

The Effects of Vocalics and Nonverbal Sensitivity on Compliance A Speech Accommodation Theory Explanation

DAVID B. BULLER
R. KELLY AUNE
University of Arizona

A speech accommodation theory explanation for the interaction between a receiver's decoding ability and a speaker's voice tone on compliance with requests for help was tested. It was predicted that good decoders would speak faster than poor decoders. Speech accommodation theory predicts that given this speech style difference, good decoders would make more favorable interpretations of a fast request that converged toward their faster speech rate, whereas poor decoders would make more favorable interpretations of a slow request that converged toward their slower speech rate. Requests receiving more favorable evaluations should result in greater compliance, because compliance with requests for help was predicted to follow an identification process. An experiment involving 168 participants confirmed this explanation. Good decoders spoke faster than poor decoders. Moreover, good decoders rated the fast request as more intimate and immediate, while poor decoders rated the slow request as more intimate and immediate. Good decoders, in turn, complied more with the fast request, which they rated more intimate and immediate, whereas poor decoders complied more with the slow request, which they rated more intimate and immediate.

SENSITIVITY to nonverbal cues has been the subject of a large number of studies exploring its mediating role in interpersonal interactions (Rosenthal, 1979; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979). Two recent experiments (Buller & Burgoon, 1986; Hall, 1980) examined the impact of nonverbal sensitivity

David B. Buller (Ph.D., Michigan State University, 1984) is an assistant professor of communication at the University of Arizona. *R. Kelly Aune* (M.A., Sangamon State University, 1984) is a doctoral candidate in the Department of Communication at the University of Arizona.

Human Communication Research, Vol. 14 No. 3, Spring 1988 301-332
© 1988 International Communication Association

in persuasive interactions. Rather than having a main effect on a receiver's compliance—decoding skill leading to more compliance—an individual's level of nonverbal sensitivity produced differing patterns of compliance. As yet, no clear explanation for this effect has emerged. Neither an insensitivity nor an expectancy-violation explanation has accounted for the results. The present experiment tested a speech accommodation theory explanation (Giles, 1980; Street & Giles, 1982).

Previous Research

In an experiment designed to show that nonverbal sensitivity mediated persuasive outcomes, Hall (1980) reported an unexpected disordinal interaction between decoding ability and compliance. Consistent with her a priori predictions, good decoders complied more with voices intended to be persuasive (more expressive, less stiff, and warmer) than with voices intended to be less persuasive (less expressive, stiffer, and colder); however, contrary to her predictions, poor decoders complied less with highly persuasive voices and more with less persuasive voices.¹ Hall offered an insensitivity explanation for these findings. She argued that good decoders' compliance was a function of accurately decoding the persuasive cues in the voices. In contrast, poor decoders became defensive, reactant, and less compliant when encountering highly persuasive voices, because they were unable to decode the affective overtones. Poor decoders, though, were less defensive and more compliant with less persuasive voices, because they contained quantitatively fewer nonverbal cues.

In a follow-up experiment, Buller and Burgoon (1986) tested an alternative explanation derived from nonverbal expectancy violations theory (Burgoon, 1978, 1983, 1985; Burgoon, Coker, & Coker, 1986, Burgoon & Jones, 1976; Burgoon, Stacks, & Woodall, 1979). They speculated that receivers hold expectations about the vocal behavior of others. Violations of those vocalic expectations activate and redirect attention to source characteristics and interpretations of the violation. The reward value of the source influences whether the vocal violation is interpreted as positive or negative. Positively labeled violations lead to greater compliance, whereas negatively labeled violations lead to less compliance. Unfortunately, their results, while confirming the hypothesized interaction between a receiver's decoding ability and a speaker's voice tone, failed to confirm the nonverbal expectancy violations

explanation. Contrary to predictions, good and poor decoders did not evaluate source reward differently.

The most important aspect of Buller and Burgoon's experiment was their analysis of receivers' credibility evaluations and relational interpretations of the voices. Buller and Burgoon had their interviewees encode three voices: pleasant, neutral, and hostile. Their pleasant and neutral voices were designed to approximate Hall's high and low persuasive voices, while the hostile voices were created to test the linearity of the decoding ability interaction. Pleasant voices were high in pleasantness and similar to the neutral voice on assertiveness. The hostile voice was less pleasant and more assertive than the neutral and pleasant voices.

Buller and Burgoon showed that poor decoders recognized changes in vocalic cues, and assigned the same credibility, immediacy, and dominance interpretations to these changes as good decoders. Poor decoders, however, made different interpretations of the vocalic cues along dimensions of intimacy and emotional arousal. Good decoders interpreted pleasant and neutral voices as more intimate and less aroused, whereas poor decoders rated pleasant voices as less intimate and more aroused. Interpretations of hostile voices were just the opposite. Thus it seems that poor decoders were able to recognize and decode nonverbal cues in both voices, but their interpretations did not always match those by good decoders. It should be noted that Hall's speculation that poor decoders find emotional situations unpleasant bears some similarity to this line of reasoning. Finally, the differences in relational interpretations paralleled the receivers' compliance pattern. That is, interpretations of intimacy and relaxation accompanied greater compliance among both good and poor decoders.

Speech Accommodation Theory

Any explanation of these effects must explain the interactions on intimacy and arousal interpretations as well as the main effect of voice tone on immediacy, dominance, and credibility, and ultimately the interaction on compliance. Buller and Burgoon suggested that speech accommodation theory (Giles, 1980; Street & Giles, 1982) might account for all of these findings.

Speech accommodation theory holds that "communicators are motivated to adjust their speech styles with respect to one another as a

means of expressing values, attitudes, and intentions" (Street & Giles, 1982, p. 205). Speech style changes either converge toward the receiver's own vocal style, diverge from that style, or maintain the speaker's initial style (i.e., no change in style). The receiver's perceptions of these speech style changes determine her or his evaluative and behavioral responses. Perceptions are a function of (1) recognizing a change, (2) evaluating the change relative to the receiver's own style, and (3) attributing intent to the change. Positive evaluations occur when the change is seen as being an optimal distance from one's own style and resulting from positive intent.

Speech accommodation theory has been tested on speech rate differences (Putman & Street, 1984; Street, 1984; Street & Brady, 1982; Street & Giles, 1982). This research shows that speakers adjust their speech rates, both diverging from and converging toward the receiver's rate. Changes in speech rate affect ratings of credibility in the form of competence and dynamism, and relational interpretations, such as benevolence and social attractiveness. More important, the effects on credibility and relational interpretations follow different patterns. Generally, speakers are judged to be more competent as their speech rate increases relative to the receiver's rate (Street, 1984; Street & Brady, 1982). This parallels research on speech rate in the persuasion literature, which shows increased speech rate is associated with higher credibility (Gundersen & Hopper, 1976; Mehrabian & Williams, 1969; Miller, Maruyama, Beaber, & Valone, 1976; Pearce, 1971; Pearce & Brommel, 1972; Smith, Brown, Strong, & Repcher, 1975). Competence has been conceptualized as a subdimension of credibility (McCroskey, Hamilton, & Weiner, 1974; McCroskey, Jensen, & Valencia, 1973). In contrast, while increased speech rate generally increases the social attractiveness of the speaker, convergence of the speaker's rate to the receiver's rate produces an even more favorable interpretation on this relational dimension while divergence detracts from social attractiveness (Putman & Street, 1984; Smith et al., 1975; Street & Brady, 1982).

These contrasting interpretations appear to be consistent with the interpretations made by Buller and Burgoon's respondents. Voice tone had a main effect on credibility judgments, but interacted with decoding ability to influence intimacy and arousal judgments. It is plausible that these latter interactions resulted from convergence in speech styles. However, to apply speech accommodation theory, one must assume that good and poor decoders display different speech styles that influence their relational interpretations of voices.

To test this prediction, it is preferable to focus on a single vocal cue, since much of the evidence for accommodation effects comes from research on individual vocal cues. It is difficult to isolate the effect of individual cues within general voice tone manipulations such as those employed by Hall and Buller and Burgoon. In the speech accommodation research, speech rate has provided some of the most consistent evidence for accommodation effects. Moreover, as noted previously, receivers' reactions to divergence and convergence in speech rate bear similarity to the decoding ability interactions on relational interpretations observed by Buller and Burgoon. In the present experiment, therefore, attention was focused on changes in speech rate and decoders' interpretations of these changes in a first attempt to apply the speech accommodation theory to the decoding ability-voice tone interaction.

To test the accommodation theory explanation, the following hypotheses were formulated. First, speech accommodation theory predicts that a speaker will increase speech rate to indicate higher competence in the current interaction. In turn, faster speech rate, when recognized, is stereotypically interpreted as indicative of higher competence. Therefore, increases in rate should have a positive relationship with credibility perceptions.

(H1) A speaker will be perceived as more credible when making a fast request for help than when making a slow request.

It is also hypothesized that speech rate will have a main effect on perceptions of dominance. Burgoon and Hale (1984) argued that messages indicative of competence are closely related to more general messages of dominance, because greater expertise and knowledge facilitate one's ability to control others. Thus, to the extent that faster speech rate indicates higher status, it should result in perceptions of greater dominance as well.

(H2) A speaker will be perceived as more dominant when making a fast request for help than when making a slow request.

Speech accommodation theory also claims that when the speaker's speech rate converges toward the receiver's speech rate it signals that the speaker desires social integration (i.e., desires a relationship with the receiver) or is seeking or providing social approval (Street & Giles, 1982). Messages signaling social integration and social approval are likely to be considered part of general intimacy messages. Thus speech convergence should result in more favorable relational interpretations

on the intimacy dimension. Another relational interpretation related to social integration is immediacy. As defined by Mehrabian (1967, 1969, 1981), immediacy is the psychological distance between relational partners. To the extent that convergence communicates a desire for social integration, convergence should communicate more immediacy.

(H3a) As the speaker's speech rate converges toward the receiver's speech rate, relational interpretations of intimacy increase.

(H3b) As the speaker's speech rate converges toward the receiver's speech rate, relational interpretations of immediacy increase.

It should be noted that Buller and Burgoon did not find a significant decoding ability interaction on immediacy ratings. However, given the focus on speech rate differences and the model's assertion that speech rate convergence signals a desire for integration, it was predicted that convergence will produce perceptions of greater immediacy in this experiment.

The effect of speech rate differences on emotional arousal interpretations is less clear. Mehrabian (1967, 1969, 1981), Burgoon and Hale (1984), and Coker and Burgoon (1987) argue that along with affective and approach judgments, receivers judge the intensity of conversational involvement from changes in nonverbal cues. Involvement perceptions can occur independent of affective and approach judgments. Research on the nonverbal cues of involvement suggest that increased speech rate leads to interpretations of greater involvement and activity. Patterson (1983; Edinger & Patterson, 1983) asserts that more intense paralinguistic cues, including increased rate, signal greater involvement. Cappella (1983, 1985) concludes that rate signals activity or animation. Finally, Coker and Burgoon (1987) report that increased rate is encoded when sources attempt to signal greater involvement. Together, these findings imply that, to the extent that involvement and activity signal emotional arousal, increased rate should increase emotional arousal interpretations. However, the picture is confused by Coker and Burgoon's finding that social anxiety/arousal ratings are negatively related to involvement perceptions. Further, Buller and Burgoon showed that voices rated higher in intimacy also are rated as less aroused. Thus it is not clear whether speech rate will have a consistent linear effect on emotional arousal ratings as suggested by Patterson's, Cappella's, and Coker and Burgoon's findings or will be associated with positive interpretations produced by speech rate convergence as

suggested by Buller and Burgoon's findings. Thus the following research question was posed:

(R1) How will the speaker's speech rate affect the receiver's perceptions of emotional arousal?

The next step is to link the credibility evaluations and relational interpretations to compliance. Unfortunately, speech accommodation theory does not address secondary outcomes, such as compliance, of credibility and relational perceptions. On the one hand, if compliance is mediated by credibility, then it follows from hypothesis one that speech rate should have a main effect on compliance. Bettinghaus and Cody (1987) assert that nonverbal cues that establish the speaker's credibility are relevant when influence is message based, that is a function of the validity of the claim and its supporting evidence. For message-based compliance, as speech rate increases, credibility increases, and produces more compliance.

On the other hand, for some messages compliance may be determined by the valence of the relationship between the speaker and receiver. Bettinghaus and Cody state that when compliance is relationally based, nonverbal cues enhance compliance if they increase the attractiveness of the speaker or the relationship. In these cases, influence occurs because receivers identify with, and desire approval from, attractive speakers and speakers with whom they have attractive relationships.² Hypothesis three suggests that when compliance is relationally based the effect of speech rate on compliance will be mediated by the relational interpretations of intimacy and immediacy produced by convergence. That is, receivers who speak faster will rate a fast speaker as more intimate and immediate and comply more with the fast request, whereas receivers who speak slower will rate a slow speaker as more intimate and immediate and comply more with the slow request.

One appeal in which relationally based influence seems particularly important is a request for help. Burgoon, Buller, and Woodall (in press) argue that establishing an intimate relationship via nonverbal cues increases the likelihood that a receiver will fulfill a request for help, providing the request is legitimate. Several experiments demonstrate that cues that have affiliative or intimate overtones, such as increased gaze (Ellsworth & Langer, 1976; Kleinke, 1977, 1980; Shotland & Johnson, 1978), proximity by a rewarding communicator (Baron, 1978;

Baron & Bell, 1976), touch (Kleinke, 1977, 1980; Patterson, Powell, & Lenihan, 1986; Paulsell & Goldman, 1984; Willis & Hamm, 1980), and physical attractiveness (Bickman, 1971; Chaiken, 1979; Crassweller, Gordon, & Tedford, 1972; Darley & Cooper, 1972; Keasy & Tomlinson-Keasy, 1973; MacNeil & Wilson, 1972; Raymond & Unger, 1972) increase compliance with a request for help. These data are especially relevant, since Hall's, Buller and Burgoon's, and the present compliance message involved a request for help: voluntary participation in academic research. If compliance with requests for help is based on the relationship between the communicator and target, then relational interpretations, such as intimacy and immediacy, not perceptions of credibility, should mediate compliance. Compliance with a request to volunteer for research should be greater when intimacy and immediacy interpretations are more favorable (i.e., more intimate and immediate). Following speech accommodation theory, this will occur when the speaker's speech rate converges toward the receiver's rate. To apply this to the interaction between decoding ability and speech style difference, though, one must assume that good decoders display a different speech style than poor decoders, an assumption that has not been tested. Hall's and Buller and Burgoon's results imply that good decoders comply more with nonverbal cues that in past research have been associated with greater compliance. Poor decoders appear to comply less with these cues. It may be that the nonverbal correlates of compliance are similar to the typical speech styles of good decoders but dissimilar to the typical speech styles of poor decoders. If so, the finding that faster speech rate is correlated with greater compliance (Apple, Streeter, & Krauss, 1979; Bettinghaus & Cody, 1987; Burgoon et al., in press; Miller et al., 1976) suggests that good decoders should manifest a faster speech rate than poor decoders.

(H4) Good decoders will speak faster than poor decoders.

If good and poor decoders display different speech styles, it may explain why decoding ability interacted with the interviewers' voice tone in Buller and Burgoon's study. Namely, good and poor decoders made more favorable relational interpretations of voices that converged toward their own speech styles. In the present experiment, a difference in speech rate between good and poor decoders should produce different intimacy and immediacy interpretations by the two decoding groups. Speech rate convergence should produce the most favorable intimacy and immediacy interpretations, in general. However, for good decoders who generally speak faster, convergence will occur in the fast

condition, while for poor decoders who generally speak slower, convergence will occur in the slow condition. Thus good decoders will rate a fast request more favorably (i.e., more intimate and immediate), whereas poor decoders will rate a slow request more favorably (i.e., more intimate and immediate). On the other hand, good decoders will rate a slow request less favorably and poor decoders will rate a fast request less favorably because these requests diverge from their normal speech rates.

(H5a) Good decoders will rate a fast request as more intimate than a slow request, while poor decoders will rate a slow request as more intimate than a fast request.

(H5b) Good decoders will rate a fast request as more immediate than a slow request, while poor decoders will rate a slow request as more immediate than a fast request.

Given that compliance with a request for help is relationally based, it should increase when a receiver perceives more intimacy and immediacy. From hypothesis five, it follows that compliance by good decoders will be greater with a fast request that they rate as more intimate and immediate, while compliance by poor decoders will be greater with a slow request that they rate as more intimate and immediate.

(H6) Good decoders will comply more with a fast request than with a slow request, while poor decoders will comply more with a slow request than with a fast request.

To triangulate (Cook & Campbell, 1979) on the assumption that compliance with a request for help is relationally based, the extent to which the verbal request made a personal appeal for help was manipulated. If compliance with a request for help is relationally based, then compliance should increase when the verbal message calls attention to this relationship by making a more personal appeal for help.

(H7) Compliance with a more personal verbal appeal will be greater than compliance with a less personal verbal appeal.

METHOD

Participants

Initially, 225 undergraduate students from a large southwestern university were recruited to take part in this two-phase experiment:

however, only 168 participants completed both phases and were included in the analyses. Participation was voluntary and the students received extra credit in their courses.

Speech Rate Pretest

To measure participants' speech rate, one-minute audio recordings of each participant's voice was made, using a studio-quality cassette recorder and microphone. These recordings were made at individual sessions over a three-week period. To obtain a sample of natural speech, each participant was recorded while describing a friend. The middle thirty-second portion of each description (from the 15 sec. mark to the 45 sec. mark in the one-minute description) was transcribed. The middle portion was used in case participants hesitated or had difficulty beginning their description or ran out of things to say near the end of the one-minute period. Measurements of speech rate were taken by counting the number of syllables in the thirty-second portion and doubling this count to obtain a syllable-per-minute estimate. Participants were classified as fast or slow speakers using a median-split technique (median speech rate = 204 syllables/min.). The average speech rate for the fast speakers was 239 syllables/min. and the average speech rate for the slow speakers was 166 syllables/min.

Nonverbal Sensitivity Test

Decoding ability was measured using the 40-item vocal portion of the Profile of Nonverbal Sensitivity (Rosenthal et al., 1979). Good and poor decoding groups were created using a median-split procedure (in the present experiment, median = 25.00 and alpha reliability $r = .22$). These figures are similar to those reported by Buller and Burgoon. The lack of reliability continues to be troubling; however, the issue here is to explain why high scorers make different credibility and relational interpretations and compliance decisions than low scorers. Therefore, in this experiment the ability of the audio PONS to discriminate these two groups is more important than its internal consistency. The issue of unreliability has been discussed in other places (Buller, 1985; Buller & Burgoon, 1986).

Compliance Messages

Four versions of a message requesting participants to volunteer for a bogus mass communication experiment were created. The message

asked participants to volunteer to view up to five half-hour television programs during the term.

The verbal appeals were manipulated to make either a more personal or less personal appeal for volunteers. The more personal appeal highlighted that the experiment was being performed by instructors and students in the department, that the experimenters were in great need of participants, and that several dissertations were dependent on successful completion of the experiment:

The Department of Communication is conducting the third in a series of experiments designed to test hypotheses derived from the uses and gratifications theory of mass media. Our research team is trying to learn more about the impact that mass media has on people such as you, how you search for information in the mass media, and finally, how you use that information in your day-to-day lives. In addition, we are interested in how media messages are distributed by all of us in our everyday interactions.

These studies are being conducted by a group of your instructors and fellow students in the Department of Communication and is funded by a grant from the National Institute of Intercultural Studies. In the end, we will have devoted 3 years to the project, so we have quite a bit of our time invested in this program. In addition, several of our dissertations are dependent on the completion of the project. There are numerous surveys to complete and several small studies to perform so we need as much help from you as possible. We are counting on you to volunteer to serve as subjects for one of the smaller projects.

Should you agree to help us with this experiment, you will view at least one, and if your schedule permits, up to five television programs. After viewing each program, you will complete several instruments that will give us an indication of the specific impact of each show on your beliefs, attitudes, and values.

A sign-up list will be passed among you. Please sign up for as many programs as possible.

The less personal appeal highlighted that the experiment was being conducted by the Communication Sciences Research Group, that the experimental design was complex, and that the results would contribute to the body of knowledge about mass communication:

The Department of Communication is conducting the third in a series of experiments designed to test hypotheses derived from the uses and gratifications theory of mass media. These experiments examine the cognitive impact of mediated messages and information-seeking and

information-using behaviors of media consumers. In addition, the diffusion of information by the media in a multicultural population is a major focus of the entire project.

This research is being conducted by the Communication Sciences Research Group of the University of _____ and is funded by a grant from the National Institute of Intercultural Studies. It is a three-year longitudinal project containing several complex surveys as well as a series of experimental manipulations and requires a large number of subjects. Your participation in a portion of this project would make a significant contribution to this important line of research and eventually to the understanding of mass media's role in contemporary society.

Should you agree to take part in this experiment, you will view at least one, and if your schedule permits, up to five television programs. After viewing each program, you will complete several instruments designed to measure the specific impact of each show on the cognitive variables under investigation.

A sign-up list will be passed among you. Please sign up for as many sessions as possible.

To check this manipulation, a group of 50 undergraduate students who did not participate in the experiment were asked to read the two verbal appeals and rate the personalism of the requests. The message designed as a more personal appeal received significantly higher ratings on this single five-point semantic differential scale ($M = 4.24$) than the message designed to be less personal ($M = 3.20$), $F(1, 48) = 4.49$, $p < .05$, $\omega^2 = .06$. These subjects were also asked to rate the messages on two credibility dimensions. Ratings did not differ significantly on competence, $F(1, 48) = 2.81$, $p > .05$, and sociability/character, $F(1, 48) = 2.32$, $p > .05$.

As an additional manipulation check, experimental participants' relational and credibility ratings of the two appeals were compared. As expected, participants rated the more personal appeal as significantly more intimate ($M = 23.17$), $F(1, 165) = 3.98$, $p < .05$, $\omega^2 = .02$, and less nonimmediate ($M = 24.39$), $F(1, 164) = 4.60$, $p < .05$, $\omega^2 = .02$, than the less personal appeal ($M = 21.23$ and $M = 26.59$, respectively). There were no significant differences in their ratings of dominance, $F(1, 163) = 0.18$, emotional arousal, $F(1, 164) = 3.09$, sociability/character, $F(1, 165) = 2.11$, competence, $F(1, 165) = 0.30$, composure, $F(1, 165) = 2.44$, and extraversion, $F(1, 165) = 0.00$.

The two messages were recorded by a male confederate who had

extensive training in oral interpretation techniques and professional experience creating radio and television voice-overs. Recordings were made at two speeds, using the studio-quality cassette recorder and microphone. The slow version was recorded at 154 syllables/min. and the fast version was recorded at 352 syllables/min. Selection of these speeds was made prior to measuring the participants' speech rates and was guided by the experimental speech rates employed by Street and Brady (1982). These authors reported little difference between their three fastest rates—253, 324, and 376 syllables/min.—however, Street and Brady concluded that the fastest rate (376) was unacceptably fast. Therefore, the fast request in the present experiment was designed to approximate the fastest acceptable rate in Street and Brady's experiment. The slow request was designed to approximate Street and Brady's slowest acceptable rate. Their two slow rates were 140 and 197 syllables/min; however, Street and Brady felt 140 syllables/min. was unacceptably slow. To check that the difference in rates would be perceptible, a group of 64 students who did not take part in the experiment evaluated the speech rate of the messages on a 7-point Semantic Differential scale (fast-slow). In total, 32 rated the slow relational and fast task messages and 32 rated the slow task and fast relational messages. The slow messages were evaluated as significantly slower ($M = 2.06$, $sd = 0.83$) than the fast messages ($M = 6.06$, $sd = 0.71$), pairwise $t(63) = 32.26$, $p < .05$.

Credibility and

Relational Message Posttest

A 15-item semantic differential scale designed by McCroskey (McCroskey et al., 1973; McCroskey et al., 1974) was used to measure the speaker's credibility following the request. Four credibility dimensions were created, following Buller and Burgoon: sociability/character (alpha reliability $r = .85$), competence ($r = .77$), composure ($r = .76$), and extraversion ($r = .75$).

Burgoon and Hale's (1987) 24-item relational messages scale assessed the respondents' perceptions of the speakers' implicit verbal and nonverbal messages about the nature of their interpersonal relationship. The scale measures four general relational themes (Burgoon & Hale, 1984): emotional arousal/composure/formality $r = .65$, intimacy $r = .77$, nonimmediacy $r = .77$, and dominance/submission $r = .75$.

Procedure

Participants were recruited for an experiment investigating the link between a person's nonverbal sensitivity and her or his vocalic patterns. Participants were informed that the experiment would require two sessions outside of class. Initially, participants signed up for individual sessions to record their voices. Recruitment was performed via a tape-recorded message that described the purpose of the experiment and the tasks required of the participants. The male confederate who encoded the experimental compliance messages also encoded the recruiting message. This message was tape-recorded at 244 syllables/min. The use of the tape-recorded recruiting message set a precedent for the experimental message that participants would be exposed to in the later group sessions. As previously described, the experimental message requested participants to take part in a fictitious media experiment.

After obtaining measures of their speech rate, participants were assigned to four experimental groups so that each group contained approximately equal numbers of fast and slow speaking participants. The participants were requested to come to their assigned group session to take the nonverbal sensitivity test. Any problems with this assignment were handled so as to maintain approximately equal numbers of fast and slow speaking participants in each group.

The nonverbal sensitivity test was administered to each experimental group in a classroom. After the participants had arrived, the experimenter (*E*) began the group session by explaining that the participants would be completing a test of their sensitivity to nonverbal cues. Following this introduction, the *E* went to a table at the side of the room to get the test forms the participants would need. Actually, these were the test booklets containing the posttest measures of speaker credibility and relational messages. The *E* announced to the participants that these were not the correct test forms for the nonverbal sensitivity test and asked an experimental assistant to go to the *E*'s office and get the correct test forms.

After the assistant left the room, the *E* told the participants that the *E* had been asked to recruit them for another experiment, and since they had to wait for the correct test forms, the *E* would play the recruiting tape prior to the nonverbal sensitivity test. The *E* then presented the experimental recruiting message, using a Sony stereo cassette player/re-

order. Each of the four experimental groups heard one of the four experimental messages. Following the experimental message, the *E* distributed the posttest booklets containing the credibility and relational message measures. Attached to the front of this booklet was a sheet on which participants were to indicate whether they volunteered to participate in the bogus experiment, and if so how many television programs they would volunteer to watch. Participants could volunteer for up to five television programs; this was the dependent measure of compliance. As a cover story for the credibility and relational message questions, the *E* told the participants that the tape-recorded recruitment messages were a new departmental method of recruiting research participants and the department was interested in students' reactions to the new method. The *E* asked participants to respond to the credibility and relational message questions to provide the department with information on whether to continue using the new method.

While on theoretical grounds, interpretations of vocal cues occur before compliance decisions, these interpretations were measured following the compliance measure for two reasons. First, assessing the vocal interpretations prior to compliance might influence the vocal interpretations and their link to compliance by making some interpretations more salient than they actually were in the compliance decision. Second, if participants were asked to judge the credibility and relational aspects of the message prior to signing up for the fictitious experiment, the participants might realize that this message was not an actual recruiting message but rather an experimental manipulation.

While the participants were completing the posttest, the assistant returned with the nonverbal sensitivity test forms. After all the participants had completed the posttest, the *E* distributed the nonverbal sensitivity test forms and administered the audio PONS.

Statistical Analysis

Hypothesis one concerning credibility evaluations was tested by subjecting the four credibility dimensions to a 2 (receiver's speech rate) \times 2 (receiver's decoding ability) \times 2 (speaker's speech rate) factorial analysis of variance (ANOVA).⁴ Hypothesis two was tested by subjecting dominance interpretations to a similar 2 \times 2 \times 2 factorial ANOVA. The remaining three relational interpretations—intimacy, nonimmediacy, and emotional arousal—were also subjected to a 2 (receiver's rate) \times 2

(decoding ability) \times 2 (speaker's rate) factorial ANOVA. In these analyses, the interaction between receiver's rate and speaker's rate tested hypothesis three, concerning convergence effects on intimacy and immediacy interpretations, and research question one, concerning convergence effects on emotional arousal interpretations. The interaction between receiver's decoding ability and speaker's rate tested hypothesis six on intimacy and immediacy ratings. Hypothesis four, which contained the critical assumption that good and poor decoders would vary in speech rate, was tested in three ways: (1) a one-way ANOVA on the continuous measure of receiver's speech rate employing a median-split on decoding ability, (2) a one-way ANOVA employing an upper and lower quartile split on decoding ability, and (3) a Pearson Product-Moment correlation between the continuous measure of decoding ability and receiver's speech rate. The interaction between decoding ability and speaker's speech rate on compliance predicted by hypothesis five was tested by a 2 (receiver's rate) \times 2 (decoding ability) \times 2 (speaker's rate) factorial ANOVA on the number of programs participants volunteered to view. Finally, hypothesis seven, which triangulated on the assumption that compliance with requests for help is relationally based, was tested using a one-way ANOVA (task versus relational appeal) on the number of programs participants volunteered to view.

RESULTS

Hypothesis One

Hypothesis one predicted that a speaker would be perceived as more credible when making a fast request than when making a slow request. Support for this hypothesis was mixed. The speaker was rated as higher in sociability/character in the fast condition ($M = 26.59$, $sd = 6.39$) than in the slow condition ($M = 24.12$, $sd = 5.92$), $F(1, 155) = 6.24$, $p < .05$, $\omega^2 = .04$. Neither the receiver's speech rate, $F(1, 155) = .12$, nor decoding ability, $F(1, 155) = .31$ had a significant main effect on sociability/character. The interactions among these three variables also were nonsignificant: receiver's rate \times decoding ability, $F(1, 155) = .25$, receiver's rate \times speaker's rate, $F(1, 155) = 2.56$, $p > .05$, decoding ability \times speaker's rate, $F(1, 155) = 2.24$, $p > .05$, and receiver's rate \times decoding ability \times speaker's rate, $F(1, 155) = .00$.

The speaker was also considered more extraverted in the fast

condition ($M = 16.13$, $sd = 3.35$) than in the slow condition ($M = 14.57$, $sd = 3.28$), $F(1, 155) = 9.02$, $p < .05$, $\omega^2 = .05$. The main effects for receiver's rate, $F(1, 155) = .24$, and decoding ability, $F(1, 155) = 1.00$, were not significant, nor were the interactions among the three variables: receiver's rate \times decoding ability, $F(1, 155) = .33$, receiver's rate \times speaker's rate, $F(1, 155) = .02$, decoding ability \times speaker's rate, $F(1, 155) = .94$, and receiver's rate \times decoding ability \times speaker's rate, $F(1, 155) = .45$.

Contrary to hypothesis one, though, ratings on competence and composure did not differ significantly given the speaker's rate (competence $F(1, 155) = 1.15$, $p > .05$, composure $F(1, 155) = .06$, $p > .05$). There were also no significant main effects for receiver's rate (competence $F(1, 155) = .00$, composure $F(1, 155) = .25$) or decoding ability (competence $F(1, 155) = .69$, composure $F(1, 155) = .60$). The interactions among the three independent variables were nonsignificant as well: receiver's rate \times decoding ability on competence $F(1, 155) = .44$ and composure $F(1, 155) = 3.00$, $p > .05$, receiver's rate \times speaker's rate on competence $F(1, 155) = .01$ and composure $F(1, 155) = .06$, decoding ability \times speaker's rate on competence $F(1, 155) = .02$ and composure $F(1, 155) = .02$, and receiver's rate \times decoding ability \times speaker's rate on competence $F(1, 155) = .03$ and composure $F(1, 155) = .06$.

Hypothesis Two

Hypothesis two predicted that a speaker would be perceived as more dominant when making a fast request than when making a slow request. This hypothesis was supported. The speaker in the fast condition was seen as more dominant ($M = 28.65$, $sd = 5.40$) than in the slow condition ($M = 26.70$, $sd = 5.47$), $F(1, 153) = 5.20$, $p < .05$, $\omega^2 = .03$. Neither the receiver's rate, $F(1, 153) = .32$, nor the receiver's decoding ability, $F(1, 153) = .58$, had a significant main effect on dominance perceptions. The interactions among the three variables also were not significant: receiver's rate \times decoding ability, $F(1, 153) = .50$, receiver's rate \times speaker's rate, $F(1, 153) = .02$, decoding ability \times speaker's rate, $F(1, 153) = .43$, and receiver's rate \times decoding ability \times speaker's rate, $F(1, 153) = .02$.

Hypothesis Three

Hypothesis three predicted that as the speaker's speech rate converged toward the receiver's speech rate, relational interpretations

of intimacy and immediacy would increase. This hypothesis was not supported. The predicted interaction between the receiver's speech rate and the speaker's rate was not significant for intimacy, $F(1, 154) = 1.05, p > .05$, or nonimmediacy interpretations, $F(1, 154) = 3.08, p > .05$. There were no significant main effects for receiver's speech rate on intimacy $F(1, 154) = .03$ and nonimmediacy $F(1, 154) = .06$, and the speaker's rate on intimacy $F(1, 154) = 1.30$. There was, however, a main effect for speaker's rate on nonimmediacy ratings, $F(1, 154) = 6.13, p < .05$. While the speaker was seen as more nonimmediate in the slow condition (fast $M = 24.08$, slow $M = 26.67$), this main effect was overridden by a disordinal interaction between speaker's rate and decoding ability to be reported later.

Research Question One

There was a main effect for speaker's rate on emotional arousal interpretations, $F(1, 154) = 4.26, p < .05, \omega^2 = .02$. Faster requests were interpreted as less aroused ($M = 19.15, sd = 5.86$) than slower requests ($M = 21.15, sd = 5.83$). There was no evidence of a convergence effect in emotional arousal ratings. The speaker's speech rate did not significantly interact with the receiver's rate on arousal ratings, $F(1, 154) = 0.84, p > .05$. Also, there was no significant main effect for receiver's rate on emotional arousal interpretations, $F(1, 154) = 1.72, p > .05$.

Hypothesis Four

Hypothesis four tested the assumption that good decoders speak faster than poor decoders. Support for this hypothesis was critical for applying speech accommodation theory to the interactions between the receiver's decoding ability and the speaker's speech rate on relational interpretations and compliance. Good decoders ($M = 210.75$ syllables/min.) tended to speak faster than poor decoders ($M = 197.81$ syllables/min.), $F(1, 161) = 3.13, p = .08$. Since the ANOVA only approached significance, two additional tests were performed based on the concern that a median split was not the most sensitive method of testing this hypothesis. First, the speech rates of decoders who made up the upper and lower quartiles of decoding ability were compared. Essentially the same mean speech rates emerged in this analysis (upper quartile $M = 211.45$ syllables/min., lower quartile $M = 196.43$ syllables/min.), but given the lower N the difference was not significant,

$F(1, 100) = 2.42, p > .05$. Second, a Pearson Product-Moment correlation was calculated between the continuous measure of decoding ability and continuous measure of speech rate. This correlation was significant and showed that as the receiver's sensitivity to nonverbal cues increased, the receiver's speech rate increased, $r(163) = .14, p < .05$. Thus it appears that good decoders have a consistently higher speech rate than poor decoders, supporting hypothesis four, however, this difference is small at best.

Hypothesis Five

Given support for hypothesis four, hypothesis five predicted that good decoders, who in general spoke faster, would rate a fast request as more intimate and immediate, whereas poor decoders, who in general spoke slower, would rate a slow request as more intimate and immediate. Hypothesis five was supported.

The means and residuals in Table 1 show that good decoders rated the fast request as more intimate than the slow request, whereas poor decoders rated the fast request as less intimate than the slow request, $F(1, 155) = 5.53, p < .05, \omega^2 = .03$. Similarly, good decoders rated the fast request as less nonimmediate than the slow request, while poor decoders rated the fast request as more nonimmediate than the slow request, $F(1, 154) = 5.55, p < .05, \omega^2 = .03$.

There were no significant main effects for decoding ability on intimacy, $F(1, 154) = .39$, and nonimmediacy interpretations, $F(1, 154) = 3.48, p > .05$. Also, decoding ability did not interact significantly with receiver's rate on either intimacy, $F(1, 154) = 1.24$, or nonimmediacy evaluations, $F(1, 154) = 1.68$. Finally, the three-way interaction between decoding ability, receiver's rate, and speaker's rate was not significant on intimacy, $F(1, 154) = .97$, or nonimmediacy, $F(1, 154) = 2.32, p > .05$.

To replicate Buller and Burgoon's analysis, the interaction between the receiver's decoding ability and the speaker's speech rate on arousal interpretations also was examined, even though speech accommodation theory did not predict it would occur. This interaction was not significant, $F(1, 154) = 1.79, p > .05$. Also, there was no main effect for decoding ability on arousal perceptions, $F(1, 154) = 3.36, p > .05$. Decoding ability, though, did interact significantly with the receiver's speech rate, $F(1, 154) = 4.88, p < .05, \omega^2 = .02$, such that fast speaking good decoders perceived more arousal in the speaker's message than slow speaking good decoders whereas fast speaking poor

TABLE 1
Means, Standard Deviations, and Residuals for
Arousal, Intimacy, and Immediacy Scores

Participant's Evaluations	Speaker's Speech Rate		Total
	Slow	Fast	
Intimacy			
Means ^a			
Poor decoders	22.91a sd = 5.17 (45)	22.06a sd = 6.36 (48)	22.47 sd = 5.82 (93)
Good decoders	20.18a sd = 7.28 (38)	23.84a sd = 6.47 (32)	21.86 sd = 7.13 (70)
Total	21.66 sd = 6.24 (83)	22.78 sd = 6.42 (80)	22.21 sd = 6.33 (163)
Residuals ^b			
Poor decoders	.99	-.98	
Good decoders	-1.13	1.41	
Nonimmediacy			
Means ^a			
Poor decoders	24.82b sd = 5.60 (45)	24.21b sd = 6.78 (48)	24.51 sd = 6.29 (93)
Good decoders	28.92a sd = 6.13 (37)	23.88b sd = 7.46 (32)	26.58 sd = 7.18 (69)
Total	26.67 sd = 6.02 (82)	24.08 sd = 7.01 (80)	25.39 sd = 6.70 (162)
Residuals ^b			
Poor decoders	-.28	1.01	
Good decoders	1.06	-1.39	

(continued)

decoders perceived less arousal in the speaker's message than slow speaking poor decoders (Table 1). The three-way interaction among receiver's rate, decoding ability, and speaker's rate was not significant, $F(1, 154) = .65$.

Hypothesis Six

Hypothesis six predicted an interaction between the receiver's decoding ability and speaker's speech rate on compliance with the

TABLE 1 Continued

Participant's Evaluations	Receiver's Speech Rate		Total
	Slow	Fast	
Emotional Arousal			
Means ^a			
Poor decoders	20.74ab sd = 5.38 (51)	18.00a sd = 5.50 (42)	19.50 sd = 5.57 (93)
Good decoders	20.60ab sd = 6.63 (37)	21.56b sd = 6.21 (32)	21.14 sd = 6.37 (69)
Total	20.69 sd = 5.76 (81)	19.71 sd = 6.05 (81)	20.20 sd = 5.96 (162)
Residuals ^b			
Poor decoders	.91	-1.03	
Good decoders	-1.01	.75	

NOTE: Cell sizes are in parentheses.

a. Means with different letters were significantly different in Student-Newman-Keuls post hoc test.

b. Residuals were calculated following Keppel (1982, p. 189).

request for research participation. This hypothesis was supported. A disordinal interaction between decoding ability and speaker rate emerged. Good decoders complied more with the fast request than with the slow request, but poor decoders complied more with the slow request than with the fast request, $F(1, 155) = 4.05, p < .05, \omega^2 = .01$ (Table 2). There were no significant main effects for receiver's rate, $F(1, 155) = .03$, speaker's rate, $F(1, 155) = 3.08, p > .05$, and decoding ability, $F(1, 155) = .00$. In addition, receiver's rate did not significantly interact with speaker's rate, $F(1, 155) = .12$, or decoding ability, $F(1, 155) = 1.99$. The three-way interaction between the independent variables was not significant, $F(1, 155) = .50$.

Hypothesis Seven

The last hypothesis was designed to triangulate on the assumption that compliance with a request for help, such as volunteering to participate in academic research, follows an identification process in which compliance is based on the relationship between the speaker and the receiver. Hypothesis seven predicted that receivers would comply more with a message that made a greater personal verbal appeal for help than with a message that made a less personal verbal appeal. While

TABLE 2
Compliance

	Speaker's Speech Rate		
	Slow	Fast	Total
Means ^a			
Poor decoders	1.44ab	1.46ab	1.45
	sd = 1.85 (45)	sd = 1.53 (48)	sd = 1.68 (93)
Good decoders	0.95b	1.97a	1.41
	sd = 1.37 (38)	sd = 1.62 (32)	sd = 1.57 (70)
Total	1.22	1.66	1.44
	sd = 1.62 (83)	sd = 1.57 (80)	sd = 1.63 (163)
Residuals ^b			
Poor decoders	.21	-.21	
Good decoders	-.24	.34	

NOTE: Cell sizes are in parentheses.

a. Means with different letters were significantly different in Student-Newman-Keuls post hoc test.

b. Residuals were calculated following Keppel (1982, p. 189).

the means were in the hypothesized direction (more personal appeal $M = 1.60$, $sd = 1.74$, less personal appeal $M = 1.24$, $sd = 1.45$), the main effect for message type was not significant, $F(1, 165) = 2.03$, $p > .05$.

DISCUSSION

This experiment tested a speech accommodation explanation for the interaction between a receiver's decoding ability and a speaker's voice tone on compliance observed by Hall (1980) and Buller and Burgoon (1986). Speech accommodation theory holds that a receiver interprets changes in a speaker's vocal pattern vis-à-vis the receiver's own vocal pattern. That is, a receiver assesses whether the vocal changes converge, diverge, or maintain a certain disparity from her or his speech style. Convergence generally results in positive relational interpretations, such as greater intimacy, social integration, and social approval. Divergence, in contrast, is generally interpreted as relationally unfavorable. However, the model also recognizes that some vocal changes produce consistent interpretations across receivers due to the relationship between these changes and speech stereotypes or norma-

tive standards. In applying the model to the interaction between decoding ability and voice tone, two predictions were made. First, it was predicted that decoders who scored high on the audio PONS would manifest a different speech style than decoders who scored low on the test. In this experiment, it was predicted that good decoders would speak faster than poor decoders. This speech style difference should produce conflicting relational interpretations about a speaker making fast and slow requests for help. Good decoders should find the convergent faster request more intimate and immediate, while poor decoders should find the convergent slower request more intimate and immediate. At the same time, both good and poor decoders should evaluate the speaker in the fast condition as more credible and dominant than in the slow condition based on the general association of competence with faster speech rate. The second prediction was that compliance with a request for help is relationally based, where the quality of the relationship between the speaker and receiver determines compliance, rather than message based, where receivers weigh the merit of each appeal and comply as a result of attitude change. Given the former process, the relational interpretations of intimacy and immediacy assigned to the request for help should take on greater importance than credibility evaluations that have implications for the validity of the appeals. Decoders should comply more with requests to which they assign positive relational meanings. That is, good decoders should comply more with a fast request, but poor decoders should comply more with a slow request.

The results of the experiment support this explanation. First, as predicted, good and poor decoders displayed different speech rates. Good decoders in general spoke faster than poor decoders. Further, decoders' interpretations of intimacy and immediacy in the fast and slow requests confirmed the hypothesis that good and poor decoders would assign the most positive relational meanings to the requests that converged toward their respective speech rates. Good decoders rated the fast request as more intimate and immediate than the slow request. Poor decoders rated the slow request as more intimate and immediate than the fast request.

Support for the explanation that differences in relational interpretations by good and poor decoders is a function of convergence and divergence between the speaker's speech rate and the decoder's rate must be tempered somewhat. First, the difference in speech rate

between good and poor decoders, while present, was not very large. Second, contrary to hypothesis two, convergence in general did not lead to increased intimacy and immediacy ratings. One possible explanation for this lack of support is that perceived convergence and divergence was greater in magnitude than the actual convergence and divergence used to test hypothesis two. The results of several previous experiments suggest that receivers possess latitudes of acceptable speech rate around their own speech rate. These latitudes are considered the receiver's performance zone. Small to moderate differences in speech rate that remain within the performance zone are interpreted as equally favorable by the receiver. Only when speech rate differences move outside the zone do the receiver's perceptions of the speaker change (Giles, 1980; Street, 1982; Street & Brady, 1982; Street & Giles, 1982). It may be that along with distorting relational interpretations of speech rate differences, performance zones also distort the perceived difference between the speaker's speech rate and the receiver's rate. A speech rate that exists within the performance zone may be perceived to be more convergent with the receiver's own rate, while a speech rate that exists outside the performance zone may be perceived to be more divergent from the receiver's rate than an objective measure would imply. Such a distortion would result in greater convergence and greater divergence perceptually than occurred in actuality. The difference among perceived and actual convergence and divergence may account for the lack of an actual convergence effect in this study and the presence of an apparent convergence effect in the decoding ability interaction. Good decoders may have perceived greater convergence by the fast request and more divergence by the slow request, whereas poor decoders may have perceived exactly the opposite. The greater perceived convergence and divergence produced the decoding ability interaction, even though actual convergence was not of sufficient magnitude to support hypothesis two. Unfortunately, there was no direct measure of the speaker's perceived speech rate or the speaker's perceived similarity in speech rate, therefore, this speculation cannot be tested in this experiment.

Another plausible explanation for the presence of the decoding ability interaction without actual convergence effects is that good and poor decoders may differ more in their speech style preferences than in their actual speech styles. That is, good decoders may prefer to process speech at a faster pace than poor decoders, therefore, they respond

more favorably to faster presentations. They may also incorporate faster rates within their own speech styles, but it is the preference for a particular style that moderates decoders' responses to changes in speech rate not the decoders' actual speech rate. In this explanation, then, the correlation between speech rate and decoding ability, while expected, may not be strong. Further, convergence toward the decoders' actual speech rates may be less important than convergence toward the decoders' speech style preferences reflected in their decoding ability.

A third possibility is that both the receiver's speech style and speech style preferences determine evaluations of vocal changes. A puzzling finding in this study was the interaction between the receiver's decoding ability and the receiver's speech rate on emotional arousal interpretations. What is most intriguing about this interaction is that higher arousal ratings were provided by those receivers whose speech rates matched the speech rate preferences associated with their decoding ability. That is, faster speaking good decoders and slower speaking poor decoders attributed more arousal to speakers than slower speaking good decoders and faster speaking poor decoders. It may be that when actual speech style matches speech style preferences the performance zone of acceptable speech style is restricted. Given a restricted performance zone, a diverging style is seen as more aroused. Conversely, when actual speech style does not match speech style preferences, the performance zone expands and the receiver has a greater tolerance for a diverging style. This tolerance reduces the emotional arousal evaluations assigned to the diverging style. Thus when their interpretations of fast and slow messages are combined, faster speaking good decoders' and slower speaking poor decoders' arousal attributions were higher than slower speaking good decoders' and faster speaking poor decoders' arousal attributions because the former two groups found diverging styles more arousing. It should be noted, though, that this explanation would predict a three-way interaction among the receiver's rate, decoding ability, and speaker's rate. This interaction did not emerge; however, the link between actual speech style, speech style preferences, and performance zones merits further research attention.

Speech accommodation theory's claim that some interpretations of vocal behavior are based on normative standards received support. Both good and poor decoders, as hypothesized, saw the fast request as

more credible and dominant than the slow request. Buller and Burgoon also found that credibility and dominance ratings were consistent across decoding groups; thus it seems safe to conclude that credibility and status evaluations are based on decoders' general speech stereotypes rather than on their speech styles.

It should be noted that, contrary to prior research, the fast request did not elicit higher ratings of competence than did the slow request. However, it was assumed that receivers' reactions to requests are relationally based rather than message based. In a relationally based process, credibility dimensions may be salient only insofar as they relate to interpersonal trust, friendliness, and ability to communicate (i.e., character/sociability, extraversion). Competence, therefore, may be less important in relationally based compliance than in message-based compliance.

The second prediction critical to the application of speech accommodation theory was that compliance with a request for help followed an identification process in which relational interpretations carried more weight than credibility evaluations. Consistent with this prediction, compliance by good and poor decoders paralleled their intimacy and immediacy interpretations of the fast and slow requests. Good decoders complied more with the fast request, which they interpreted as more intimate and immediate, than with the slow request, which they interpreted as less intimate and immediate. Similarly, poor decoders complied more with the slow request, which they saw as more intimate and immediate, than with the fast request, which they saw as less intimate and immediate. Relational interpretations seem to play a greater role in compliance decisions than credibility evaluations and their effect on requests for help seems robust. They appear to affect compliance with this type of request both when general voice tone changes occur and when a single vocal cue differs.

Unfortunately, the manipulation of the verbal appeal designed to triangulate on the relationally based compliance process was unsuccessful. The message designed to make a more personal appeal, while considered more intimate and immediate, did not receive significantly greater compliance than the less personal appeal, which was considered less intimate and immediate. However, the compliance means for the two messages were in the predicted direction. It may be that any request for help carries relational overtones, so even the less personal appeal established a relationship sufficient to produce compliance. A

better test of hypothesis seven may require contrasting a request for help with an appeal designed to change attitudes as a means of gaining compliance. In the former, relational interpretations should carry more weight, while in the latter credibility judgments should be more salient. Thus it is inappropriate to dismiss identification as the underlying mechanism in this experiment simply because the verbal appeal manipulation failed to achieve significantly different compliance rates. The parallel between the compliance pattern and the pattern of intimacy and immediacy interpretations strongly implies that relational interpretations played a substantial role in receivers' decisions to comply with the request for help.

In sum, speech accommodation theory provides an explanation for the differences in relational interpretations and compliance by good and poor decoders in response to changes in vocalic cues, particularly speech rate. However, additional research is needed on two issues before completely accepting the speech accommodation explanation. First, further comparisons of good and poor decoders' speech styles are warranted. Street and Brady (1982) argue that speech rate is not always the most important vocal difference, and other research in the speech accommodation area has demonstrated differences between receivers in pause duration (Jaffe & Feldstein, 1970; Street, 1984; Welkowitz & Feldstein, 1969), response latency (Street, 1982), interaction length (Stang, 1973), and overall accent (Giles, 1973; Ryan, 1979; Thakerar & Giles, 1981). Second, performance zones or latitudes of tolerance for speech rate should be compared between good and poor decoders, to test the earlier speculation that good decoders' performance zones contain generally faster rates than poor decoders' performance zones. Further, the effect of performance zones on perceived convergence and divergence should be investigated to see whether, as speculated, rates that fall within performance zones are perceived to be more convergent and rates that fall outside performance zones are perceived to be more divergent than they actually are.

Finally, the results have implications for the audio PONS. The current results reinforce Buller and Burgoon's argument that good and poor decoders are equally sensitive to changes in vocalic cues and that the audio PONS, instead, discriminates receivers on the meanings they assign to these changes. Thus it seems that the audio PONS may be primarily a test of a person's method of interpreting vocalic changes, although a person must have the ability to recognize a vocal change in

order to interpret it. Additional research should examine the differences between good and poor decoders' speech style preferences as well as the implications of the speech accommodation phenomenon for this test. One important question concerns the method by which decoders assign dominance and pleasantness ratings, the two dimensions that the PONS is designed to measure. Speech accommodation theory suggests that dominance interpretations are a function of normative standards, whereas pleasantness interpretations, which plausibly are related to intimacy and social approval, are a function of decoders' speech style preferences. Thus it may be that the audio PONS items are measuring two different interpretative processes, a possibility that merits attention.

NOTES

1. As in Buller and Burgoon (1986), *good decoder* indicates a person who scores above the median score on the audio portion of the Profile of Nonverbal Sensitivity (PONS) and *poor decoder* indicates a person who scores below the median score on this test. The PONS (Rosenthal et al., 1979) is the most commonly used test of nonverbal sensitivity. The format consists of presenting short segments of kinesic and vocalic nonverbal behavior to respondents who attempt to match the behavior with the situation in which it was encoded. The items are designed to measure respondents' ability to decode nonverbal behavior along two continua: pleasant-unpleasant and dominant-submissive. The vocalic portion of the PONS contains 40 vocalic segments filtered so that the verbal content is not recognizable.

2. Bettinghaus and Cody (1987) are not the first authors to distinguish between message-based influence and relationally based influence. Kelman (1958), French and Raven (1968), and Tedeschi and Bonoma (1972) distinguish between influence due to the informational or logical value of the message and influence due to the quality of the relationship between the speaker and receiver.

3. Low scores on the nonimmediacy scale indicate more immediacy, high scores indicate less immediacy.

4. The classical experimental procedure that assumes equal cell sizes was employed in the analysis of variance. Cell sizes, though unequal, were (1) proportional to the marginal frequencies and (2) resulted from factors independent of the experimental manipulation. Further, the sum of the sums of squares for each effect deviated only slightly from the total sum of squares for effects. This indicated the assumption of orthogonality was maintained (Winer, 1971).

REFERENCES

Apple, W., Streeter L.A., & Krauss R. M. (1979). Effects of pitch and speech rate on personal attributions. *Journal of Personality and Social Psychology*, 37, 715-727.

- Baron, R. A. (1978). Invasions of personal space and helping: Mediating effects of invader's apparent need. *Journal of Experimental Social Psychology*, 14, 304-312.
- Baron, R. A., & Bell, P. A. (1976). Physical distance and helping: Some unexpected benefits of "crowding in" on others. *Journal of Applied Social Psychology*, 6, 95-104.
- Bickman, L. (1971). The effect of social status on the honesty of others. *Journal of Social Psychology*, 85, 87-92.
- Bettinghaus, E. P., & Cody, M. J. (1987). *Persuasive communication*. New York: Holt, Rinehart, & Winston.
- Buller, D. B. (1985). *The reliability of the audio portion of the profile of nonverbal sensitivity: A research note*. Presented to the annual meeting of the Speech Communication Association, Denver.
- Buller, D. B., & Burgoon, J. K. (1986). The effects of vocalics and nonverbal sensitivity on compliance: A replication and extension. *Human Communication Research*, 13, 126-144.
- Burgoon, J. K. (1978). Further explication and an initial test of the theory of violations of personal space expectations. *Human Communication Research*, 4, 129-142.
- Burgoon, J. K. (1983). Nonverbal violations of expectations. In J. M. Wiemann & R. P. Harrison (Eds.), *Nonverbal interaction* (pp. 77-111). Beverly Hills, CA: Sage.
- Burgoon, J. K. (1985). *Expectancies, rewards, violations and outcomes*. Paper presented at the annual meeting of the International Communication Association, Honolulu.
- Burgoon, J. K., Buller, D. B., & Woodall, W. G. (in press). *Introduction to nonverbal communication*. New York: Harper & Row.
- Burgoon, J. K., Coker, D. A., & Coker, R. A. (1986). A test of two contrasting explanations of the communicative effects of gaze behavior. *Human Communication Research*, 12, 495-524.
- Burgoon, J. K., & Hale, J. L. (1984). The fundamental topoi of relational communication. *Communication Monographs*, 51, 193-214.
- Burgoon, J. K., & Hale, J. L. (1987). Validation and measurement of the fundamental themes of relational communication. *Communication Monographs*, 54, 19-41.
- Burgoon, J. K., & Jones, S. B. (1976). Toward a theory of personal space expectations and their violations. *Human Communication Research*, 2, 131-146.
- Burgoon, J. K., Stacks, D. W., & Woodall, W. G. (1979). A communicative model of violations of distancing expectations: Further tests and a critique. *Western Journal of Speech Communication*, 43, 153-167.
- Cappella, J. N. (1983). Conversational involvement: Approaching and avoiding others. In J. M. Wiemann & R. P. Harrison (Eds.), *Nonverbal interaction* (pp. 113-148). Beverly Hills, CA: Sage.
- Cappella, J. N. (1985). Controlling the floor in conversation. In A. W. Siegman & S. Feldstein (Eds.), *Multichannel integrations of nonverbal behavior* (pp. 37-68). Hillsdale, NJ: Erlbaum.
- Chaiken, S. (1979). Communicator physical attractiveness and persuasion. *Journal of Personality and Social Psychology*, 37, 1387-1397.
- Coker, D. A., & Burgoon, J. K. (1987). The nature of conversational involvement and nonverbal encoding patterns. *Human Communication Research*, 13, 463-494.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Chicago: Rand McNally.

- Crassweller, P., Gordon, M. A., & Tedford, W. H., Jr. (1972). An experimental investigation of hitchhiking. *Journal of Psychology*, 82, 43-47.
- Darley, J. M., & Cooper, J. (1972). The "clean for Gene" phenomenon: The effect of students' appearance on political campaigning. *Journal of Applied Social Psychology*, 2, 24-33.
- Edinger, J. A., & Patterson, M. L. (1983). Nonverbal involvement and social control. *Psychological Bulletin*, 93, 30-56.
- Ellsworth, P. C., & Langer, E. J. (1976). Staring and approach: An interpretation of the stare as a nonspecific activator. *Journal of Personality and Social Psychology*, 33, 117-122.
- French, J., & Raven, B. (1968). The bases of social power. In D. Cartwright & A. Zander (Eds.), *Group dynamics* (3rd ed., pp. 259-269). New York: Harper & Row.
- Giles, H. (1973). Accent mobility: A model and some data. *Anthropological Linguistics*, 15, 87-105.
- Giles, H. (1980). Accommodation theory: Some new directions. In S. de Silva (Ed.), *Aspects of linguistic behavior* (pp. 105-136). York: University of York Press.
- Gundersen, D., & Hopper, R. (1976). Relationship between speech delivery and speech effectiveness. *Communication Monographs*, 43, 158-165.
- Hall, J. A. (1980). Voice tone and persuasion. *Journal of Personality and Social Psychology*, 36, 924-934.
- Jaffe, J., & Feldstein, S. (1970). *Rhythms of dialogue*. London: Academic Press.
- Keasy, C. B., & Tomlinson-Keasy, C. (1973). Petition signing in a naturalistic setting. *Journal of Social Psychology*, 89, 313-314.
- Kelman, H. D. (1958). Compliance, identification, and internalization through processes of opinion change. *Journal of Conflict Resolution*, 2, 51-60.
- Keppel, G. (1982). *Design and analysis: A researcher's handbook*. Englewood Cliffs, NJ: Prentice-Hall.
- Kleinke, C. L. (1977). Compliance to requests made by gazing and touching experimenters in field settings. *Journal of Experimental Social Psychology*, 13, 218-223.
- Kleinke, C. L. (1980). Interaction between gaze and legitimacy of request on compliance in a field setting. *Journal of Nonverbal Behavior*, 5, 3-12.
- MacNeil, L., & Wilson, B. (1972). *Effects of clothing and hair length on petition signing behavior*. Unpublished manuscript, Illinois State University.
- McCroskey, J. C., Hamilton, P. R., & Weiner, A. N. (1974). The effect of interaction behavior on source credibility, homophily, and interpersonal attraction. *Human Communication Research*, 1, 42-52.
- McCroskey, J. C., Jensen, T., & Valencia, C. (1973). *The measurement of the credibility of peers and spouses*. Paper presented at the annual meeting of the International Communication Association, Montreal.
- Mehrabian, A. (1967). Attitudes inferred from non-immediacy of verbal communications. *Journal of Verbal Learning and Verbal Behavior*, 6, 294-295.
- Mehrabian, A. (1969). Methods and design: Some referents and measures of nonverbal behavior. *Behavior Research Methods and Instruments*, 1, 203-207.
- Mehrabian, A. (1981). *Silent messages* (2nd ed.). Belmont, CA: Wadsworth.
- Mehrabian, A., & Williams, M. (1969). Nonverbal concomitants of perceived and intended persuasiveness. *Journal of Personality and Social Psychology*, 13, 37-58.
- Miller, N., Maruyama, G., Beaver, R., & Valone, K. (1976). Speed of speech and persuasion. *Journal of Personality and Social Psychology*, 34, 615-624.
- Patterson, M. L. (1983). *Nonverbal behavior: A functional perspective*. New York: Springer-Verlag.
- Patterson, M. L., Powell, J. L., & Lenihan, M. G. (1966). Touch, compliance, and interpersonal affect. *Journal of Nonverbal Behavior*, 10, 41-50.
- Paulsell, S., & Goldman, M. (1984). The effect of touching different body areas on prosocial behavior. *Journal of Social Psychology*, 122, 269-273.
- Pearce, W. B. (1971). The effect of vocal cues on credibility and attitude change. *Western Speech*, 35, 167-184.
- Pearce, W. B., & Brommel, B. J. (1972). Vocalic communication in persuasion. *Quarterly Journal of Speech*, 58, 298-306.
- Putman, W. B., & Street, R. L., Jr. (1984). The conception and perception of noncontent speech performance: Implications for speech accommodation theory. *International Journal of Sociology of Language*, 46, 97-114.
- Raymond, B. J., & Unger, R. K. (1972). The apparel oft proclaims the man: Cooperation with deviant and conventional youths. *Journal of Social Psychology*, 87, 75-82.
- Rosenthal, R. (1979). *Skill in nonverbal communication: Individual differences*. Cambridge, MA: Oelgeschlager, Gunn & Hain.
- Rosenthal, R., Hall, J. A., DiMatteo, M. R., Rogers, P. L., & Archer, D. (1979). *Sensitivity to nonverbal communication: The PONS test*. Baltimore: Johns Hopkins University Press.
- Ryan, E. B. (1979). Why do low-prestige language varieties persist? In H. Giles & R. N. St. Clair (Eds.), *Language and social psychology* (pp. 145-157). Baltimore: University Park Press.
- Shotland, R. L., & Johnson, M. P. (1978). Bystander behavior and kinesics: The interaction between the helper and victim. *Environmental Psychology and Nonverbal Behavior*, 2, 181-190.
- Smith, B. L., Brown, B. L., Strong, W. J., & Rencher, A. C. (1975). Effects of speech rate on personality perceptions. *Language and Speech*, 18, 145-152.
- Stang, D. J. (1973). Effects of interaction rate on ratings of leadership and liking. *Journal of Personality and Social Psychology*, 27, 405-408.
- Street, R. L., Jr. (1982). Evaluation of noncontent speech accommodation. *Language and Communication*, 2, 13-31.
- Street, R. L., Jr. (1984). Speech convergence and speech evaluation in fact-finding interviews. *Human Communication Research*, 11, 139-169.
- Street, R. L., Jr., & Brady, R. M. (1982). Speech rate acceptance ranges as a function of evaluative domain, listener speech rate and communication context. *Communication Monographs*, 49, 290-308.
- Street, R. L., Jr., & Giles, H. (1982). Speech accommodation theory: A social cognitive approach to language and speech behavior. In M. Roloff & C. Berger (Eds.), *Social cognition and communication* (pp. 193-226). Beverly Hills, CA: Sage.
- Tedeschi, J. T., & Bonoma, T. V. (1972). Power and influence: An introduction. In J. T. Tedeschi (Ed.), *The social influence processes* (pp. 1-49). Chicago: Aldine.
- Thakerar, J., & Giles, H. (1981). They are—so they spoke: Noncontent speech stereotypes. *Language and Communication*, 1, 255-261.

- Welkowitz, J., & Feldstein, S. (1969). Dyadic interaction and induced differences in perceived similarity. *Proceedings of the 77th Annual Convention of the American Psychological Association*, 4, 343-344.
- Willis, F. N., & Hamm, H. K. (1980). The use of interpersonal touch in securing compliance. *Journal of Nonverbal Behavior*, 6, 49-55.
- Winer, B. J. (1971). *Statistical principles in experimental design*. New York: McGraw-Hill.