2-13-1986

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SEX DIFFERENCES IN MEXICAN ADOLESCENTS' SPEECH:
AN ANALYSIS OF
SPEECH RATE AND HESITATION PHENOMENA

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ABSTRACT

Twenty monolingual Spanish speaking adolescents, 10 males and 10 females, were asked to produce a narrative based on their own arrangement of a set of nine pictures. Stories based on these pictures yielded statistically significant differences between males and females in problem solving time, in speech rate, in total length of story measured in syllables, in the length of disruptive vocal hesitation, and in the length of total vocal hesitations. Results are discussed with reference to other research on speech rate and hesitation phenomena and to other studies of male/female linguistic differences. Sociocultural and psycholinguistic explanations are offered to account for the statistically significant differences found in this sample of Mexican adolescents.
INTRODUCTION

Differences in speech patterns and language behavior can be studied from many points of view, such as phonologic, syntactic, psycholinguistic, and sociolinguistic. While it is a truism to say that social factors in a person's environment influence the learning and usage of a language, it is also true that within each society language conventions such as accent and style are many and varied. Sociocultural expectations result in different registers used by specific groups within that society (Labov, 1971). Studies of differences in male and female language behavior have emphasized sociocultural variables such as social class (Edwards, 1979), interactive communication (Berko-Gleason, 1975), and cultural constraints in sex roles (Edelsky, 1976). These and many other studies establish the existence of certain differences in the way men and women speak and in the way they are perceived by others. Another area of sociolinguistic research has established the existence of stereotypes in male and female speech. Stereotypes that are transmitted across generations as a component of accumulated knowledge thus are true in some sense (Kramer, 1975; Erlich, 1973).

Our research studied the narratives produced by 20 Mexican adolescents in terms of speech rate and hesitation phenomena. This research is based on the conviction that the temporal and hesitation properties of speech yield lawful results that are essential to a viable explanation of speech behavior. The importance of the study of speech rate, pauses and hesitation phenomena is pointed out by Kowal, O'Connell, O'Brien and Bryant (1975): "The cumulative evidence indicates that an adequate theory of speech behavior must take into account temporal aspects of speech, must cope with the multiple determination of dependent variables, and must at once be both cognitive and linguistic " (p. 20).

The study of temporal parameters and vocal hesitations in spontaneous speech offers a more complete understanding of the speaker's behavior: one which reflects both the cognitive and the linguistic processes occurring at the moment of speech production. This approach provides additional insight needed for a complete understanding of the semantic and syntactic structures found in the produced discourse. The basic premise of this approach is that pauses (silent and filled) and vocal hesitations (parenthetical remarks, repeats and false starts) are lawful phenomena and reflect communicative functions.

Developmental studies by O'Connell and associates have reported developmental data from age six to sixty (Sabin, Clemmer, O'Connell, and Kowal, 1979). Sex differences were not found in most of these developmental studies. Kowal, O'Connell, and Sabin (1975) state: "The expected differences between age and sex for temporal patterning was not found. Instead, sex has a main effect on only one response, length of silent pauses: boys produced longer silent pauses than girls at all age levels, except eighth graders" (p. 202).

Much of the work in linguistics in the Spanish language has been done in applied linguistics, as witnessed by the numerous books and articles on pedagogical matters. Paralinguistic research on speech rate and hesitation
phenomena is extremely limited. Levine (1971) stated that improved pronunciation is indicated by a decrease or lack of hesitations. Leeson (1970) explored the nature and types of pausing and their possible application in second language teaching and performance evaluation. Johnson, O'Connell, and Sabin (1979) found certain commonalities and language specific differences in the use of hesitations in a study of narratives produced by Spanish and English speaking adolescents.

The following hypothesis was studied in the present research: The speech rate and hesitation phenomena of male and female adolescents will reflect the culturally defined sex roles of their society.

**METHOD**

**Subjects**
Speech samples were collected in San Luis Potosi, Mexico from 10 male and 10 female adolescents. The males' average age was 15 years and 8 months; the average age for the females was 16 years and 1 month. The subjects attended sex-segregated private, college preparatory schools. All the subjects were native Spanish speakers, from monolingual homes of similar, upper middle class, socioeconomic backgrounds. The adolescents' academic achievements were comparable. None of the subjects had diagnosed speech or learning disabilities.

**Stimulus Materials**
The subjects were requested to tell a story based on nine pictures which formed a cartoon. Printed dialogue between the characters did not appear in the set of pictures. The cartoon sequence consisted of a girl, a dog, and a balloon drawn in black and white on 2 1/2 x 3 inch cards enclosed in clear plastic. This set of stimulus cards (used in other research, e.g., Sabin et al) permitted several probable sequences of action and the speaker was able to choose the level of interpretation which he/she felt was adequate.

**Procedure**
Subjects performed the task individually in the presence of the experimenter in a quiet room. Each subject was presented with a standard scrambled display of the nine pictures. The subject was instructed to arrange the nine pictures into a single row that made a sensible story and then to tell the story out loud to the experimenter.

A Wollensak reel to reel tape recorder Model 3500 was used to record and analyze the subjects' speech. A microphone was placed on the table directly in front of the subject to ensure high quality recordings. Recordings were made at 3 3/4 inches per second on professional quality recording tape.

Verbatim transcripts of the narratives were prepared from the cassette tapes and verified by an independent transcriber; any differences were reconciled by recourse to the judgement of a third person.
Response Measures
Picture arrangement time and total story telling time were measured from the audio recordings to the nearest second. Story length was measured as the total syllables used to relate the story. Speech rate (syllables per second) was defined as story length divided by total speaking time.

Four types of vocal hesitations were studied: filled pauses, repeats, false starts and parenthetical remarks. These were defined consistently with prior research conducted by the authors, with appropriate modifications for Spanish. Filled pauses were identified as uh, mm. Repeats were defined as repetitions of any length that were semantically non-significant. False starts included the correction of a noun phrase, or the correction of a word, or an incomplete utterance. Parenthetical remarks were generically defined as words which functioned primarily as verbal fillers rather than content carriers; for instance, in English: Well, you know. The most common Spanish parenthetical remarks were este, pues, entonces, entonces, and bueno (this, well, then and good).

The frequency of occurrence and length of disruptive vocal hesitations, including filled pauses, repeats, and false starts adjusted per 100 syllables was determined. The frequency of occurrence and length in syllable of total vocal hesitations, which included parenthetical remarks, filled pauses, repeats, and false starts was also analyzed.

RESULTS
Eight response measures were individually subjected to one-way analysis of variance to determine statistically significant differences due to sex of the speaker. Table 1 presents the means, standard deviations, and results of the one-way analysis of variance for the five significant speech measures. Specifically, females took a significantly longer time than the males to arrange the pictures into a story sequence. The females told longer stories than the males in total syllables. The females spoke faster than males when telling the story. The females produced a greater length of disruptive vocal hesitations including such devices as filled pauses, repeats, and false starts. In addition, the females produced a significantly greater length of parenthetical remarks and disruptive vocal hesitation syllables combined.

DISCUSSION
The limited sociolinguistic data available in Spanish makes a comparison of these results difficult, but given the original hypothesis that more marked sex differences would be found in a culture with more clearly defined sex roles, reference is made here to studies that show the influence of cultural factors in linguistic and non-linguistic behavior, and how linguistic differences are less pronounced in English-speaking persons. Mary Ritchie Key (1975) states that no linguistic study has ever indicated basic differences in male/female intonation patterns in English, which are exclusively one or the other, as for example, one might find in vocabulary differences. Menyuk (1977) usually
### Table 1

**Sex Differences in Mexican Adolescents’ Speech**

Means (\( \bar{X} \)), Standard Deviations (SD) and Results of One-Way Analysis of Variance for Significant Speech Measures

<table>
<thead>
<tr>
<th>Speech Measure</th>
<th>Male (N=10)</th>
<th>Female (N=10)</th>
<th>F Ratio (df=1, 18)</th>
<th>Probability Level p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Picture Arrangement Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Seconds)</td>
<td>( \bar{X} ) 68.50</td>
<td>132.90</td>
<td>11.04</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>SD 35.61</td>
<td>49.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Story Length</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Syllables)</td>
<td>( \bar{X} ) 91.20</td>
<td>151.60</td>
<td>16.95</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>SD 34.71</td>
<td>30.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Speech Rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Syllables/Second)</td>
<td>( \bar{X} ) 3.71</td>
<td>4.96</td>
<td>9.74</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>SD 0.87</td>
<td>0.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Disruptive Vocal Hesitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Syllables/100 SYL)</td>
<td>( \bar{X} ) 0.33</td>
<td>0.57</td>
<td>5.49</td>
<td>.029</td>
</tr>
<tr>
<td></td>
<td>SD 0.16</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Total Vocal Hesitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Syllables/100 SYL)</td>
<td>( \bar{X} ) 0.35</td>
<td>0.85</td>
<td>12.26</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td>SD 0.19</td>
<td>0.41</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
refers to infants, children, or adults, without reference to sex (gender) in discussing developmental patterns. She does remark, however, that "many factors may play a role in the development of communicative competence. For example, the primary source of interaction at differing periods of development and expectations within the community for the speech behavior of children."

Speaking of the father's influence on children's language, Berko-Gleason states (1975) that fathers are frequently cast into the role of disciplinarian, their language contains more direct imperatives, and that they use more imperatives when speaking with their sons than with their daughters. This heavy use of imperatives to the boys gives the impression that in our society males become accustomed early on to take orders, and, that if it is true that their fathers provide role models, for giving them.

In her study of a Spanish village, Harding (1975) found that in child rearing, the words of women serve cultural ends. It is women who are responsible for their children acquiring language and for their primary cultural formation—their preliminary role instruction—through language; in particular, for their cultural differentiation as girls and boys who will grow into women and men: A mother may speak equally to her children, but she says different things to them according to sex. Harding also found that verbal skills and speech genres are framed for women by cultural and social structures that exist. A woman develops the skills in acting out the structures and the role dictated by them; the skills are first of all essential to, integrated with, or an extension of the tasks and obligations as a wife and mother.

Stereotypes provide further evidence of observed differences, indicating that a culture with more defined sex roles gives rise to more differentiated linguistic behaviors. Williams, Giles, and Edwards (1977) found that, in the learning of sex-trait stereotypes, children as young as five years of age may be quite aware of socially determined stereotypes concerning characteristics of men and women. Kramarae (1980) concludes that "information from the sociolinguistic studies, combined with research findings on stereotypes, indicate that in some cases women and men speak somewhat differently (but not in such extreme variation and not always in the same patterns as the stereotypes would have it), that there are appropriate things to say and ways to say them in interactions (and that these differ somewhat for women and men)."

Thus available research indicates a strong influence of what is learned as proper behavior, both the way the individual sees this and what is perceived as expected correct behavior. Edelsky (1976) states in her discussion of the acquisition of communicative competence and recognition of linguistic correlates of sex roles: "One aspect of communicative competence, that of the recognition of linguistic correlates of sex roles, appears then to be acquired according to two patterns; one of gradual and steadily increasing approximation to adult norms and one of rule learning, then rule overgeneralization, and later, one of differentiation rules. Unlike the acquisition of syntax and phonology, this kind of language acquisition has barely started at the entrance of school and shows its most substantial development during the later childhood years" (p. 58). Eakins and Eakins (1978) comment on the influence of religious, educational, and political institutions that promulgate attitudes relating to sex stereotypes. The subjects
in the study reported here attended sex-segregated schools throughout their 
education. Further research comparing Mexican adolescents in sex-segregated 
and in non-segregated schools is necessary to ascertain the extent of this 
influence.

The indications of culturally determined differences in speech behavior must 
be carefully interpreted. As warned by Sabin, Clemmer, O'Connell, and 
Kowal (1979), a meaningful psycholinguistic theory of speech development must 
be simultaneously linguistic and cognitive in recognition of multiple response 
measures (p. 53). To this we must add the cultural constraints of language use 
evident to a greater extent with speakers from societies with clearly defined 
sex roles.

Our research into sex related language differences in Spanish has just begun. 
We find our results encouraging, and further studies are already underway.

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