF INTERVOCALIC VOICED STOPS IN MEXICAN SPANISH

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## 1. INTRODUCTION

Recent experimental studies suggest that the lenition of Spanish voiced and voiceless stops is a variable process influenced by phonetic factors including prosodic and segmental context [3, 6, 7]. Phonological factors may also play a role. Specifically, it has been suggested that inventory constraints may inhibit the degree of lenition in order to maintain a segmental or class contrast [7]. Other studies have suggested that dialectal differences may also influence lenition and that Spanish varieties do not lenite stops to the same degree. [2, 6]. Thus, a complete account of the lenition patterns for Spanish stops requires the investigation of extralinguistic factors (like dialect) along with phonological and phonetic factors. In studies on other Romance varieties, an additional extralinguistic factor found to influence lenition of intervocalic consonants is gender. In a study of lenition of intervocalic voiced and voiceless stops in Florentine Italian, Villafaña Dalcher [9] found “a much higher incidence of lenition in the female subjects” (p. 157). However, the influence of gender has not been experimentally investigated for Spanish varieties. With the objective of addressing this experimental gap, the present study explores the effects of gender in the realization of intervocalic /b d g/ in Mexican Spanish. We test the hypothesis that significant gender differences exist in the degrees of lenition of these consonants. In a departure from the above studies, the data examined here come from interviews designed to elicit conversational speech.

## 2. METHOD

### 2.1 Data Collection

To test the above hypothesis data were collected from a total of six native speakers (three males and three females) of a similar variety of Mexican Spanish (Mexico City and nearby areas). The speakers ranged in age from early-20s to late-40s. Data come from hour-long interviews during which speakers performed the following: (i) a picture identification task and (ii) a story-telling task where speakers were given three sets of sequential pictures and asked to relate the events in each set. These tasks were designed to elicit a casual, conversational speech style. To this end, in the picture identification task, the picture itself did not represent the target word but rather served to introduce questions meant to elicit the target word embedded in a longer stretch of speech, rather than as a single, carefully articulated word. The participants were recorded with a Marantz CDR300 CD recorder and an

AudioTechnica unidirectional condenser microphone in a quiet room (Multimedia Lab, Carr Hall, University of Toronto). The recorded files were then downsampled (22050 Hz, 16 bits) and low-pass filtered to remove frequencies over 11,000Hz.

### 2.2 Measurement and Analysis

In total, 426 tokens were analyzed (235 for the female speakers and 191 for the male speakers) using Praat 4.4.26. The acoustic parameters used as measures of lenition were duration and speed of consonant release.

Duration has been identified as a very robust indicator of lenition [5, 6, 9] with shorter segments considered more lenited. First, the absolute duration in milliseconds of the intervocalic was taken for each token. The beginning of the intervocalic C was taken to be the point at which there was a rapid drop in intensity and a decreased formant structure from V-to-C and the end of the C was taken to be the point where a rapid increase in intensity as well as a clearer formant structure were apparent, thus signaling the start of the second V. Then, to compensate for possible inter- and intra-speaker variation in speech rate, the absolute duration of the intervocalic consonant was normalized as a proportion of the total duration of the VCV sequence [9]. It is these normalized durations which are reflected in the analysis.

Speed of consonant release is a measure of the difference in intensity between a C and a following V over time. It is measured in decibels per second (dB/s) [7]. A smaller number reflects a lower speed of consonant release and a more lenited, more vowel-like production.

Tokens with no discernible difference in intensity and/or formant structure in the VCV transition or which had a consonant release of less than 1dB/s were deemed cases of deletion and were not included in t analyses. Also not included were cases of intervocalic /d/ which were part of a past participle, *-ado* or *-ido*. The purpose of this omission was to avoid inflating the rate of intervocalic /d/ lenition since /d/ appearing in the context of past participles (especially *-ado*) is subject to morphological as well as phonetic conditioning [1].

Results were evaluated using repeated-measures ANOVAs with the statistical software SPSS 16, with *p* level set at .05.

### 3. RESULTS

#### 3.1 Duration

Figure 1 shows the results for the relative duration of intervocalic /b d g/. The values reflect a RM-ANOVA with *consonant* as the within-subject factor and *gender* as the between-subject factor. The male speakers exhibit a shorter duration for all three places of articulation and thus appear to lenite more. However, this difference is not large enough to be statistically significant. On average, the relative duration of the female speakers' consonants was approximately 23.5% compared to 21.8% for the male speakers.

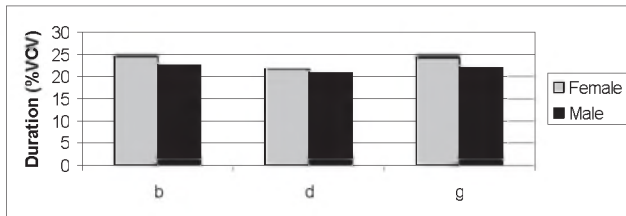


Figure 1. Relative duration of intervocalic /b d g/ in Female and Male Mexican Spanish speakers

#### 3.2 Speed of Consonant Release

The results for speed of consonant release are given in Figure 2. The values again reflect a RM-ANOVA with *consonant* as the within-subject factor and *gender* as the between-subject factor. On this measure we find that males have a lower speed of consonant release across all places of articulation. Here the difference appears greater than with duration, with the female speakers averaging a speed of consonant release of 13.4 dB/s compared to 8.1 dB/s for the male speakers. However, as above, this observed difference does not reach statistical significance.

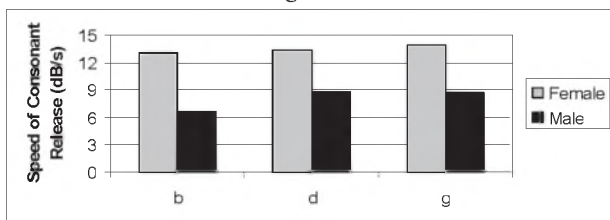


Figure 2. Speed of consonant release of intervocalic /b d g/ in Female and Male Mexican Spanish speakers

### 4. DISCUSSION

Results show that on both measures the Mexican Spanish males lenite more. This is reflected in a shorter duration and in a slower speed of consonant release in the consonants produced by the male speakers, across all places of articulation. Despite this observed trend, our hypothesis is not supported since the effects of gender on lenition of intervocalic /b d g/ did not reach statistical significance. However, preliminary results from four speakers of Argentine Spanish (two males, two females) show the same tendency. Figure 3 shows that their results for speed of consonant release mirror those obtained for the Mexican

speakers. Thus, a future direction for this study is to analyze more speakers across different dialects to determine whether gender is indeed a significant influence on lenition.

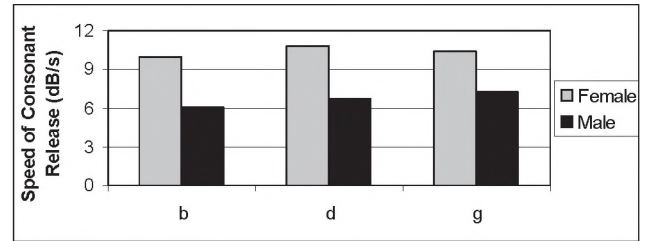


Figure 3. Speed of consonant release of intervocalic /b d g/ in Female and Male Argentine Spanish speakers

Our results also appear to contradict Villafaña Dalcher [9] who found that in Florentine Italian female speakers lenite more. However, we argue that in both cases the results reflect the tendency for females to prefer formal and/or prestige speech variants of stable linguistic variables [4]. Thus, the Florentine Italian female speakers may adopt higher levels of lenition because this lenition is a positive social marker, associated with the Florentine identity [9]. In the case of Spanish varieties, the opposite trend is expected since lenition, while not necessarily a negative social marker, may be associated with a less formal way of speaking [8].

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