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Study of the effects of fluent and disfluent speech on the speech of listeners

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A STUDY OF THE EFFECTS OF FLUENT AND DISFLUENT SPEECH ON THE SPEECH OF LISTENERS

By

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Chapter 1

INTRODUCTION

This study was concerned with the effects of fluent and disfluent speech on the speech of listeners. Prior investigations concerning the listener to disfluent speech have frequently related disfluency to psychological, organic, and functional contexts. However, there appears to be no evident research related to changes in the listener's speech pattern as a result of listening to disfluent speech patterns.

Research has concluded that disfluency can result in a communication problem which can involve both the speaker and the listener (Bloodstein, 1969). Weiss (1964) and Brutten and Shoemaker (1967) reported research related to the behavioral and affective changes in both the speaker and the listener as they related to disfluent speech patterns. Much of this research related a speaker's disfluency pattern to a change in the listener's attitudes and behaviors. This research will be discussed in detail below, and it indicates that disfluency affects the behaviors and attitudes of both the speaker and the listener. Consequently, the speech fluency of the listener reacting to disfluent speech was observed in this study because the listener's fluency may be

one of the behaviors which are affected by the speaker's disfluency.

The person with a disfluency problem ("stutterer") has been observed and treated in various ways throughout history. His behaviors, including his verbal utterances, have been measured and analyzed in numerous texts and studies. It appears that the disfluent speaker's behavior is affected by his unique physical makeup, the conversational topic being pursued, the tension of the situation, and his environment (including the listener). Van Riper described the speaker's disfluency as a situational problem involved with speaker-listener relationships. The degree of disfluency varies with the degree of communicative responsibility of the speaker in that situation (Van Riper, 1971; Bloodstein, 1969). A listener's behavior may influence the type and degree of disfluency in the speaker. Bloodstein (1969) classified changes in the behavior of the listener as ". . . one of the conditions affecting stuttering." It seemed reasonable to hypothesize that the listener's fluency behavior may be part of this "influencing factor." Because the disfluent speaker's behavior may change as a result of listener reactions, the results of this study may be pertinent to other studies and research pertaining to the disfluent speaker.

Listener behavior has also been a facet of research related to disfluency. In contrast to changes in speaker

behavior discussed above, listener behavior may also change as a result of the speaker's disfluencies and associated behaviors such as body movements, voice patterns, and eye contact. Brutten (1967) cited research concluding that the maladaptive responses of the disfluent person may not only elicit discomfort in the listener to an extent that leads to noxious feeling about the speaker or his behavior, but it may also be an impedance to the communicative process because the listener may be distracted by the nonverbal aspects of speech (e.g., head and/or body movement).

Characteristic behaviors have been observed in the listener reacting to disfluent speech. Rosenburg (1954) evaluated certain listener responses which can be influenced by stuttering. He observed eye contact, hand movements, and "other bodily movements" during stuttering and during normal speech. A decrease in eye contact and an increase in body movement was observed. A study initiated by Sanders (1966) also commented on the listener's bodily reactions to disfluency, and movements similar to those found by Rosenburg seemed to occur when subjects were listening to disfluent speech patterns.

The possibility also exists that a person's own disfluency pattern may change when he is listening to the disfluent speech of others because of the change in the amount of information being conveyed by the disfluent speaker. Folsom (1967) found that listeners were more successful

following directions which contained 30 per cent part-word repetitions than they were when they were following directions containing only 10 per cent part-word repetitions. However, if a listener is going to respond verbally to the disfluent speaker's directions, he may find it necessary to spend more time encoding his thoughts, possibly because of distraction or because of the lack of continuity of the message. Therefore, although a listener may be more successful in following "disfluent directions," the experimenter felt that he may also have more difficulty in making verbal response to these directions.

Communication specialists have related disturbance in spontaneous speech to anxiety; and they have related filled and unfilled pauses to the planning stages of speech. Goldman-Eisler (1964) noted research indicating that 40 to 50 per cent of an individual's speaking time is spent in hesitation and pause (repetition, revision, and filled or unfilled pause). Goldman-Eisler further asserted that pausing may reflect the nonskill aspect of speech, and this "nonskill" is sometimes related to the emotional status of the individual who is speaking. Goldman-Eisler (1964, p. 103) quoted Hughlings Jackson as follows: "Strong emotion leads to inferior speech. . . . With the fall in the intellectual element in the disfluent speech pattern, there is a rise in the emotional element of the listener." Hesitation also tends to limit the amount of information available to the

listener within a constant unit of time. This research would indicate that although repetition may provide more information (Folsom), the amount of information being conveyed would be reduced if "time" were to be a controlled variable. Should the emotion of the listener increase, and the information being conveyed by the speaker decrease, the listener may be impeded in his ability to communicate. McClay and Osgood (1967) stated that the emotional and motivational status of the speaker will increase the frequency of occurrence of hesitation phenomena (repetitions, false starts, and filled or unfilled pauses). This may imply that as the person who is speaking adapts to his topic (e.g., fewer disfluencies occur in each successive reading of a passage), he may not only be familiarizing himself with the topic, but he may also be decreasing his level of anxiety. Thus, one would observe an initially high rate of repetitions, false starts, and filled or unfilled pauses, followed by a decreasing rate of this phenomenon as speech continues.

A listener's attitudes also change with the degree of disfluency elicited by the speaker. The listener may change his attitude about the message or about the speaker delivering the message as a result of the speaker's disfluencies. Shomo and Meador (1969) found that a listener's recall of a message and his attitudes toward a message become less constructive as the number of visual distractions

emitted by the speaker increase.

Changes in the listener's attitude about the disfluent speaker have been measured to determine the effect of disfluency on the general communicative atmosphere in conversation. Chaffee (1969) researched information processing and found that one person's evaluation of another person changes as a function of that person's salience to him. This salience toward the speaker, at least in part, is influenced by the amount of information being conveyed. McDonald and Frick (1954) had students listen to a severe stutterer on audible tape and report their reactions. Categories involving surprise, impatience, embarrassment, pity, amusement, curiosity, sympathy, and revulsion were reported. When a stutterer subsequently spoke to a store clerk, impatience, revulsion, and amusement were common reactions. Boehmler (1953) made reference to the listener's reactions to nonfluency, and he reported certain classifications subjects make when listening to various types of disfluency. He found that listeners are likely to classify sound or syllable repetitions and prolonged sounds as stuttering and revisions or interjections as normal fluency. These particular classifications may be quite significant when they are considered as factors which may affect the listener's attitudes about the speaker. Based on the research of Tuthill, Bloodstein, and Boehmler, Giolas (1958) reported investigations which studied the reactions of adults to different

types and frequencies of speech disfluencies. Giolas also attempted to determine whether children react to disfluencies in the speech of others in a favorable or unfavorable manner. He found that various degrees of disfluency did not affect a child's preference for a particular story presented to him, but it did significantly affect the child's selection of a teacher whom he preferred. (Children tended to choose the least disfluent person.)

Both the speaker's behavior and the listener's behavior must eventually be observed as interacting "speaker-listener" relationships because the behaviors and attitudes of one will usually affect the behaviors and attitudes of the other (including disfluency). Any avoidant behavioral reaction of the listener may be of significance because it may reinforce (increase the probability of occurrence) the speaker's disfluent pattern. If the listener causes the disfluent speaker to develop an increase in disfluencies, he may very well be the stimulus causing a communicative deficit in the speaker. In turn, the disfluency elicited by the speaker may not only affect the listener's feelings and attitudes toward him, but these disfluencies may also result in an increase in the listener's own disfluencies.

This research indicates that it is quite feasible that listener reactions (disfluent or affective) may result in behavioral change in the disfluent speaker. Therefore, evidence related to listener disfluency patterns may be of

therapeutic or communicative interest to individuals in the fields of speech pathology or general communication. A measure of the listener's verbal response to disfluent speech will allow for a more precise investigation into speaker-listener behavior and its effects on the individual (speaker or listener).

Statement of the Problem

In view of the literature and research regarding disfluency, particularly that research pertaining to the relationship between disfluency, anxiety, and speaker-listener relationships, the value of a study on listener fluency changes resulting from exposure to disfluent speech seemed worthy of research.

The following question was of central concern: Do adults exhibit a change in the disfluency of their own speech after they listen to a disfluent speech pattern? The experimenter hypothesized that there would be an increase in the total number of disfluencies in the listeners' speech after they had listened to a disfluent speech pattern. Thus, it was anticipated that analysis of the data collected would lead to the rejection of the null hypothesis.

Definition of the Variables to Be Observed

The experimental variables in this study were (A) independent--(1) exposure to fluent speech and (2) exposure to disfluent speech; and (B) dependent--the total

number of disfluencies per one hundred words in the listener's subsequent speech pattern.

Speaker's fluent speech. Speech which follows appropriate grammatical rules and contains as few interruptions in its phonetic, morphemic, or prosodic features as possible. Ten or fewer interruptions (sound, syllable, word, and sentence repetitions or revisions; prolongations; or interjections) per two hundred words was the contingency set by the experimenter for an acceptable fluent speech tape. Secondary body characteristics (facial movements, bodily movements characterized by "to and fro" movement, or stress of the laryngeal musculature) were not present in this speech pattern.

Speaker's disfluent speech. Any interruption in a fluent speech pattern (as defined above) and containing not fewer than 25 sound, 25 syllable, and 25 word repetitions; 6 sound, 12 word, 3 sentence, and 3 phrase revisions; 6 prolongations of sounds, and 30 interjections. This speech pattern was characterized by facial movements (eye squints and cheek movements) and frequent "to and fro" body movements of the speaker simulating the behavior of a clinical (stuttering) population.

Listener's disfluent speech. Any interruption in the listener's pattern of uttered speech (sound, syllable,

word, and phrase repetitions; sound, syllable, word, and phrase revisions; prolongations of sounds; and interjections).

Chapter 2

PROCEDURE

Selection of Speech Samples

Two samples of speech, fluent and disfluent, were videotaped using a Shiboden (Model HV-15 CCTV) camera; Shure Dynamic (Model 51) microphone; and a Sony (Model EV-210) Videocorder. The speaker on both of these tapes was a male Caucasian (age 27). In each of the two speech samples, the speaker sat at a table in a 12' X 15' room (light background) with only his head, chest, and arms in view so that bodily behaviors which differentiate a clinical (stuttering) population from a non-clinical population (as defined under fluent speech and disfluent speech of the speaker) would be illustrated. One tape illustrated the person speaking with a fluent speech pattern about the war in Vietnam; and the other tape illustrated the same person using a disfluent speech pattern (refer to "Speaker's Fluent Speech" and "Speaker's Disfluent Speech" in Chapter 1) to talk about the same topic. The same speaker presenting the same topic with similar content was used so that the influence of the speaker's subject matter, individual differences, or sex would have minimal effects on the dependent variable. The Vietnam War was selected as topic material because of its

contemporary and political nature, which would hopefully elicit varied emotions and sufficient verbal output from listeners for subsequent measurement and analysis.

Selection of Listeners

A group of thirty male volunteer listeners participated in the experiment. This sample was taken from a population of students enrolled in introductory speech courses at the University of Montana during spring session, 1972. Students were instructed that they were needed for an investigation pertaining to the area of speech pathology and audiology. They were advised that they would participate in the experiment individually with the experimenter. However, they were also notified that no further information pertaining to the experiment could be revealed until all subjects had completed the experiment. Subjects were randomly divided into two groups for order. Grouping was done by ordering the occurrence of two experimental conditions (Order A: fluent speech videotape presentation-disfluent videotape presentation; Order B: disfluent videotape presentation-fluent videotape presentation). As each subject appeared for the experiment, he was assigned a number (1-30) in order of his appearance for the experiment. Subjects receiving odd numbers were assigned Order A, and even-numbered subjects were assigned to Order B.

Apparatus

The apparatus consisted of an experimental room (12' X 15') which contained a Setchell Carlson Videotape Monitor (Model 2100 SD) with volume control adjusted so that average sound pressure level output was between 55 and 65 dB(A) at the listener's ear. A Bruel and Kjaer (Model 2203) Sound Level Meter was used to measure sound pressure level output. An auditory tape recorder (Uher Model 400 Report L) was used to record listener responses. Each listener was seated 8 feet from the video tape monitor, and the experimenter was seated in a chair facing the wall to the left of the listener. While the listener was speaking, the experimenter sat (arms folded) and looked at the wall. No facial gestures (smiles, frowns, etc.) were exhibited by the experimenter after the subject was seated in the experimental room.

Experimental Procedure

Each subject participated individually in the experiment. (One subject was observed and recorded at a time.) Subjects participated in the experiment between 10:00 a.m. and 3:00 p.m., Monday through Friday.

The subject was asked to enter the experimental room and be seated facing the television monitor. When the subject was seated, he was asked to state his name, age, and year in school. He was then asked to talk about his future

vocation, jobs which interested him, or any other information pertaining to what he would like to do when he finished college. This information (Job Task) would subsequently be analyzed to determine the degree of normalcy of his speech as compared to previous studies (Johnson, 1961; unpublished raw data). The recording microphone was placed approximately 3 feet from the speaker, and all responses were recorded. The subject was then given instructions related to the experiment (Appendix A). These instructions directed the subject to view a videotape recording, respond verbally (3 minutes) to a statement made by the experimenter; view a second videotape, and again respond (3 minutes) to a second statement made by the experimenter. Numbers (1-30) were assigned to subjects in order as they appeared for participation in the experiment. Listeners who were assigned odd numbers (1, 3, 5, etc.) viewed the fluent speech tape; responded to a stimulus statement made by the experimenter; viewed the disfluent speech tape; and responded to a second stimulus statement made by the experimenter. Subjects who were assigned even numbers (2, 4, 6, etc.) followed the same procedure, but the order of taped presentations was reversed (disfluent tape-respond, fluent tape-respond). The two stimulus statements (Appendix B) used by the experimenter to elicit verbal responses were counterbalanced to reduce the order effect on the dependent variable. For subjects numbered 1-15, Statement A was given

following the initial tape viewing, and Statement B following the second tape viewing. The order of statement presentation was reversed for subjects numbered 15-30. When each listener's response had been completed, he was given a questionnaire containing questions pertinent to the experiment (Appendix C). When the listener had completed the questionnaire, he was asked not to discuss the experiment for two weeks. He was then dismissed.

When all subjects had completed their participation in the experiment, taped responses were placed in random order, and disfluencies were counted. Ninety speech samples were analyzed. Each of the thirty subjects produced three speech samples (Job Task responses, response to the fluent tape, and response to the disfluent tape). The first two hundred word utterances (excluding repeated or revised sounds, words, phrases, or interjections) or a three-minute speech sample (whichever occurred first) were used in this disfluency count. The experimenter independently analyzed each sample, and he secured an average total number of disfluencies per one hundred words for each sample. A graduate student in speech pathology and audiology was trained by the experimenter to analyze disfluencies in speech samples so that a correlation between his judgments and the experimenter's judgments could be made. The graduate student was trained by listening to a taped speech sample with the experimenter, and he was then asked to count the number of

disfluencies using the following criteria:

1. Interjection of sounds, syllables, or words. This included extraneous sounds such as "uh," "er," and "um"; or extraneous words such as "well" and "you know" which are distinct from sounds and words associated with the fluent pattern of speech.

2. Part-word repetitions. Repetition of parts of words, i.e., syllables and sounds, are placed in this category.

3. Word repetitions. Repetition of whole words, including words of one syllable, are included in this category.

4. Phrase repetitions. Repetitions of two or more words are included in this category.

5. Revisions. Instances in which the content of a phrase is modified, or in which there is grammatical modification. This included changes in the pronunciation of a word.

6. Broken words. This category is typified by words which are not completely pronounced, and which are not classifiable in any other category, or in which the normal rhythm of the word is broken in a way that definitely interferes with the smooth flow of speech. "I was g-(pause)-oing home," is an example of a broken word.

7. Prolonged sounds. Sounds or parts of words which are judged to be unduly prolonged are included in this category (Johnson, Darley, and Spreistersbach, 1963).

Although these types of disfluencies were described for training purposes and procedures, the experimental analysis of the data involved only the total number of disfluencies per one hundred words. Therefore, an average per one hundred words was taken from the total word output for each individual speech sample. When the training procedure had been completed, the trained graduate student and the

experimenter independently analyzed the first thirty of the ninety randomized speech samples. A Pearson (product-moment) correlation was used to compare the graduate student's analysis with the experimenter's analysis. A correlation of .94 was achieved, indicating that there was high agreement between two independent judges.

A coefficient of risk of .10 was used for analyzing the data. This level was selected because the study was exploratory in nature, and significant differences noted at this level could provide information which could be more precisely examined at another time. Also, due to the exploratory nature of the experiment, abandonment of this level of inquiry if, in fact, the experimental hypothesis was true, seemed far more serious than pursuing the question further and finding the experimental hypothesis to be false.

Chapter 3

RESULTS

The data in this study consisted of three fluency tallies for each of the thirty listeners. A baseline fluency count was taken for each listener so that the mean number of disfluencies of the experimental group could be compared to normal fluency data pertaining to an adult male population. Johnson (1961) reported the mean number of disfluencies per one hundred words for adult males to be 7.54 with a standard deviation of 14.1 (N=50). The mean number of disfluencies per one hundred words for the subjects in this study was 8.17 with a standard deviation of 12.64. A t-test comparing Johnson's normal adults to the baseline data from the current study was used to test the null hypothesis. A "t" of .756 (df=78) was obtained and is significant at higher than 40 per cent. Thus, it was assumed that the population used in this experiment was not different from a normal population. A fluency tally for "fluent speech" responses and "disfluent speech" responses composed the other two samples of each subject's speech. These fluency measures involved the counting of the total number of disfluencies averaged per one hundred words. (Disfluency counts averaged per one hundred words are listed

in Appendix D.) Examination of the mean score for each order effect indicates that no significant influence exists due to the order of presentation of tapes. Therefore, this variable was not isolated in the analysis. (The mean number of disfluencies per one hundred words for Order A was 10.21; and the mean number of disfluencies per one hundred words for Order B was 10.34.)

The question considered in the statistical analysis was whether the null hypothesis would be rejected as predicted. A t-test[1] for repeated measures was employed to determine if significant differences existed between total disfluency averages following fluent speech and following disfluent speech.

A difference (D) score was used as a factor of the t-test utilized. This difference score was determined by finding the difference between a subject's "fluent speech" responses and his "disfluent speech" responses. A negative (-) difference resulted if fluent speech response totals were greater than disfluent speech response totals for any individual listener. The mean of the "fluent speech" responses was 9.50, and the mean for the "disfluent speech"

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[1] $$t\ (df=N-1 = \frac{\overline{D} - \mu_d}{Sd} \sqrt{N-1}$$

N=Number of D values in the sample.
$\overline{D}$=The mean of the sample of D values.
Sd= The standard deviation of the sample of D values.
μ_d=The mean of the population of D values (Blommers and Lindquist, 1960, p. 350).

responses was 11.58. A "t" of 2.638 (df=29) was obtained and was significant at the .01 level. Therefore, the number of disfluencies following the disfluent speech sample was found to be significantly greater than the number of disfluencies following the fluent speech sample.

In summary, the null hypothesis was rejected, and it seems reasonable to assume that listening to disfluent speech results in an increase of disfluencies in the listener.

Subject responses on the completed questionnaire (Appendix E) indicated that twenty-seven subjects completely understood the directions pertaining to the experiment. The three subjects who reported that they did not completely understand these directions indicated that their only confusion was whether they were to respond solely to the topic material presented or to both the topic material and the subject's speech pattern. In response to the question, "Do you feel that you understood what the purpose of the experiment was?" five subjects commented that the experimenter was observing the changes in their speech patterns when they were responding to the tapes. However, four of these five individuals exhibited an increase of disfluency after viewing the disfluent speech tape. Six listeners reported that they were conscious of changes in their speech pattern when they responded to the "disfluent speech" message. (Three subjects reported that they "stuttered" more following the disfluent tape viewing; one subject reported that his speech became

more choppy; one subject indicated that he hesitated longer between statements because he did not want to be repetitious; and one subject reported that he became more "tense" after he had listened to the disfluent tape. In general, responses to questions contained in the questionnaire indicated that subject error, if any existed, was minimal.

Chapter 4

DISCUSSION

The purpose of this study was to assess the effect of disfluent speech on the speech of listeners. In particular, two groups of fifteen subjects were receivers of two messages (one delivered with disfluent speech and the other delivered with fluent speech). Both of these messages were similar in content and direction, and they both contained statements which were antagonistic toward the war in Vietnam. The listeners responded to statements made by the experimenter, and the disfluencies in their speech were subsequently counted. This data was analyzed to determine if fluency changes were taking place in the listener.

Analysis of the results yielded differences which were significant at the .01 level. Listeners were more disfluent following "disfluent speech" than they were following "fluent speech."

The behavior change observed in this study is of therapeutic and communicative interest to the experimenter, particularly as it relates to previous research and theories concerning the cause of disfluency. The significant increase of disfluency found in this study is consistent with results concerning other behaviors involving the listener reacting

to the speaker's disfluencies and body movements. Much of the behavior change observed in other studies was of the type which would have a negative effect on communication. Specifically, negative attitudes develop in the listener (feelings of surprise, revulsion, embarrassment, pity, impatience, amusement, and sympathy have been reported); and the listener's body movements (decreased eye contact and increased head and arm movement) change when he listens to disfluent speech. The increase in negative attitudes, the decreased eye contact, and the increased head and arm movement are all responses which plausibly accompany an increase in body tension. Likewise, increased tension is conducive to increased disfluency. Therefore, all of these changes in listener behavior are consistent with increases in listener tension.

The listener could have responded to the variables in this study by increased disfluencies for several reasons. As suggested above, one reason for increased disfluencies is that the various reactions and attitudes of the individual listeners to the variables in this study probably affected the amount of tension in their responses. This would be particularly true if voice, body movement, and disfluencies are combined to represent the disfluent speaker as they were in this study. This increase in tension probably plays an important role as an influence on the number and type of the listener's subsequent disfluencies.

Although an increase in tension seems to be the most plausible explanation, the listener could also have been using the speaker as a "linguistic model" to be imitated. Since the development of speech and language is quite dependent upon the speech models of others, and since differences in speech dialect appear to result (at least in part) from the speech habits of the people in a particular geographic location, it is possible that a listener's disfluencies could also be an imitation of the speaker's patterns of disfluent speech.

Since the disfluent speaker used in this study exhibited variation in voice, body movements, and disfluencies, it is difficult to pinpoint the exact stimulus causing the increase in the disfluency of the listener. Therefore, these variables should be isolated and studied to determine their individual effects on the listener's speech.

Variations in vocal quality, pitch, and intensity which differed from the fluent to the disfluent message could have resulted in observed listener reactions. In this study, the fluent speech sample was characterized by a wide pitch range, frequent pitch variation, and strong emphasis (stress) on certain parts of speech. The disfluent sample was more monotonous, contained fewer intensity variations, and seldom contained stress on important words. This monotonous, unvaried quality of the disfluent speech sample could have been a factor influencing listener disfluency

because it could decrease the listener's attention to the message and increase his attention to the disfluent struggles of the speaker. Ultimately, this could increase listener tension and result in increased listener disfluency.

Certain body movements may also have an effect on the listener's response. Head, shoulder, or arm movement accompanying the speaker's utterance could cause the listener to change both his attitudes and his behaviors. The disfluent sample used in this study contained bodily movements simulating a clinical (stuttering) population. Eye squints, head movement, and facial posturing accompanied certain disfluencies, and these movements may have had an effect on the listener's speech pattern. These movements could distract the listener and ultimately hinder his understanding of the message. They could also be a stimulus for increased tension, which, in turn, could cause an increase in disfluencies.

The disfluencies in the speaker's statements is an important variable to examine when disfluency problems are being considered. The literature cited in this study indicates that a speaker's disfluency affects the attitudes and the bodily behaviors of the listener. In addition, this study suggests that the speech of the listener is also affected. Therefore, the type and number of disfluencies in the speaker's utterance should be varied and analyzed in

future research to determine their isolated or combined effects on the speech of listeners.

Both the topic and the speaker were constants in this study, but they undoubtedly had varied effects on the disfluencies of the listeners across the fluent and disfluent conditions and limit the generalizability of the results. The topic of the samples used in this study (the war in Vietnam) was chosen because of its emotional nature. The experimenter felt that the emotional reactions to this topic would increase the tension of the situation and would be more conducive to disfluent responses. Some of the subjects in this study appeared to be quite rebellious toward the content of the speech samples; others were quite agreeable. Message content and the manner in which the speech was delivered probably influenced the listener's responses. A message which is quite compatible with one person's feelings and attitudes may be quite antagonistic toward another listener's feelings and attitudes. Because of this "message effect," the entire source of the listener's disfluencies is difficult to pinpoint. The examiner subjectively felt that the listeners who were in disagreement with the speaker or the message became more nervous, responded with greater vocal intensity (loudness), and revised their statements more frequently. It is difficult to generalize what the effects of different messages or topics would be on the speech of listeners. However, messages with low information content,

messages which arouse the listener (increase tension), or messages with content which is unfamiliar to the listener would all probably result in increased disfluent responses.

The speaker was a constant in this study. However, every individual speaker has a unique personality and appearance which is different from any other speaker. Therefore, the effect of individual personality and appearance on the listener's speech should be considered. The speaker's salience to the listener can vary, depending on the various attitudes the listener develops about the speaker's personality or appearance. Should negative attitudes develop, increased tension and disfluency in the listener could result.

There could also be an interaction between the effect of disfluent speech on listener responses as found here, and both variables of topic and speaker. These variables should be isolated in further studies to investigate the generalizability of the results found in this study.

The circular pattern between speaker and listener and back to speaker has had significant attention in the stuttering literature. The behavior of the disfluent speaker (stutterer) reacting to increased listener disfluencies were not measured in this study. However, these reactions should also be considered in future research. The disfluent speaker may interpret the disfluent speech

responses of the listener as a ridicule. This could change the speaker's behaviors and attitudes about the listener. An increase in listener disfluency could cause the speaker to become more aware of his own disfluencies. Subsequently, he (the disfluent speaker) might develop avoidance behaviors, even withdrawing completely from the speaking situation. Finally, it is most likely that the speaker will become more disfluent than he was originally. If both the speaker and the listener become more disfluent as a result of their verbal interaction, this increase in disfluency could become "self-perpetuating." Should this be the case, a drastic hindrance to communication could result.

The experimenter was particularly interested in the therapeutic considerations related to this study. If a clinician working with a disfluency problem should incur an increase in disfluency in his own speech, a negative emotion or an interference with the client-clinician relationship could result. If this were the case, the credibility of training student-clinicians to communicate with stutterers in a manner that allows them to maintain control over their own disfluencies should be considered. Finally, the disfluent speech of parents or peers should be considered as a possible factor related to the development of disfluency problems (stuttering) in children.

Recommendations

Since this study was exploratory in nature, it was

hoped that one result would be more research in this area. The possibilities for experimental manipulation are numerous for the type of procedure used in this experiment. Some of the following possibilities should be considered:

The type of disfluency emitted by the listener may change as the amount of information conveyed or the tension level of the listener changes. A speaker or a message which results in an increase in listener tension may cause an increase in sound, syllable, or word repetitions. If the amount of information made available by the speaker is reduced, an increase in interjections or revisions seems to be a more likely result since these types of disfluencies are often used as timing devices which allow for a more complete processing of information for subsequent speech delivery. In this study, disfluencies in the "disfluent speech sample" were structured in a manner that would result in an increase in listener tension (struggle of the speaker to complete his utterances) so that increased repetitions in the listener's speech likely compared to other types of disfluencies. However, it is plausible that increased tension would result in language formulation problems which could be evidenced by other types of disfluencies. In fact, the investigation of increased tension in the listener should be verified by direct measurement.

The effect of age and sex differences on listener disfluency should also be considered for future research

because they play an important role in the development of disfluency problems.

Age could be a variable having an effect on speaker-listener interaction and listener disfluency. The interaction between two adults will be somewhat different than a parent-child or a child-child interaction.

The effect of sex differences should be studied because sexual differences have had variable effects on the development of disfluency problems. The effect of a female stutterer's speech on the male listener's disfluency pattern (and vice versa), and the variety of effects a parent may have on his/her son or daughter are important considerations to be made when disfluency problems are developing. Disfluency problems occur more often in males than in females (Bloodstein, 1969), and the mother-son relationship seems to be the most frequent source of difficulty in this development of disfluency problems in male children.

Thus, research pertaining to these relationships is needed so that the etiological factors related to the development of disfluency problems can be more thoroughly understood. More complete knowledge and more precise information regarding speaker-listener behavior is needed so that proper prevention and correction of disfluency problems can take place.

Chapter 5

SUMMARY AND CONCLUSIONS

The purpose of this study was to assess the effect of disfluent speech on the speech of listeners. In particular, two groups of fifteen male subjects were receivers of two messages (one delivered with disfluent speech and the other delivered with fluent speech). Both of these messages were similar in content and direction, and they both contained statements which were antagonistic to the war in Vietnam. The subjects listened to a fluent speech sample and a disfluent speech sample on videotape and verbally responded to statements concerning the individual samples. The order of presentation of the speech samples was alternated for each subject so that any order effect on the listener's responses could be minimized. All verbal responses of the listeners were tape recorded for analysis. Each listener's "fluent speech" response and "disfluent speech" response was placed in random order so that the total number of disfluencies in each sample could be counted in an unbiased manner. Sound, syllable, and word repetitions; sound, syllable, and word revisions; prolongations of sounds; and interjections were used in this fluency count. An average total number of disfluencies per 100 words was

taken for each speech response.

The mean of the "fluent speech" responses of the subjects was 9.50, and the mean of their "disfluent speech" responses was 11.58. A "t-test" for repeated measures was utilized to see if significant differences existed between the two means. A t of 2.638 (df=29) was obtained and was significant at the .01 level. The null hypothesis was rejected, and it was assumed that "disfluent speech" results in an increase in the disfluencies of the listener.

These results were consistent with findings of other studies which involved changes in listener attitudes and changes in their body behavior as a result of listening to disfluent speech. Specifically, negative attitudes develop in the listener, and they exhibit a change in bodily behavior (decreased eye contact and increased head and arm movement). These behaviors are logically accompanied by an increase in tension, which is conducive to an increase in disfluency.

Limitations of the generalizability of this study were discussed, and implications for further research were presented.

APPENDIX A

INTRODUCTORY STATEMENTS AND DIRECTIONS MADE BY THE EXPERIMENTER TO THE SUBJECT

My name is _____. Please come in and be seated facing the television monitor.

When the subject had been seated, the following statement was made:

(NAME), you are about to participate in an experiment. When the experiment has been completed, you will receive a summary explaining the purpose of the experiment, the importance of your participation in the experiment, and a statement of the results. Please do not speak to anyone about the experiment until it has been concluded.

You are about to listen to and view two video tapes, and you are going to be asked to respond to the subject matter contained on both of these tapes. After you have viewed the first tape, you will be asked to respond to a statement for three minutes. You will then view a second tape, and you will again be asked to respond to a statement for three minutes. While you are responding to the statements made to you, I will not be able to speak to you or make any gesture toward you. Therefore, you will be entirely on your own.

Do you understand what has been said to you? Are there any questions?

If the subject does not understand a particular aspect of the experiment at this point, the examiner may repeat the above directions.

You are now ready to view the first tape. Please look at the television monitor in front of you.

The tape monitor is turned on, and the subject views the first videotape. When the tape is finished, the subject is asked to make a verbal statement response to one of two statements made by the experimenter (Appendix B). Following this response, the following statement is made by the experimenter:

You are about to view another taped recording. When the tape has ended, you will again be asked to make a three-minute verbal response. Please make an attempt to express as many of your feelings as possible. Observe the monitor in front of you and view the second video tape.

APPENDIX B

STATEMENTS MADE TO THE SUBJECTS AFTER THEY HAVE FINISHED VIEWING THE VIDEOTAPES

Statement A

You have just finished viewing a videotape in which the speaker expressed his opinions about the war in Vietnam. I would like you to speak for three minutes about this topic. Express any disagreement, sympathy, or additional information you may have about this topic; and feel free to restate any opinions which you might have already expressed. I will remain in the room, but I will make no gesture or response while you are speaking. Remember, express any of your feelings, regardless of how insignificant they may seem to you.

Statement B

The speaker you have just finished observing had many feelings about the Vietnam War. Express any feelings you may have about this situation. If you have already expressed some of these opinions, feel free to revise or restate them in any manner you may desire. I will remain in the room, but I will not respond or gesture to you during your three-minute response. Express any feelings you may have, regardless of your political views or personal feelings.

APPENDIX C

QUESTIONNAIRE FILLED OUT BY THE SUBJECT

WHEN HIS STATEMENTS WERE CONCLUDED

Name _____ Time _____ Code ____
Age _____ Year in College _____
Date _____

I would like you to answer the following questions because they are relevant to this experiment. Any response you make will be used to help us interpret our findings and they will not be used for any other purpose.

1. Do you feel that you clearly understood the instructions given for the experiment? Yes ____ No ____

   If your answer is no, what part of the directions did you misunderstand? _____
   _____

2. Do you feel that you understood what the point or purpose of the experiment was? Yes ____ No ____

   If your answer was yes, describe the purpose of the experiment. _____
   _____

3. Do you think you consciously responded any differently to either of the two videotapes? Yes ____ No ____

   If your answer was yes, please describe the way you responded. _____
   _____
   _____

4. Can you describe briefly what was different about the two tapes? _____
   _____
   _____

Do you have any other comments related to this experiment?
_____
_____
_____

APPENDIX D

AVERAGE TOTAL NUMBER OF DISFLUENCIES PER ONE HUNDRED WORDS FOR THIRTY SUBJECTS

Subject No.	Baseline	Fluent Condition	Disfluent Condition	Difference
1	5.31	16.00	12.90	-3.10
2	6.00	6.00	8.00	2.00
3	3.03	6.50	8.00	1.50
4	13.00	8.00	18.00	10.00
5	4.19	9.00	10.40	1.40
6	4.80	5.50	10.00	4.50
7	4.38	3.79	5.50	1.76
8	13.90	14.50	18.00	3.50
9	7.00	4.00	5.00	1.00
10	11.40	16.50	16.50	0.00
11	10.10	3.50	11.00	7.50
12	9.00	5.50	6.50	1.00
13	12.30	13.00	13.00	0.00
14	3.50	7.50	8.00	.50
15	6.00	13.00	11.00	-2.00
16	6.60	5.50	5.30	-.20
17	11.00	11.00	16.50	5.50
18	11.30	16.50	15.00	-1.50
19	5.30	2.50	7.50	5.00
20	9.50	10.00	13.80	3.80
21	10.80	23.00	16.00	-7.00
22	4.40	16.00	19.60	3.60
23	9.00	10.00	17.10	7.10
24	7.76	4.50	11.50	7.00
25	6.02	3.50	5.00	1.50
26	12.60	7.00	19.40	12.40
27	9.80	17.50	11.50	-6.00
28	7.60	11.00	10.50	-1.50
29	12.10	13.00	14.50	1.50
30	2.59	2.00	2.50	.50

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