

EFFECTS OF DENTALIZATION AND DEVOICING OF THE /Z/
PHONEME ON LISTENERS' JUDGMENT OF A
SPEAKER'S SEXUAL ORIENTATION¹

ELISA HUFF

The University of South Dakota

SUSAN DAVIS PHILLIPS

University of Arkansas for Medical Sciences

JESS DANCER AND PRISCILLA DAVIS

The University of Arkansas at Little Rock

Summary.—25 undergraduate listeners judged that a male speaker with normal speech, who dentalized (lisped) or devoiced the /z/ phoneme in the context of a sentence, sounded significantly more “gay” in terms of judged sexual orientation than did the same speaker producing /z/ without phonological processes. Speech-language pathologists should be aware of possible social consequences of speech production disorders.

Mowrer, Wahl, and Doolan (1978) investigated the social consequences of a speaker having a frontal lisp, substituting a voiceless ‘th’ for an /s/. The authors asked adult listeners to rate five adult speakers on speaking ability, intelligence, education, and friendship. The speakers looked similar regarding race, hairstyle, and facial features, and the speakers read the same passage. Two of the five speakers were taught to produce a frontal lisp on all /s/ and /z/ phonemes in the passage. Analysis indicated listeners rated the adult speakers with a frontal lisp significantly lower across the five rating areas than the speakers who did not present with a frontal lisp. More recently, Linville (1998) examined the ability of listeners to judge sexual orientation accurately. Twenty-five adult females were asked to make judgments of perceived sexual orientation by indicating on a response sheet whether the speaker was gay or straight. The subjects listened to nine different male speakers read the same monologue. Four of the speakers were straight, and five of the speakers were gay. The monologue contained 25 productions of the /s/ phoneme. Analysis showed listeners correctly identified the sexual orientation of the speakers with 79.6% accuracy. In addition, Linville (1998) found that gay speakers produced the /s/ phoneme with a longer duration and a higher formant frequency when compared to the /s/ productions of straight speakers. She hypothesized that gay men might develop certain articulatory adjustments to provide a distinguishing feature as a mark of membership in the gay community.

¹Address enquiries to Elisa Huff, Ph.D., Assistant Professor, Department of Communication Disorders, The University of South Dakota, 414 E. Clark St., Vermillion, SD 57069.

The senior author had a clinical experience with one upset young man which illustrated Linville's (1998) and Mowrer, *et al.*'s (1978) findings and served as the basis for the present investigation. The young man came in for a speech evaluation because his peers accused him of being gay. Evaluation of his speech identified use of two phonological processes, dentalization (lispings) of /s/ and /z/ phonemes and devoicing of the /z/ phoneme in the final position of words. His fundamental frequency was within the normal range for an adult male. The purpose of the present study was to investigate whether a group of undergraduate students would judge a speech sample to be that of a person with a gay sexual orientation on the basis of changes in the production of /z/ within the context of a sentence. The /z/ phoneme was chosen because this phoneme was affected by both of the client's phonological processes. The reader should note that the /z/ phoneme is the voiced equivalent of the /s/ phoneme.

METHOD

Listeners were 25 undergraduate students who volunteered to participate and were enrolled in a criminal justice course at The University of Arkansas at Little Rock. Subjects remained unidentified by name and were not selected based on age, ethnic group, or sex. The listeners ranged in age from 14 to 44 years (mean age of 28.2 yr.). Of the listeners, 14 were women and 11 were men. Ten and eight, respectively, were Euro-American while the remaining seven listeners were African American.

The speaker was a 37-yr.-old male who had five years of professional speaking experience as a radio announcer. The speaker had normal speech, as well as normal voice quality, resonance, and frequency, as tested independently by two nationally certified speech-language pathologists. The speaker was instructed on how to produce the phonological processes of dentalization of the /z/ phoneme and devoicing of the /z/ phoneme in the final position of words. The speaker practiced reading the sentence stimulus without phonological processes, with dentalization of the /z/ phoneme, and with devoicing of the /z/ phoneme. The sentence stimulus contained 12 words, with two instances of the /z/ phoneme occurring in the final position of two words within the sentence. The sentence stimulus was "They cleaned up the park because the wind blew over the trees." A digital audio tape (DAT) recorder and a Sony F-18 microphone were utilized to record the speaker reading the sentence three times, once without phonological processes, once with dentalization of the /z/ phoneme, and once with devoicing of the /z/ phoneme. Herein, dentalization is defined as the "production of an alveolar consonant with the tongue in a more forward position," i.e., touching the teeth or protruding between them (Hodson, 1991, p. 195) and devoicing is defined as the "deletion of voicing from utterance-final voiced consonants" (Hodson, 1991, p. 169).

The listening tape was prepared by randomizing the speaker's three productions of the sentence three times, providing nine productions for the listeners to judge. Three of the productions were the sentence without phonological processes, three were productions of the sentence with dentalization of the /z/ phoneme, and three were productions of the sentence with devoicing of the /z/ phoneme. Five seconds of silence was inserted following each production of the sentence to allow time for the listeners to make judgments. To establish the validity of the recordings, the completed listening tape was played for three nationally certified speech-language pathologists who had been involved in clinical practice for a minimum of five years. These pathologists were asked to judge whether the /z/ productions within each of the nine sentences were normal, dentalized, or devoiced. Accuracy of the judgments, interjudge reliability, and intrajudge reliability were 100%. The listening tape was then burned into a compact disc (CD) for presentation to the subjects via a CD player.

Prior to presentation of the listening CD, the subjects received a response form and the following instructions: "Listen to the compact disc and using your first impression, judge each sentence you hear as either making the speaker sound gay or straight by circling the word on your response form." The response forms had the numbers 1 to 9 printed on the left margin of the paper and to the right of each number were written the words "Gay" and "Straight." Responses of gay were assigned a value of 1 and that of straight were assigned a value of 2 for the purpose of analysis.

RESULTS

The subjects' responses for each sentence were grouped together, and means and standard deviations were calculated. The data were submitted to Cochran's Q test. The results yielded no significant differences within the judgments of the recordings produced without phonological processes ($Q = .667$, ns), the recordings produced with dentalization of the /z/ phoneme ($Q = .118$, ns), and the recordings produced with devoicing of the /z/ phoneme ($Q = 1.5$, ns). Therefore, judgments of the recordings without phonological processes were pooled together, judgments of the recordings with dentalization of the /z/ phoneme were pooled together, and judgments of the recordings with devoicing of the /z/ phoneme were pooled together. Further analysis utilizing Wilcoxon matched-pairs signed-ranks tests indicated significant differences between judgments of the pooled recordings without phonological process and the pooled recordings of dentalization of the /z/ phoneme ($z = 6.71$, $p \leq .0001$), as well as the pooled recordings of the devoicing of the /z/ phoneme ($z = 5.52$, $p \leq .0001$). The recordings containing phonological processes were judged more often as gay than the recordings containing no phonological processes. No significant difference was found be-

tween judgments of the pooled recordings of the dentalization of the /z/ phoneme and pooled recordings of the devoicing of the /z/ phoneme ($z = 1.54$, ns).

DISCUSSION

Linville (1998) reported that changes in the production of the /s/ phoneme, such as higher peak frequencies and longer durations, are associated with the perception of less masculine speech. The present analysis showed judgments of gay sexual orientation occurred more often than judgments of straight sexual orientation for the productions depicting phonological processes. The more frontal placement of the dentalized /z/ phoneme and the loss of the low-frequency components of the devoiced /z/ phoneme might have increased the perceived frequency of the /z/ phoneme, and the higher-pitched phoneme might have led to the listeners' perception of a less masculine sounding voice (Linville, 1998). Persons wanting to sound less "gay" for whatever reason(s) can request to work with a speech-language pathologist on techniques designed to reduce or eliminate speech patterns associated with less masculine sounding voices.

REFERENCES

- HODSON, B. W. (1991) *The Assessment of Phonological Processes—Revised: analysis of phonological processes*. Danville, IL: The Interstate Printers & Publishers, Inc.
- LINVILLE, S. E. (1998) Acoustic correlates of perceived versus actual sexual orientation in men's speech. *Folia Phoniatrica et Logopaedica*, 50, 35-48.
- MOWRER, D. E., WAHL, P., & DOOLAN, S. J. (1978) Effect of lisping on audience evaluation of male speakers. *Journal of Speech and Hearing Disorders*, 43, 140-148.

Accepted August 18, 2003.