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Social Perceptions as Mediators of the Effect of Speech Rate Similarity on Compliance

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Research on the relationship between speech rate and persuasion has provided inconsistent results. Recently, it was proposed that speech rate similarity affects compliance by increasing social attractiveness, which is more important to compliance than speaker credibility. Further, it was speculated that social attractiveness produces obligations to aid the speaker. This experiment tested these claims by predicting that if obligations mediated compliance, social attractiveness would only improve compliance when the speaker benefited from that compliance. In a 5 (Speaker Speech Rate) × 2 (Benefit to Speaker) design, 257 listeners, pretested on their speech rate, were exposed to 1 of 10 requests soliciting volunteers for a bogus research project. As expected, speech rate similarity enhanced social attractiveness, and faster speech rates increased speaker competence and dominance. Social attractiveness had a main effect on compliance, suggesting a direct effect on attraction. Higher sociability/character assessments and lower dominance increased compliance when the speaker benefited more, providing only limited support for the mediating role of obligations. Increased dominance and status also augmented compliance, especially when the speaker benefited less from compliance. Thus speech rate and other nonverbal behaviors may effect compliance by increasing the speaker's social attractiveness, creating obligations to comply, or exerting persuasive force through higher status and power.

In many situations, social influence depends, at least in part, on the communicator's image, expression of emotion, conversational management, and/or relational communication. These functions are often achieved through nonverbal cues that create images of authority and credibility, highlight relational obligations,

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or improve source attractiveness (Burgoon, Buller, & Woodall, 1989). The relative importance of these functions in an influence attempt is determined by the persuasive outcome sought. When attitude change is the goal, the persuader's image as a credible or knowledgeable source is important. By contrast, when making a request for help, the persuader's attractiveness and receiver's obligation to help the persuader are instrumental (Bettinghaus & Cody, 1987; Buller & Aune, 1988; Burgoon et al., 1989; Kelman, 1961; Roloff, 1987).

In a series of studies attempting to explain an anomalous interaction between speech rate and nonverbal decoding ability, Buller and his colleagues (Buller & Aune, 1988, 1992; Buller & Burgoon, 1986) found evidence for the mediating role of social attractiveness (measured as relational perceptions of intimacy, immediacy, and sociability/character). They demonstrated that similarity in speaker and listener speech rate was associated with greater social attractiveness and that higher attractiveness was positively associated with compliance with a request for help. In their most recent experiment, Buller and Aune (1992) suggested that obligations to help the speaker may underlie the positive impact of social attractiveness on compliance, following arguments proposed by Roloff (1987; Roloff, Janiszewski, McGrath, Burns, & Manrai, 1988).

There were several limitations to Buller and his colleagues' evidence that require researchers to use caution when accepting their theoretical explanation, not the least of which was a failure to test the mediating role of obligations. Thus the present investigation was designed to further investigate Buller and Aune's explanations for the relationship between changes in speech rate and compliance with request for help.

SPEECH RATE AND COMPLIANCE

Research on speech rate and persuasion has yielded inconsistent results. While most studies have found that faster rates bolster com-

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petence and extroversion perceptions (see Gunderson & Hopper, 1976; Mehrabian & Williams, 1969; Miller, Maruyama, Beaber, & Valone, 1976; Pearce, 1971; Pearce & Brommel, 1972; Smith, Brown, Strong, & Rencher, 1975; Street & Brady, 1982), faster rates have not always increased persuasion (for confirming evidence see MacLachlan, 1979; Mehrabian & Williams, 1969; Miller et al., 1976; for disconfirming evidence see Gunderson & Hopper, 1976; Pearce & Conklin, 1971; Wheelless, 1971; Woodall & Burgoon, 1983). Along the way, several explanations have been offered with little empirical support, including a credibility bolstering hypothesis (e.g., Miller et al., 1976), a counterargument disruption via distraction hypothesis (e.g., Osterhouse & Brock, 1970), and a resistance to persuasion hypothesis (e.g., Woodall & Burgoon, 1983).

Buller and Aune (1988) offered an explanation based on a synthesis of Giles's communication accommodation theory (CAT; Giles, Coupland, & Coupland, 1991; Giles, Mulac, Bradac, & Johnson, 1987; Street & Giles, 1982) and Bettinghaus and Cody's (1987) claims about the relative importance of social perceptions in influence attempts. According to CAT, communicators express values, attitudes, and intentions by altering their speech styles vis-à-vis one another. Favorable evaluations result when a change is optimally similar to a listener's own speech style (Giles et al., 1991; Giles et al., 1987; Street & Giles, 1982). Research by Street has shown that judgments of competence are linked to faster rates, supposedly due to social stereotypes of fast talkers (Street, 1984; Street & Brady, 1982), whereas judgments of social attractiveness are enhanced by perceptions of speech rate similarity between speaker and listener and diminished by perceptions of rate dissimilarity (Putnam & Street, 1984; Street & Brady, 1982). From this line of reasoning, Buller and Aune (1988) predicted that when a speaker encoded a speech rate similar to the listener's rate, the listener would assign more favorable social attractiveness evaluations in the form of intimacy and immediacy interpretations than when the speaker encoded a dissimilar speech rate. By contrast, increased speech rate would be associated with higher credibility and dominance ratings.

To explain the link between these social perceptions and compliance with a request for help, Buller and Aune (1988) drew on Bettinghaus and Cody's (1967) claim that when the outcome of an influence attempt is compliance, persuasion is based on the speaker's attractiveness, but when the goal is attitude change, persuasion is based on the speaker's credibility. Thus they predicted that higher

social attractiveness perceptions (i.e., intimacy and immediacy interpretations) would be associated with more compliance but credibility and dominance ratings would not.

In that experiment, Buller and Aune (1988) indirectly confirmed their theoretical explanation. They showed that good decoders (as tested on the Profile of Nonverbal Sensitivity [Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979]) who spoke faster judged a fast-paced request as more intimate and immediate and complied more with this similar fast request. By contrast, poor decoders who spoke slower considered a slow-paced request more intimate and immediate and complied more with this similar slow request.

In their next experiment, Buller and Aune (1992) elaborated on their explanation by incorporating Roloff's premise that relationship development creates obligations to aid relational partners. Roloff contends that intimacy is based on the exchange of actions and favors that fulfill partners' needs, so relational partners are obligated to accommodate requests and comply more with requests for help (Roloff, 1987; Roloff et al., 1988). By contrast, strangers must provide more elaboration in requests, like apologies, explanations, and inducements, than friends to secure help (Roloff et al., 1988). Buller and Aune (1992) suggested that another compliance-gaining strategy open to strangers was to carefully manage nonverbal cues, like speech rate similarity, to enhance their social attractiveness. In so doing, they might create in the listeners feelings of friendliness and a desire for a relationship with the speaker and produce primitive obligations to accommodate their requests. Buller and Aune (1992) were careful to state that while they did not expect obligations created by the nonverbal behavior of a stranger to equal those in well-established friendships, they might be sufficient to improve compliance with modest requests for help.

Buller and Aune's (1992) results provided additional confirmation that speech rate similarity enhances social attractiveness (i.e., immediacy, intimacy, and sociability/character). Further, immediacy interpretations were positively associated with compliance. However, this second experiment did not test the mediating role of obligations, but it was the only one to directly analyze the association between social attractiveness and compliance. The first study had only examined the correspondence between the patterns of mean ratings of social attractiveness (i.e., intimacy and immediacy), credibility evaluations, and compliance. Finally, Buller and Aune were not able to completely rule out credibility judgments as causes of compliance. Thus their findings

are suggestive, not confirmatory, of the mediating role of relational obligations in gaining compliance with requests for help.

HYPOTHESES

This experiment represents the first attempt to test the mediating role of obligations in the relationship between speech rate changes, social attractiveness evaluations, and compliance with requests for help. First, we hypothesized a positive relationship between speech rate similarity and the perceived social attractiveness of the speaker, social attractiveness being operationalized as perceptions of greater intimacy, immediacy, and sociability / character communicated by the speaker.

H1: As the similarity between the speaker's speech rate and the listener's speech rate increases, perceptions of the speaker's social attractiveness will increase.

We also anticipated that there would be a direct relationship between changes in speech rate and perceptions of credibility and dominance, such that faster rates would be associated with higher credibility and dominance evaluations. This prediction was made with the caveat that Buller and Aune's (1992) results revealed an upper limit to this direct relationship at about 400 syllables per minute.

H2: As speaker's speech rate increases, perceptions of competence and dominance will increase.

To test for the mediating role of obligations, we compared a situation in which obligations produced by greater social attractiveness are likely to affect compliance with a situation in which they are not. Roloff (1987) contends that in less intimate relationships (i.e., between strangers), obligations to help are not transferable beyond the requester. That is, they do not require that the receiver help someone other than the requester, like the requester's spouse, friend, or a group the requester belongs to. Only in more intimate relationships does providing aid to a third party related to the requester fulfill obligations to help the partner. His argument implies that obligations to help a stranger created by greater social attractiveness will affect compliance when compliance benefits the speaker. When the requester does not

appear to benefit from compliance, obligations linked to the social attractiveness of a stranger should be irrelevant to compliance decisions. Thus we manipulated the extent to which the speaker benefited from compliance with the request. If obligations mediate the relationship between social attractiveness and compliance, there should be an interaction between speaker benefit and social attractiveness on compliance. If social attractiveness has a direct impact on compliance, there will be merely a main effect for social attractiveness on compliance.

H3: There will be an interaction between speech rate similarity and benefit to the speaker, such that (a) when the speaker benefits more from compliance, higher perceptions of social attractiveness will enhance compliance, but (b) when the speaker benefits less from compliance, higher perceptions of social attractiveness will not enhance compliance.

Another possibility examined here is that competence and dominance evaluations affect compliance. Buller and Aune's theoretical rationale would argue against this; however, speaker competence and dominance may be relevant when the speaker does not benefit from compliance. In this situation, absolute speech rate's credibility bolstering effect may improve compliance.

We decided to manipulate experimental situations to test the mediating role of obligations rather than to measure obligations directly because of potential measurement problems. Listeners may not be sufficiently aware of obligations to accurately report on them. Obligations may be so proximal to the compliance decision that they cannot be separated from it, or people may not consciously consider obligations, even though they exist and increase persuasive force. In either event, a self-report measure might be open to self-perception effects (Bem, 1967), where listeners, being uncertain about their felt obligations, look to their compliance behavior to determine whether they felt obligated to comply. Hence a self-report measure would provide a test of compliance, not obligations. Just such a problem arguably exists in the measurement of counterarguments, a variable that is also very proximal to attitude change (Miller & Baron, 1973; Romer, 1979). This problem points out some of the ambiguities surrounding the obligation concept that will require careful measurement construction. Other problems include not knowing whether obligations to comply are unidimensional or multidimensional or how easily obligations to a person (in our case, a researcher) can be

separated from obligations to the organizations which they represent (i.e., the sponsoring academic department). Thus we felt it was more practical to first obtain evidence on obligations by manipulating experimental circumstances before investing extensive efforts in devising methods for measuring obligations.

METHOD

Participants

Undergraduate students from a large southwestern university were recruited to take part in this two-phase experiment. Only those who completed both phases ($N = 257$) were included in the analyses. The students who volunteered to participate received extra credit in their courses.

Speech Rate Pretest

To measure participants' (hereafter referred to as "listeners") speech rates, 1-minute audio recordings of each listener's voice were made, using a studio-quality (Wallensack) cassette recorder and microphone. These recordings were made during individual sessions over a 2-week period. To obtain a sample of natural speech, each listener was recorded while trying to "persuade a friend to lend them \$30 to go to a concert with a date." The middle 30-second portion of each message (15 to 45 seconds) was transcribed to ensure that rate was assessed accurately, without being affected by difficulty in start-up or early completion of the message. Speech rate was computed by having an undergraduate assistant count the number of syllables in this 30-second interval and doubling that count to obtain a syllables-per-minute estimate. To check interrater reliability, a second undergraduate assistant counted the syllables in 44 randomly selected transcripts; Ebel's intraclass correlation indicated very high interrater reliability ($r = .99$). In the subsequent analyses, a measure of actual speech rate similarity was computed by taking the absolute value of the difference between the speaker's speech rate and the listener's speech rate, each expressed in syllables per minute. A *lower* score on this measure indicated more speech rate similarity.

Compliance Messages

Ten versions of a message requesting participants to volunteer for a bogus mass communication experiment were created. The messages asked participants to volunteer to view up to five half-hour television programs during the term.

Benefit-to-Speaker Manipulation

Two verbal appeals were designed. One version indicated that the speaker would benefit more from the listener's compliance (i.e., participating in the bogus experiment), and the other indicated that the speaker would benefit less from the compliance. Benefit to the speaker was manipulated by altering who was conducting the bogus experiment and requesting help (speaker vs. department) and who benefited from the successful completion of the experiment (speaker vs. society). The messages were matched on length and number of arguments (see appendix).

A manipulation check was performed on the benefit-to-speaker manipulation by asking 49 undergraduate students who did not participate in the experiment to read one of the messages (25 read the high-benefit message and 24 read the low-benefit message). They rated it on how much the speaker would benefit from participating in the experiment, how much society, in general, would benefit from the speaker's participation, and who would benefit more from this participation—the speaker or society (all 7-point bipolar scales). Those who read the high benefit-to-speaker message said that participation would benefit the speaker more ($M = 6.00$), $F(1, 47) = 9.41$, $p < .05$, $\eta^2 = .17$, and society less ($M = 3.60$), $F(1, 47) = 10.22$, $p < .05$, $\eta^2 = .18$, than those who read the low benefit-to-speaker message ($M_s = 4.63$ and 4.75 , respectively). On the direct comparison question, those receiving the high benefit-to-speaker message felt that the speaker would benefit more than society ($M = 5.92$) than did those receiving the low benefit-to-speaker message ($M = 3.96$), $F(1, 47) = 22.89$, $p < .05$, $\eta^2 = .32$.

Speech Rate Manipulation

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. Using a studio-

quality cassette recorder and microphone, the confederate was recorded saying each message at five different speech rates. The very slow versions were recorded at 155 syllables per minute, the slow versions as 215 syllables per minute, the moderate versions at 275 syllables per minute, the fast versions at 335 syllables per minute, and the very fast versions at 395 syllables per minute. These rates were based in part on work done by Street and Brady (1982) and were similar to those used in preceding studies by Buller and Aune (1988, 1992). These rates were expected to represent rates that were slower than, within, and faster than the latitudes of acceptable speech rates of slower- and faster-speaking listeners.

Procedure

Listeners were recruited for an experiment investigating "communication and persuasion." They were informed that the experiment would require one session outside of class. Initially, listeners signed up for individual sessions to measure their speech rates. Recruitment was performed via a tape-recorded message that described the purpose of the experiment and the tasks required of the participants. A male confederate, who did not create the experimental messages, encoded the recruiting message. This message was tape-recorded at 244 syllables per minute. The use of the tape-recorded recruiting message set a precedent for the experimental messages that requested listeners to volunteer for a bogus media experiment.

After obtaining measures of listeners' speech rates in individual sessions, an experimental assistant visited each class from which listeners had been recruited for the individual sessions. The assistant played 1 of the 10 experimental recruitment messages on a Sony stereo cassette player to each class. Messages were assigned to classes to produce relatively equal cell sizes in the 5 (Speech Rate) \times 2 (Benefit to Speaker) design. The assistant did not reveal that the experimental recruitment message was related to the experiment in which the listeners' speech rates were measured.

Before hearing the messages, listeners were told that the tape-recorded recruitment message was a new departmental method of recruiting research participants. After hearing the message, listeners were asked to indicate whether they volunteered for the experiment and how many half-hour shows they volunteered to watch (measure of immediate compliance). Then, listeners were asked to complete

credibility, relational communication, and perceived speech rate similarity measures, ostensibly to provide the department with information on whether to continue using the new tape-recorded recruitment method. Finally, to measure delayed compliance, listeners who volunteered for the bogus experiment were invited to appear at one of five experimental sessions the following week.

Posttest Questionnaire

Immediate Compliance

Attached to the front of the dependent measures was a sheet on which listeners were to indicate whether they volunteered to participate in the bogus experiment, and if so, how many half-hour television programs they volunteered to watch, with a limit of five programs. This immediate compliance measure was identical to the compliance measure used by Buller and Aune (1988, 1992).

Speaker Credibility

A 15-item semantic differential scale designed by McCroskey (McCroskey, Hamilton, & Weiner, 1974; McCroskey, Jensen, & Valencia, 1973) was used to measure the speaker's credibility following the experimental message. Four credibility dimensions were created, following Buller and Burgoon (1986): sociability/character (Cronbach's $\alpha = .82$), competence ($\alpha = .79$), composure ($\alpha = .74$), and extroversion ($\alpha = .79$). As in Buller and Aune's (1992) experiment, the sociability/character rating was considered a measure of social attractiveness. The composure and extroversion measures were not relevant to theoretical rationale; they were simply used as foils and hence were not analyzed.

Relational Perceptions

A reduced version of Burgoon and Hale's (1987) Relational Communication Scale assessed the respondents' perception of the speakers' implicit verbal and nonverbal messages about the nature of their interpersonal relationship. The scale measures four general relational themes: emotional arousal/composure/formality ($\alpha = .59$), intimacy ($\alpha = .81$), immediacy ($\alpha = .82$), and dominance ($\alpha = .76$). The intimacy

and immediacy ratings were treated as two additional measures of social attractiveness. The dominance measure was combined with the competence evaluation to test Hypothesis 2. The emotional arousal rating was theoretically irrelevant and not analyzed.

Perceived Speech Rate Similarity

Listeners' perceptions of how similar the speaker's speech rate was to their own was measured by the single bipolar question used in Buller and Aune's (1992) experiment: "Compared to the way I talk, the speaker spoke slower than me/spoke faster than me." The scale midpoint, 0, was transformed to reflect the greatest similarity, whereas -4 (spoke slower) and +4 (spoke faster) were treated as indicating the greatest dissimilarity. Thus the scale ranged from 4 (*very similar*) to 0 (*very dissimilar*). Three additional items from Buller and Aune's (1992) experiment were asked as foils, including two items assessing preferences for the speaker's voice and an item measuring perceived similarity in pausing rate.

Delayed Compliance Measure

After completing the posttest, listeners who volunteered for the experiment were invited to report to the research lab during one of five periods during the next week. There was one period during each day of the following week and each period was 4 hours in length. When participants arrived at the laboratory, they were greeted by an experimental assistant who told them that the equipment necessary for the study had not arrived. Listeners were asked to leave their name and social security number in order to get credit for coming to the experiment. Appearing at the research lab was considered delayed compliance.

RESULTS

Hypothesis 1

Hypothesis 1 predicted that speech rate similarity increased the speaker's social attractiveness. It was tested by correlating speech rate similarity with perceptions of intimacy, immediacy, and sociability/character. Both perceived and actual speech rate were included in this

analysis because Buller and Aune (1988, 1992) suggested that perceived speech rate, rather than actual speech rate, may be a better predictor of listeners' perceptions.

Hypothesis 1 was supported. Actual rate similarity was significantly correlated with intimacy ($r = -.30, p < .05$) and sociability/character ($r = -.18, p < .05$), and as predicted, greater actual similarity was associated with perceptions of more intimacy and sociability/character. However, actual rate similarity was not associated with perceptions of speaker's immediacy ($r = -.08, p > .05$). (Note: Lower score on the actual rate similarity measure indicated greater similarity.) Perceived speech rate similarity was positively correlated with all three relational perceptions. As perceived rate similarity increased, perceptions of speaker's intimacy ($r = .27, p < .05$), immediacy ($r = .30, p < .05$), and sociability/character ($r = .31, p < .05$) increased.

Hypothesis 2

Hypothesis 2, predicting that competence and dominance ratings would be positively associated with speech rate, was supported, although an upper limit to this relationship was again evident. A one-way analysis of variance on competence evaluations showed that listeners' competence evaluations increased with faster rates up to a point, $F(4, 252) = 10.24, p < .05, \eta^2 = .14$ (very slow $M = 3.74$, slow $M = 4.12$, moderate $M = 5.02$, fast $M = 4.60$, and very fast $M = 4.04$). Once speech rate exceeded 275-355 syllables per minute, competence evaluations declined. A one-way analysis of variance on perceived speaker dominance showed that perceived dominance was also enhanced by faster speech rates, $F(4, 259) = 13.47, p < .05$ (very slow $M = 3.36$, slow $M = 4.21$, moderate $M = 4.58$, fast $M = 4.57$, and very fast $M = 4.28$), but once again this was true only for rates up to 335 syllables per minute.

Speech rate similarity showed some association with competence and dominance evaluations. Actual rate similarity was not related to either dominance ($r = -.04, p > .05$) or competence ($r = -.10, p > .05$), but perceived speech similarity was correlated with higher ratings on dominance ($r = .24, p < .05$) and competence ($r = .20, p < .05$).

Hypothesis 3: Immediate Compliance

Hypothesis 3 predicted that enhanced social attractiveness and speaker benefit would interact such that greater social attractiveness

created by speech rate similarity would increase compliance when the speaker benefited more from the compliance but would not affect compliance when the speaker benefited less from the compliance. This hypothesis was first tested on immediate compliance—the number of half-hour television shows that the listener agreed to watch—using multiple regression procedures for categorical (i.e., more benefit vs. less benefit) and continuous (i.e., social attractiveness operationalized as intimacy, immediacy, and sociability/character ratings) independent variables described by Pedhazur (1982).

Sociability/Character

The predicted interaction between benefit to speaker and sociability/character on immediate compliance was significant, R^2 change = .01, F change(1, 255) = 3.18, $p < .05$. When the speaker benefited more from the compliance, increased sociability/character perceptions were associated with greater compliance (regression equation: $Y = .06 + .32X$ [with X being sociability/character perceptions]), but when the speaker benefited less from the compliance, perceptions of sociability/character were not associated with immediate compliance (regression equation: $Y = .80 + .08X$). This interaction was disordinal, rendering the main effects uninterpretable.

Intimacy and Immediacy

By contrast, the predicted interaction between benefit-to-speaker and favorable social attractiveness did not emerge in the analyses of intimacy and immediacy perceptions (intimacy: R^2 change = .00, F change[1, 255] = 1.23, $p > .05$; immediacy: R^2 change = .01, F change[1, 255] = 2.35, $p > .05$). Instead, the main effects for perceived intimacy and immediacy were significant. As perceptions of intimacy ($b = .14$, R^2 change = .02, F change[1, 256] = 5.27, $p < .05$) and immediacy ($b = .18$, R^2 change = .03, F change[1, 256] = 9.27, $p < .05$) increased, immediate compliance increased. The main effect for benefit-to-speaker was nonsignificant in both analyses, R^2 change = .00, F change(1, 256) = .40, $p > .05$.

The results suggest two conclusions. The emergence of the predicted interaction between sociability/character and speaker benefit supports the supposition that relational obligations created by social attractiveness increase immediate compliance with requests for help.

However, greater social attractiveness (i.e., intimacy and immediacy) also has a direct effect on immediate compliance with requests for help, suggesting a less complex attraction effect.

Dominance and Competence Perceptions

Similar regression analyses were performed on perceived speaker competence and dominance to see whether either of these perceptions affected compliance, particularly when the speaker's benefit was low. Neither competence (R^2 change = .01, F change[1, 255] = 2.18, $p > .05$) nor dominance (R^2 = .00, F change[1, 255] = .54, $p > .05$) interacted with benefit-to-speaker to affect immediate compliance. Dominance did have a significant main effect on immediate compliance (R^2 change = .02, F change[1, 256] = 5.41, $p > .05$), with greater dominance associated with higher immediate compliance, but the main effect for competence on immediate compliance was nonsignificant (R^2 change = .01, F change[1, 256] = 1.75, $p > .05$).

The lack of an interaction with benefit-to-speaker showed that dominance and competence did not affect immediate compliance when benefit to the speaker was low. That perceived dominance improved immediate compliance may indicate that power, status, or intimidation plays a role in securing compliance, as well as social attractiveness.

Hypothesis 3: Delayed Compliance

As a further test of Hypothesis 3, analyses were performed on delayed compliance. Multiple discriminant analysis was used instead of multiple regression because the measure of delayed compliance was dichotomous (complied vs. did not comply). As a result, changes in Wilks's lambda rather than squared multiple R were tested. Further, the analysis of delayed compliance was performed only on listeners who immediately complied with the request to volunteer for the bogus study ($n = 164$) because they were the only listeners invited to come to the bogus study the following week.

Sociability/Character

Contrary to immediate compliance, perceived speaker sociability/character did not interact with benefit-to-speaker to affect delayed

compliance, Wilks's lambda change = .00, F change(1, 159) = .21, $p > .05$. In addition, sociability/character had no main effect on delayed compliance, Wilks's lambda change = .02, F change(1, 160) = 2.95, $p > .05$.

Intimacy

There was significant interaction between perceived speaker intimacy and benefit-to-speaker, Wilks's lambda change = .04, F change (1, 160) = 7.08, $p < .05$. Contrary to Hypothesis 2, perceived intimacy did not discriminate compliers (intimacy $M = 3.67$) from noncompliers (intimacy $M = 3.81$) when the speaker benefited more from the compliance; however, those who complied with the request that benefited the speaker less (intimacy $M = 3.67$) perceived more speaker intimacy than those who did not comply with this request (intimacy $M = 2.85$). The main effect of perceived intimacy was uninterpretable because the preceding interaction was disordinal.

Immediacy

The predicted interaction between perceived speaker immediacy and benefit-to-speaker was not significant, Wilks's lambda change = .01, F change(1, 159) = 1.68, $p > .05$. Instead, perceived immediacy had a main effect on delayed compliance, Wilks's lambda change = .03, F change(1, 160) = 5.09, $p < .05$. Those who complied by appearing at the bogus research session reported higher perceptions of speaker's immediacy ($M = 3.87$) than did those who did not appear ($M = 3.49$).

Dominance and Competence

The analysis of perceived dominance revealed a significant interaction between perceived dominance and benefit-to-speaker, Wilks's lambda change = .05, F change(1, 159) = 8.03, $p < .05$. When the speaker benefited less from compliance, those who appeared at the bogus research session perceived more dominance by the speaker (dominance $M = 4.35$) than did those who did not appear at the bogus research session (dominance $M = 3.75$). By contrast, when the speaker benefited more from compliance, compliers perceived less dominance ($M = 4.14$) than did noncompliers ($M = 4.52$).

Perceived speaker competence was unrelated to delayed compliance. Neither the interaction between perceived competence and benefit-to-speaker (Wilks's lambda change = .00, F change[1, 159] =

.49, $p > .05$) nor the main effect of perceived competence (Wilks's lambda change = .02, F change[1, 160] = 2.88, $p > .05$) significantly affected delayed compliance.

The process that produced delayed compliance was both similar and dissimilar to that producing immediate compliance. Enhanced social attractiveness (in this case, greater immediacy) improved delayed compliance, regardless of the benefit to the speaker. This suggests a general attraction effect not mediated by relational obligations. Surprisingly, greater social attractiveness in the form of greater intimacy was somewhat more influential when the speaker benefited less from compliance than when the speaker benefited more. Perceived dominance also improved compliance when the speaker benefited less.

DISCUSSION

This experiment examined explanations for the relationship between speech rate and compliance with requests for help. It began by testing the relationship between speech rate changes and social perceptions and replicated CAT predictions that speech rate similarity increases a speaker's social attractiveness whereas faster rates increase a speaker's competence and dominance (Giles et al., 1987). It then went further to provide an initial test of Buller and Aune's (1992) explanation that social attractiveness enhances compliance because it produces obligations to help the speaker by signaling friendliness and interpersonal closeness (Rolloff, 1987; Rolloff et al., 1988). The experiment provided some support for the mediating role of obligations. However, the data also showed that social attractiveness has a direct effect on compliance and that perceptions of speaker dominance can contribute to compliance as well.

The data presented in this experiment, coupled with earlier evidence provided by Buller and Aune (1988, 1992), Street (1984; Street & Brady, 1982), and Woodall and Burgoon (1983), conclusively confirm CAT's explanation for the relationship between faster speech rates, speech rate similarity, and social perceptions of competence and social attractiveness. Clearly, speaking faster improves the speaker's perceived competence, as well as perceived dominance, up to about 350 or 400 syllables per minute. After that point, competence and dominance evaluations suffer. By contrast, social attractiveness is determined by speech rate similarity rather than absolute changes in

speech rate. Greater similarity makes a speaker more socially attractive. Notably, perceived speech rate similarity did not show a substantial superiority over actual speech rate similarity in producing perceptions of social attractiveness, contrary to Buller and Aune's (1992) results. This is probably due to measuring actual similarity by subtracting the listeners' speech rate from the speaker's speech rate rather than using ANOVA procedures to compare listeners' and speaker's speech rates as Buller and Aune did. Our subtraction method was likely a more sensitive and accurate measure of actual similarity.

The primary purpose of the experiment was to examine the relationship between these social perceptions and compliance with requests for help. Buller and Aune (1988, 1992) made two claims concerning this relationship that had not been tested simultaneously in the same experiment. First, they argued that social attractiveness evaluations would be more influential than competence or dominance perceptions in decisions to comply with requests for help (Buller & Aune, 1988). They based their claim on Bettinghaus and Cody's (1987) arguments that speaker attractiveness is more instrumental in gaining compliance with requests for help, whereas speaker credibility is more helpful in achieving attitude change. Our data supported this first speculation. The direct effect of perceptions of intimacy and immediacy and immediate compliance implies that social attractiveness increases compliance. Moreover, speaker competence and dominance had almost no effect on compliance with the request for help. The direct effect of social attractiveness conforms with the positive effect of physical attractiveness on persuasion (Chaiken, 1979; Horai, Naccari, & Fatoullah, 1974; Mills & Aronson, 1965; Norman, 1976). Attraction is probably successful because it stimulates an identification process, wherein targets comply because of the interpersonal rewards for agreeing with an attractive other (Kelman, 1961).

More recently, Buller and Aune (1992) proposed that the attraction-compliance relationship is mediated by obligations to help a relational partner. Drawing on Roloff's (1987) argument that relationship development produces obligations to help the partner, Buller and Aune surmised that one way for strangers to improve compliance was to increase their social attractiveness, which made them appear friendlier and expressed interpersonal closeness. Such an impression should create obligations to help, albeit not as strong as those among friends, and enhance compliance.

If relational obligations mediate the relationship between social attractiveness and compliance, they should be more influential when the speaker benefits more from the compliance than when the speaker does not because obligations to help a stranger, however they arise, are typically not transferable beyond that individual (Roloff, 1987). We obtained only limited support for this prediction. The predicted interaction between social attractiveness and benefit to the speaker was most evident in the analysis of sociability/character perceptions. More favorable perceptions of sociability/character were related to higher immediate compliance only when the speaker benefited more from the compliance. When the speaker benefited less, immediate compliance was unrelated to sociability/character perceptions. Further indirect evidence for the predicted interaction with benefit-to-speaker may come from the finding that the lack of dominance increased delayed compliance when the speaker benefited more from the compliance. Perhaps lower dominance communicated a more equitable relationship with the listener, enhancing perceptions of closeness and obligations to comply.

These findings are less convincing than expected and cast doubt on the mediating role of relational obligations. It is possible that they mediate mainly between perceptions of friendliness (i.e., sociability/character), not perceptions of closeness (i.e., intimacy and immediacy) because these two types of perceptions reflect different judgments. It is possible that a listener's perceptions of immediacy and intimacy are judgments of how much the requester communicated relational closeness, but perceptions of sociability/character may represent how much the listener accepted that closeness or also wanted to create a relationship with the requester. One way for the listener to express acceptance of, or desire for, relational closeness might be to comply with a request that benefits the requester. Compliance, then, becomes a relational message indicating attraction to the requester. Compliance also may be seen as a way of continuing the relationship because, by helping the requester, the listener obligates the *requester* to future exchange that can be satisfied by either returning the favor or perhaps continuing the interaction at a future date. Unfortunately, the current experimental design could not assess whether compliance occurred in response to relational obligations or as a strategic move that communicates the listener's desire to establish a relationship with the speaker.

Another possibility is that the character assessments associated with sociability ratings were more influential when benefit to the

speaker was high than when it was low. It may be that the combination of speech rate similarity and high benefit-to-speaker increased the perceived honesty and integrity of the speaker and created the perception that the experiment would have more immediate payoffs to the listeners. Consequently, compliance would be most personally rewarding in this situation. In this scenario, reward to the listener, not obligations to help the speaker, stimulate compliance.

A third possibility is that relational obligations are important to compliance decisions by some listeners but that other listeners are influenced simply by an identification process and respond to attractiveness across many situations. That is, both processes occur, and it is then a matter of identifying what types of listeners respond to obligations accompanying social attractiveness and what types respond merely to attractiveness per se.

A final notable outcome was that perceived dominance improved compliance when the speaker benefited less. As perceived dominance increases, listeners may feel more pressure to comply; that is, they might be intimidated. Alternately, the speaker's status or dominance might legitimize the request and exert force on the listeners to comply, especially when the request is framed in terms of the responsibilities of members of an organization or of society, as it was in this experiment.

In the end, this study appeared to identify three ways in which speech rate changes can affect compliance with requests for help. The most far-reaching means may be to invoke the identification process by enhancing social attractiveness with rate similarity. In this experiment, the direct effect of social attractiveness was witnessed in both immediate and delayed compliance and at both levels of speaker benefit. For some targets, though, the social attractiveness created by rate similarity might produce obligations to aid the speaker. When compliance directly benefits the speaker, these obligations precipitate compliance. Finally, perceptions of dominance or status associated with faster speech might improve compliance, especially when the speaker does not benefit from the request or the request is based on social or organizational rights and responsibilities. The task set before researchers is to better understand the type of listeners and persuasive circumstances that determine when each of these processes occurs.

Caveats and Limitations

The effect sizes in this experiment were moderate to low, with the relationship between social attractiveness and compliance being small

(accounting for 2%-5% of the variance in compliance). Rosenthal and Rosnow (1985) argue that even apparently small effects can represent sizable differences in the binomial success of an intervention. An r^2 of .02 corresponds to a binomial difference in success of .14 (i.e., 57% comply vs. 43% not comply), and an r^2 of .05 produces a binomial difference in success rate of .22 (i.e., 61% comply vs. 39% not comply). Seen in this way, speech rate changes and accompanying social perceptions obtained meaningful changes in compliance.

Furthermore, the small effect sizes may underestimate the potential of nonverbal cues to alter compliance. The focus on a single nonverbal cue, changes in speech rate, may have reduced the speaker's ability to influence social attractiveness. A restricted range of social attractiveness evaluations can reduce the observed effect size of their relationships with compliance (Hunter, Schmidt, & Jackson, 1982). Future studies should manipulate nonverbal cues or sets of cues that have a greater impact on listeners' social perceptions of a speaker to determine just how influential these perceptions are in listeners' compliance decisions. Immediacy cues (e.g., eye contact, touch, forward lean, proximity) may be especially well-suited for affecting perceptions of social attractiveness and compliance (for examples, see Baron, 1978; Ellsworth & Langer, 1976; Kleinke, 1977; Patterson, Powell, & Lenihan, 1986; Smith & Knowles, 1979; Willis & Hamm, 1980).

A limitation to the study was that it did not present a "change" in speech rate. Rather, it simply presented speech rates that were similar or dissimilar to the listeners' rates. The theoretical rationale, and more generally CAT, explain reactions to *changes* in speech style. It is possible that by not exhibiting a change in speech rate, listeners may not have considered the similarity in speech rates "responsive" to their own speech style. Such a problem would most likely reduce the effect of similarity on social attractiveness perceptions. However, several studies (Buller & Aune, 1988, 1992; Buller & Burgoon, 1986; Woodall & Burgoon, 1983), including this one, have shown that similarity produced without apparent "changes" in speech rate (or speech style) consistently increases social attractiveness evaluations. It is likely that speech rate similarity has some consensual meaning in the culture regardless of whether it occurs through a change in rate.

Another limitation is that the analysis plan did not directly assess the impact of speech rate similarity on compliance. Instead, it individually analyzed the two steps in the theoretical rationale—changes in speech rate altered listeners' interpretations that in turn affected compliance decisions. Separate analyses increased the chances of

detecting the small effects witnessed in this study because the presence of mediating variables in the causal connection between speech rate similarity and compliance reduced the size of the observed relationship between these two variables (Kenny, 1979). The analysis plan, though, had the disadvantage of not estimating how much of the change in compliance was attributable solely to changes in speech rate.²

Finally, as noted at the outset of the experiment, obligations to comply were not measured in this experiment. Because the present results provide only limited support for their mediating role between social attractiveness and compliance, devising a measure of obligations is a necessary next step in research on Roloff's arguments about the nature of compliance in interpersonal relationships. The potential definitional and perceptual problems that we discussed earlier provide challenges to measurement design and highlight that simply asking someone if they felt obligated to help the requester may not yield valid responses.

Epilogue

There are several routes to successful social influence. Nonverbal communication plays an important role by determining the attractiveness of the requester and creating images of power and credibility (Burgoon et al., 1989). Whether nonverbal communication aids or hinders social influence is dictated by the persuasive outcomes sought, the social perceptions of receivers, and the behavior of the actors vis-à-vis one another. Our experiment shows that there is no one best nonverbal strategy. Unfortunately, researchers have only begun to understand how goals, circumstances, and actors intersect to determine which nonverbal behavior will improve persuasion. As our theoretical approach illustrates, the complexity of these issues require the synthesis of theories addressing aspects of interpersonal interaction, person perception, nonverbal behavior, and persuasion.

APPENDIX

High Benefit-to-Speaker Message

I am conducting the third in a series of studies examining the cognitive impact of mediated messages and information-seeking and information-using behaviors of local media consumers. I am seeking students to help me by serving as subjects for this ongoing project. I believe this project is worthy of your help.

First, the series of studies will require the participation of hundreds of volunteers. To date, I have only been able to recruit about half the number of people that I need. Without the remaining number of participants, my study cannot be completed. I would greatly appreciate the help of any student volunteers that could take the time to participate in my studies.

Second, I have committed large amounts of my own time and funds to these studies. Because I have dedicated so much of my efforts to these studies, at the expense of other projects, I have quite a lot at stake. If completed, this research will contribute greatly to my career plans and goals. I will be able to extend these studies into a productive line of research. On the other hand, if I am unable to complete these studies, my credibility may be damaged and my opportunities for promotion almost certainly will be affected.

Third, it is quite possible that I may lose the grant that has funded my research so far. My grant originally funded this series of projects for a 12-month period, with the possibility of an extension of funding if my results were evaluated as worthy of continuing support. If I am to maintain this grant and continue my work, I need to complete the current phase of this study immediately. I need a large number of volunteers as quickly as possible.

Finally, my ability to obtain future grants is riding on the completion of this series of studies. If I should fail to accomplish all of my proposed projects, it will be extremely difficult to justify awarding me with additional funding for upcoming studies.

As you can see, this study is important to me and worthy of your time and support. Should you agree to help me with this study, you will view at least one, and if your schedule permits, up to five televised messages. After viewing each message, you will complete several instruments that will give us an indication of the specific impact of each message on your beliefs, attitudes, and values.

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

Low Benefit-to-Speaker Message

This department is conducting the third in a series of studies examining the cognitive impact of mediated messages and information-seeking and information using behaviors of local media consumers. We are presently

recruiting students to serve as subjects for this ongoing study. The project is worthy of your support.

First, it is mandatory that citizens be fully aware of local news and information. Results from this study have made local news media aware of populations that have been underrepresented in demographic studies of the area. Because of this fact, these local populations have been deprived of a full awareness of pertinent and valuable news and information.

Second, it is equally important that the population be provided with up-to-date health and medical information. This study has made local health agencies more aware of information needs that have not been met for a significant portion of the local population. For instance, the most recent study showed that two local populations were not informed of newly available health-related services until a full year after the majority of the population had become aware of these services.

Third, it is the responsibility of the media to provide citizens with a full awareness of social services and public assistance programs. Future concerns of this project will involve an investigation of public awareness regarding these services and programs. Basic research needs to be conducted that would inform the appropriate agencies as to which media are best reaching the target populations and which media are being underutilized.

Finally, the federal government has recognized the value of this study by providing this project with a generous 5-year grant. In granting these funds, the federal government acknowledged the need for such study and recognized the importance of developing this data base.

As you can see, this is an important study and worthy of your time and support. Should you agree to help us with this study, you will view at least one, and if your schedule permits, up to five televised messages. After viewing each message, you will complete several instruments that will give us an indication of the specific impact of each message on your beliefs, attitudes, and values.

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

NOTES

1. Despite concerns about the validity of measuring obligations to comply, 58 undergraduate students read one of the messages and rated how obligated they felt to help the Department of Communication by volunteering to participate in the experiment and how obligated they felt to help the speaker by volunteering to participate (1 = not obligated and 7 = obligated in both items). They also indicated how likely they would be to volunteer to participate on three 7-point bipolar scales (*very likely, very certain, and very probable*) (Cronbach's $\alpha = .93$).

Those who read the high benefit-to-speaker message ($M = 4.38$) did not feel significantly more obligated to comply than did those who read the low benefit-to-speaker message ($M = 3.97$), $F(1, 56) = .93, p > .05, \eta^2 = .02$. Entering participants' obligations to help the Department of Communication as a covariate, $F(1, 55) = 9.50, p < .05$, also did not yield a significant difference between messages in obligations to comply, $F(1, 55) = 1.45, p < .05$. However, those who read the high benefit-to-speaker message ($M = 14.83$) were more likely to comply with the request than were those who read the low benefit-to-speaker message ($M = 12.83$), $F(1, 56) = 2.77, p < .05$ (one-tailed), $\eta^2 = .05$. Also, obligation to comply was strongly correlated with compliance ($r = .53, p < .05$).

The correlation between obligations and compliance were consistent with Buller and Aune's explanation. The obligations and compliance findings are more difficult to interpret in light of the explanation. It could be that people were less consciously aware of their obligations to help. Consequently, they did not report significantly higher obligations, even though these obligations caused them to comply more with the high benefit-to-speaker message than with the low benefit-to-speaker message.

What does this mean for the experimental manipulation? Very little. It was not necessary that the high benefit-to-speaker message create more obligations than the low benefit-to-speaker message to test the mediating role of obligations. Rather, it was more important that the former message created perceptions that the speaker benefited more than did the latter message. This enabled obligations *created by the speaker through speech rate similarity and accompanying social attractiveness perceptions* (not those created by the type of benefit appeal) to affect compliance with the high benefit-to-speaker message. When receiving the low benefit-to-speaker message, compliance decisions should not have been influenced by such obligations because these obligations were irrelevant to compliance decisions in that situation, not because this message created fewer obligations itself.

2. For the interested reader, the multiple regression analyses on immediate compliance revealed a significant interaction between actual speech rate similarity and benefit-to-speaker, R^2 change = .01, F change(1, 257) = 3.32, $p < .05$. Actual similarity improved immediate compliance when the speaker benefited more from the compliance (regression equation: $Y = 1.44 - .002X$ [where X is actual rate similarity, with low scores corresponding to more similarity]), whereas actual similarity decreased immediate compliance when the speaker benefited less from the compliance ($Y = .90 + .002X$). Perceived rate similarity did not interact with benefit-to-speaker, $R^2 = .006$, F change(1, 253) = 1.70, $p > .05$. Neither actual rate similarity (Wilks's lambda change = .00, F change[1, 259] = .16, $p > .05$) nor perceived rate similarity (Wilks's lambda change = .00, F [1, 255] = .00, $p > .05$) interacted with benefit-to-speaker to affect delayed compliance.

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