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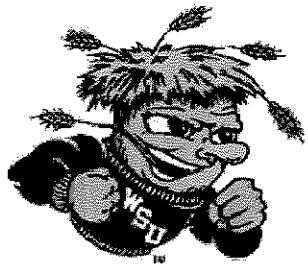

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The Effects of Vocalics and Nonverbal Sensitivity on Compliance
A Replication and Extension

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An interaction between receiver ability to decode vocalic cues and speaker vocalic patterns in obtaining compliance was investigated in this study. Expectancy theory was offered as an explanation for this interaction. Because changes in vocalic patterns can violate expectations, receivers make consistent interpretations of these vocalic cues, and evaluations of these interpretations may be affected by decoder predispositions toward communication that, in turn, produce differential perceptions of source reward. Respondents were interviewed by trained encoders who used neutral, pleasant, and hostile vocal patterns. Compliance was assessed by asking for a donation of time to communication research. Follow-up surveys measured perceived relational messages, interviewer credibility, vocal pleasantness, and the degree to which the vocalic pattern was expected. The predicted disordinal interaction between decoding ability and voice condition was found. Decoding ability did not correlate with predispositions, nullifying source reward as a factor in the evaluation of vocalic violations. It was suggested that preferences for vocalic patterns influenced evaluations: Good decoders may have preferred affiliative cues and thus complied more with pleasant voices, whereas poor decoders may have preferred assertive patterns and complied more with hostile voices.

A recent experiment by Hall (1980) examined the impact of vocal encoding and decoding ability on persuasion. Her results are intriguing because they unexpectedly showed that only decoding ability was related to compliance. These findings suggest that a fundamental shift in research focus from source behavior to receiver cognitive processing may be needed to understand completely this function of nonverbal communication. The present study was designed to (1) replicate Hall's study with an improved experimental design, and (2) test an expectancy theory explanation for the interaction she observed.

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Hall's Findings

Hall hypothesized that social influence through nonverbal behavior is a function of both the encoder's and the decoder's skill in nonverbal communication. She had telephone interviewers attempt to gain greater (high persuasion) or lesser (low persuasion) compliance by modifying their vocal tone when making a request of respondents who had been pretested on their ability to decode positivity and dominance from the voice. The high-persuasion voice consisted of more warm, friendly, pleasant vocal patterns; the low-persuasion voice was stiffer, colder, and more businesslike. Good decoders complied more in response to the high-persuasion voice and less to the low-persuasion voice, and poor decoders donated less time to the high-persuasion condition and more to the low-persuasion condition.[1] Hall argued that the responses of the good decoders were expected and caused by their accurate decoding of the vocal cues. She surmised that poor decoders, by contrast, became defensive and reactant in the high-persuasion condition because the voice carried affective overtones, but were less defensive in the low-persuasion condition because it contained quantitatively fewer nonverbal cues.

Four problems need to be addressed before accepting Hall's findings and explanation. First, her results may simply be due to sampling error. Her sample of 42 decoders may have been atypical. This calls for replication with a new sample to see if the pattern holds. Second, using only high- and low-persuasion conditions, which appear to represent different degrees of vocal warmth and spontaneity, leaves open the question of whether a vocal pleasantness continuum has a linear or nonlinear relationship with compliance. Thus it seems advisable that a replication include a minimum of three levels: a pleasant voice, a neutral voice (equivalent to Hall's low-persuasion condition), and a truly hostile voice. Third, because Hall did not anticipate the interaction, personality and communication measures were not included that could clarify the underlying cognitive processes. This deficiency is remedied in this replication. Finally, Hall's assumption that the low-persuasion voices contained fewer nonverbal cues seems erroneous. Cues may have been less expressive or combined in different ways, but the voices

contained no fewer vocal elements (for example, pitch, tempo, fluency, loudness). This means that some other explanation is needed.

Expectancy Theory

An alternative explanation that is consistent with Hall's findings but offers a more parsimonious account of receiver cognitive processes comes from expectancy theory (Burgoon, 1978, 1983, 1985; Burgoon, Coker, & Coker, 1986; Burgoon & Jones, 1976; Burgoon, Stacks, & Woodall, 1979; Burgoon, Cohen, Miller, & Montgomery, 1978; Miller & Burgoon, 1979). The theory posits that people hold expectations about the nonverbal behaviors of others. Violations of those expectations activate and redirect attention to source characteristics and to interpretation of the violation. Source valence, referred to as *reward*, affects whether the violation is interpreted as a positive or negative violation. Positive violations produce greater compliance and negative violations produce less compliance. Research to date has demonstrated that highly rewarding communicators (for example, those who are more physically attractive, have higher status, give positive feedback, or have more task expertise) may actually achieve better communication outcomes, such as compliance, by engaging in certain types of violations than by conforming to expected, normative behavior (Buller, 1986; Burgoon, 1983; Burgoon & Aho, 1982; Burgoon, Stacks, & Burch, 1982; Burgoon et al., 1979; Stacks & Burgoon, 1981). Conversely, nonrewarding communicators are more likely to have their violations labeled negatively and to achieve less favorable outcomes with violations than with conformity to expectations.

The key to whether a violation is labeled positively or negatively depends on (a) the reward level of the communicator, (b) the range of interpretations that can be assigned to the violation, and (c) the evaluation of the interpreted act. If a behavior is ambiguous and can have multiple interpretations assigned to it, the reward level of the communicator will affect whether positive or negative meanings are selected. The more rewarding the communicator, the more favorable the interpretations. For example, a shift to a very close conversational distance may be interpreted as affiliative when committed by a rewarding communicator but as aggressive when committed by a nonrewarding communicator. The reward value will also affect the evaluation of the act. An affiliative overture may be welcome from a well-liked communicator but unwelcome from a disliked one. The net result is a labeling of the violation as a positive or negative one.

Applied to Hall's data, it could be argued that good and poor decoders differed in how they labeled the voice patterns in such a way that good decoders treated the pleasant voices as a positive violation, and hence complied more, and poor decoders treated the pleasant voices as a negative violation (that is, excessively affiliative or pushy) and complied less. Before an expectancy interpretation can be applied to vocal behavior, however, it must be demonstrated that (1) vocal expectations or norms exist, (2) changes in vocal cues like those in Hall's experiment violate these expectations, (3) multiple interpretations of vocal behaviors are possible, and (4) systematic differences in source valence (reward) are identifiable among communicators.

Researchers working with speech accommodation theory (Giles, 1980; Giles & Smith, 1979; Street & Giles, 1982; Thakerar & Giles, 1981) provide evidence of vocalic norms involving speech rate (Putman & Street, 1984; Smith, Brown, Strong, & Rencher, 1975; Street, 1984; Street & Brady, 1982), response latency (Street, 1982), pause duration (Jaffe & Feldstein, 1970; Welkowitz & Feldstein, 1969), interaction length (Stang, 1973), and overall accent (Giles, 1973; Ryan, 1979; Thakerar & Giles, 1981). In particular, preference zones for speech rate equivalent to normative and nonnormative ranges of vocal behavior (Street & Brady, 1982; Street & Giles, 1982) exist. The size of zones is contingent upon the receiver's perceptions and expectations of the source (Cappella & Greene, 1982; Street & Giles, 1982), and shifts between zones are ambiguous when situational factors are not present to account for them. Thus vocalic norms seem to exist; violations of these norms can be ambiguous, lending themselves to multiple interpretations.

Voices encoded by Hall's callers may have violated expectations. That is, the low-persuasion condition, which was reserved and business-like, may have been the normative, expected voice for a telephone interviewer. If so, the pleasant and expressive voice in the high-persuasion condition may have been a violation of this expectation.

Specification of reward value is the remaining and most difficult assumption to meet. To apply the expectancy model to Hall's results requires arguing that good and poor decoders hold different initial perceptions of the source, that is, good decoders have a generalized perception of other communicators as relatively rewarding, and poor decoders regard them as relatively unrewarding. This shifts the reward variable from being an objectively measurable source characteristic to a

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receiver perception. Admittedly, this is a different interpretation of the reward variable from those prior tests of the expectancy model, but there is some evidence to justify its use.

Research on correlates of nonverbal sensitivity suggests that differential perceptions of source reward may occur. Good decoders tend to be more popular (Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979), affiliative, and interpersonally supportive (Rosenthal & DePaulo, 1979). Conversely, poor decoders tend to experience more social anxiety (Rosenthal & DePaulo, 1979). This suggests that good decoders may be more likely to have a positive evaluation bias so that they see other, unfamiliar communicators as attractive and credible (in expectancy theory terminology, rewarding). On the other hand, poor decoders may be inherently more suspicious and anxious about other communicators and see unfamiliar communicators as unattractive and noncredible (unrewarding). Thus a good decoder should react favorably to an increase in vocal pleasantness, regarding such a vocal tone as more friendly, affiliative, and involved, and hence a positive violation. This should result in greater compliance compared to the neutral voice. Conversely, poor decoders should label an increase in pleasantness as a negative violation and hence should comply less. This is consistent with Hall's argument that poor decoders show reactance in a pleasant voice condition, complying less because they are "put off" by pleasant nonverbal behavior. Thus the following hypothesis was formulated:

> A pleasant voice produces more compliance among good decoders, whereas a neutral voice produces more compliance among poor decoders.

To this point, the expectancy model makes the same predictions as Hall, but from a somewhat different explanatory framework. What is left unanswered is whether the predicted patterns are linear or nonlinear. The addition of a third vocal level—one that represents the extreme negative end of the pleasantness continuum—raises two alternatives from an expectancy perspective. If, as with some other nonverbal behaviors, a hostile voice carries some ambiguity, it could be interpreted as a positive violation by good decoders (producing more compliance) and a negative violation by poor decoders (producing less compliance). It is more likely, however, that the number of vocal cues involved makes the meaning of such a voice unequivocal, which would make it a negative violation for both good and poor decoders. This would produce a linear pattern for good decoders (more pleasantness yielding more compliance) and a nonlinear pattern for poor decoders

(both pleasant and hostile violations producing less compliance than the neutral condition). Because the interpretation given to hostile vocal cues is an empirical question not answered in previous research, the effect of this vocal condition was posed as a research question:

> What is the effect of a hostile voice, relative to neutral and pleasant voices, among good and poor decoders?

METHOD

Wave I:
Respondent and Encoder Pretesting

Respondent pretesting. A group of 272 undergraduates recruited from a basic communication course at a large midwestern university was pretested on (1) vocal decoding ability, (2) need for affiliation, (3) sensitivity to rejection, and (4) communication reticence. These pretested participants served as respondents in the experimental and follow-up surveys.

Decoding ability was measured using the 40-item vocal portion of the Profile of Nonverbal Sensitivity (PONS) (Rosenthal et al., 1979). Good and poor decoding groups were created using a median-split procedure (median = 26.87, alpha reliability r = .14). Previous reliability of the audio PONS reported by Rosenthal et al. (1979, p. 74) was r = .68. However, in this investigation the audio PONS produced an extremely low alpha reliability of r = .14 and split-half reliability of r = .22. These reliability coefficients are not very different from those reported by Rosenthal et al., as the r = .68 reliability was produced by the Spearman-Brown formula to equate the 40-item audio PONS to the 220-item full PONS. Working the formula backwards produces a very low reliability of r = .28.

Because the replication of Hall's work necessitated using the PONS, the scale was subjected to exploratory factor analysis (Hunter, Cohen, & Nicols, 1975) to see if reliability could be improved through use of a multifactor scale. Two factors were produced by this analysis with alpha reliabilities of .46 and .38. Factor loadings, however, were low; primary loadings did not exceed .50. Tests of internal consistency and parallelism (Hunter, 1977) failed to eliminate items from the factors.[2]

It was not clear, conceptually, why the two factors existed. Neither factor contained more dominant-submissive or positive-negative correct responses or more randomized-spliced or content-filtered items than the other, as Rosenthal et al. (1979) reported. The means and

standard deviations of the items also did not differ greatly, ruling out the possibility that the PONS was functioning as a Guttman scale. The audio PONS, therefore, was used as a unidimensional scale following Rosenthal et al. (1979). (Two items were dropped due to scoring error.)

Affiliativeness and interpersonal supportiveness were measured using a 26-item need for affiliation scale and a 22-item sensitivity to rejection scale developed by Mehrabian and Ksionsky (1974; coefficient alpha reliabilities of r = .71 and .67, respectively). Social anxiety, in the form of communication reticence, was measured by Burgoon's (1976) 20-item, 2-factor Unwillingness-to-Communicate Scale: approach-avoidance (alpha = .85) and reward (alpha = .70).

Encoder pretesting and training. A group of 48 potential interviewers (upper-division undergraduate students) was instructed to read a neutral sentence while attempting to encode eight different scenarios that differed in dominance-submission and positivity-negativity.[3] The tape-recorded statements were decoded by undergraduate judges in eight groups ranging in size from 16 to 32 ($\bar{X}$ = 21.6, N = 173), using the PONS procedure of choosing between two possible scenarios. Ten encoders who scored above the median (5.01) were chosen as interviewers, as the interest in testing the decoding effect dictated that the highest-quality voice conditions be created.

All interviewers attended a training session where they were instructed in neutral voice presentation and interviewing techniques. Interviewers then learned to create pleasant and hostile vocal patterns by imitating sample vocal patterns, created by having three experienced interviewers record pleasant, hostile, and neutral vocal patterns, after coaching from the experimenter. The neutral voice was consistent in tone, except when slight emphasis was placed on key words in questions. This voice was flat, though not monotone. Pacing was even and of moderate speed. Enunciation was clear and precise. The pleasant voice was warmer, included more tone variation, had a slightly higher overall pitch and was slightly slower than the neutral voice. The enunciation of words was not as precise. Finally, the hostile voice was more tense, had a lower overall pitch, and was faster than the neutral voice. Enunciation was very precise.

Wave II:
Experimental Interviews

The 10 interviewers each interviewed 21 of the research participants who had been pretested in Wave I on vocal decoding ability, need for affiliation, sensitivity to rejection, and communication reticence (N = 206; four were lost due to recording errors). The survey assessed the respondent's willingness to donate time to communication research, embedded within questions measuring attitudes toward and actual experiences with research participation.

Participants were randomly assigned to interviewers and voice conditions (N = 70 hostile, 68 neutral, 68 pleasant). Each interviewer completed the neutral voice condition first, to provide a baseline vocal pattern for the persuasive manipulations. The order of the pleasant and hostile conditions was alternated across interviewers.

Wave III:
Follow-Up Interviews

A follow-up neutral voice telephone survey was administered to each respondent immediately after the experimental survey (N = 177; 59 male, 118 female). Interviews were conducted by eleven follow-up interviewers working in a separate room. The survey measured perceptions of the interviewer's credibility, characteristics of the voice tone used, and the perceived relational meanings of the vocal behavior.

A 15-item semantic differential scale was used to measure source credibility (McCroskey, Hamilton, & Weiner, 1974; McCroskey, Jensen, & Valencia, 1973). Principal-components factor analysis revealed four factors with eigenvalues greater than 1.00, accounting for 70% of the variance. An item was retained on a factor if its loading on that factor exceeded .50 and its loadings on the remaining factors did not exceed .30. The sociability and character factors reported by McCroskey and his associates (1973, 1974) collapsed into a single factor. All four factors attained high alpha reliability (sociability/character r = .89, extraversion r = .74, competence r = .76, composure r = .79).

Eight semantic differential items were used to assess whether the vocal tones violated expectations (expected-unexpected, appropriate-inappropriate, usual-unusual, not distracting-distracting) and how positively (good-bad, positive-negative, inoffensive-offensive, unbiased-biased) they were perceived. Principal-axes factor analysis produced a unidimensional scale (coefficient alpha reliability r = .87).

A 24-item relational messages scale developed by Burgoon and Hale (in press) was used to measure respondents' perceptions of the interviewers' implicit verbal and nonverbal messages about the nature of their interpersonal relationship. This scale includes items representing twelve different themes of relational communication (Burgoon & Hale,

1984). The clusters of items selected as fitting a four-factor orthogonal solution achieved satisfactory coefficient alpha reliability after dropping two items: emotional arousal/composure/formality r = .71, intimacy r = .70, nonimmediacy r = .74, dominance/submission r = .76.

RESULTS

Manipulation and Assumption Checks

Decoder predispositions. Application of the concept of reward from the expectancy model required that good decoders differ on their initial perceptions of the reward value of unfamiliar communicators. Such differences were not apparent. Need for affiliation (r = .00), sensitivity to rejection (r = .05), and communication reticence (approach-avoidance: r = .01; reward: r = .01) did not significantly correlate with decoding ability.

Voice manipulation. The interviewer's voice was recorded during each interview (N = 168; 42 were lost due to technical and recording errors) and evaluated on eight semantic differential scales: dominant-submissive, consistent-inconsistent, expressive-inexpressive, fast-slow, anxious-calm, natural-stiff, cold-warm, and pleasant-unpleasant. A group of 146 undergraduate judges was divided into ten groups ($\bar{X}$ = 14.6 judges/group). Each group listened to all the interviews performed by one interviewer ($\bar{X}$ = 17 voices/group). The eight ratings formed pleasantness and assertiveness factors. Analysis of variance and Scheffé tests revealed that the pleasant condition was seen as more pleasant, $F(2, 179) = 109.96$, $p < .05$, and less assertive, $F(2, 179) = 41.43$, $p < .05$, and the hostile condition was seen as less pleasant and more assertive. The neutral condition was seen as neutral in pleasantness and low in assertiveness. These results confirmed that three separate voices were produced.

Hypothesis and Research Question

The hypothesis was tested by (1) analysis of variance[4] and (2) trend analysis. The disordinal interaction between decoding ability and voice condition was significant (linear $F[1, 199] = 5.13$, $p < .05$; quadratic $F[1, 199] = 1.32$, $p > .05$), and the main effects of decoding ability ($F[1,199] = 0.63$, $p > .05$) and voice condition ($F[2, 199] = 1.34$, $p > .05$) were not significant. Cell means and the residuals show that good decoders donated fewer hours in the neutral condition and more in the pleasant, whereas poor decoders donated more hours in the neutral condition and fewer in the pleasant (Table 1). These results confirmed the hypothesis and were consistent with Hall's findings, assuming the neutral condition in the present study was comparable to Hall's low-persuasion condition.

Three alternatives were posed for the hostile voice condition, with the choice of interpretations contingent on receiver predispositions, relational communication, vocal characteristics, and credibility evaluations of the hostile voice. The lack of significant correlations between receiver predispositions and vocal decoding ability failed to substantiate differential perceptions of sources by good and poor decoders. Nevertheless, the compliance differences between good and poor decoders in the hostile condition suggest there may be differences in the way they label and/or evaluate violations (Table 1). Relational meanings, credibility, and vocal characteristics ratings by good and poor decoders therefore were examined to see how the respondents labeled the three voice conditions.

Voice condition had a main effect on relational messages of intimacy

TABLE 1
Cell Means and Residuals on Hours Donated

	Voice Conditions			
	Hostile	*Neutral*	*Pleasant*	*Total*
Means				
Poor decoders	6.97 sd = 5.17 (29)	6.16 sd = 4.12 (31)	5.55 sd = 3.51 (29)	6.22 sd = 4.31 (89)
Good decoders	6.15 sd = 4.79 (41)	5.57 sd = 3.77 (37)	8.33 sd = 5.60 (39)	6.69 sd = 4.90 (117)
Total	6.49 sd = 4.93 (70)	5.84 sd = 3.92 (68)	7.15 sd = 4.98 (68)	6.49 sd = 4.65 (206)
Residuals[a]				
Poor decoders	0.75	0.59	−1.33	
Good decoders	−0.54	−0.47	0.98	

NOTE: Cell sizes are in parentheses.
a. Residuals were calculated following Keppel (1982, p. 189).

TABLE 2
Means and Residuals on Relational Message, Credibility and Vocal Characteristics Evaluations

Respondent Evaluations	*Voice Conditions* *Hostile*	*Neutral*	*Pleasant*	*Total*
RELATIONAL MESSAGES				
Significant Interactions				
Intimacy				
Means				
Poor decoders	14.83 sd = 4.20 (23)	15.46 sd = 4.62 (28)	16.29 sd = 3.34 (24)	15.53 sd = 4.10 (75)
Good decoders	11.77 sd = 4.13 (35)	17.50 sd = 4.90 (34)	17.16 sd = 4.48 (33)	15.42 sd = 5.20 (102)
Total	12.98 sd = 4.39 (58)	16.48 sd = 4.85 (62)	16.79 sd = 4.03 (57)	15.47 sd = 4.76 (177)
Residuals[a]				
Poor decoders	1.79	−1.08	−0.56	
Good decoders	−1.16	1.07	0.42	
Emotional Arousal				
Means				
Poor decoders	15.00 sd = 3.95 (23)	11.93 sd = 3.92 (28)	15.54 sd = 5.64 (24)	14.03 sd = 4.78 (75)
Good decoders	17.09 sd = 5.32 (35)	13.12 sd = 3.72 (34)	12.39 sd = 3.68 (33)	14.25 sd = 4.76 (102)
Total	16.26 sd = 4.90 (58)	12.58 sd = 3.82 (62)	13.72 sd = 4.82 (57)	14.15 sd = 4.77 (177)
Residuals				
Poor decoders	−1.14	−0.53	1.94	
Good decoders	0.73	0.44	−1.43	

(continued)

TABLE 2 Continued

Respondent Evaluations	*Voice Conditions* *Hostile*	*Neutral*	*Pleasant*	*Total*
Significant Main Effects[b]				
Nonimmediacy	22.54a sd = 4.27 (58)	18.42b sd = 5.25 (62)	17.82b sd = 4.26 (57)	
Dominance	17.33a sd = 5.28 (58)	13.76b sd = 5.00 (62)	15.23b sd = 5.56 (57)	
CREDIBILITY[c]				
Sociability/character	−0.63a sd = 0.84 (58)	0.14b sd = 0.80 (62)	0.44b sd = 0.88 (57)	
Composure	−0.33a sd = 0.95 (58)	0.13b sd = 0.89 (62)	0.16b sd = 0.80 (57)	
Extraversion	0.19 sd = 1.08 (58)	−0.20 sd = 0.90 (62)	−0.02 sd = 0.80 (57)	
Competence	0.01 sd = 1.03 (58)	−0.05 sd = 0.73 (62)	0.02 sd = 0.70 (57)	
VOCAL CHARACTERISTICS	22.37a sd = 7.48 (57)	27.77b sd = 5.44 (61)	26.78b sd = 6.16 (55)	

NOTE: Cell sizes are in parentheses.
a. Residuals were calculated following Keppel (1982, p. 189).
b. Main effect means with different letters are significantly different by Scheffé test.
c. Credibility scores were created by factor score weighted sums, $\bar{X} = 0.00$.

(F [1, 177] = 14.11, $p < .05$), emotional arousal (F [1, 177] = 10.73, $p < .05$), nonimmediacy (linear F [1, 177] = 29.86, $p < .05$; quadratic F [1,177] = 5.82, $p < .05$), and dominance (linear F [1, 177] = 4.62, $p < .05$; quadratic F [1, 177] = 9.13, $p < .05$). The hostile voice was rated as nonintimate, tense, nonimmediate, and dominant, whereas the pleasant voice was seen as intimate, relaxed, immediate, and submissive by both decoder groups (Table 2). Disordinal interactions, however, were

obtained between decoding ability and voice condition in the perceptions of intimacy (linear $F[1, 177] = 5.62$, $p < .05$; quadratic $F[1, 177] = 5.13$, $p < .05$) and emotional arousal (linear $F[1, 177] = 9.73$, $p < .05$; quadratic $F[1,177] = 1.50$, $p > .05$), suggesting that good and poor decoders did not totally share interpretations of the three voices on these two dimensions. Good decoders appeared to be more sensitive to the intimacy dimension of the voice than poor decoders. Good decoders perceived the pleasant voice as more intimate and the hostile voice as more nonintimate than poor decoders. In other words, poor decoders discriminated less among the three voices on intimacy (Table 2). On emotional arousal, the decoders diverged primarily on the pleasant voice. Good decoders saw it as relatively relaxed and poor decoders saw it as somewhat tense.

Voice condition had a main effect on three of the credibility dimensions: Interviewers employing hostile voices were rated as lacking sociability/character (linear $F[1, 177] = 47.39$, $p < .05$; quadratic $F[1, 177] = 2.22$, $p > .05$), less composed (linear $F[1, 177] = 8.64$, $p < .05$; quadratic $F[1, 177] = 2.43$, $p > .05$), and extraverted (linear $F[1, 177] = 1.37$, $p > .05$; quadratic $F[1, 177] = 3.83$, $p < .05$). Perceptions of inteviewer competence did not differ significantly across conditions or decoding ability (Table 2).

There was also a main effect for voice condition on evaluations of the pleasantness of the voice and the degree to which the voice violated expectations (linear $F[1, 166] = 13.58$, $p < .05$; quadratic $F[1, 166] = 9.86$, $p < .05$). The hostile voice was unpleasant and unexpected, whereas the pleasant voice was pleasant and expected (Table 2).

DISCUSSION

This experiment attempted to replicate Hall's (1980) unpredicted interaction between decoding ability and voice tone on compliance. The results in the neutral and pleasant conditions duplicated Hall's findings and supported the central hypothesis of this investigation. The occurrence of a similar interaction in two independent experiments is evidence that this interaction is not a product of sampling error.

A key issue in this experiment was the applicability of an expectancy theory explanation for the interaction. It was surmised that in Hall's original experiment the low-persuasion condition (equivalent to the current neutral condition) was the expected voice pattern and that the high-persuasion condition (equivalent to the current pleasant condition) constituted a violation of vocalic expectations. Reactions of the

respondents in this study suggest that if the pleasant voice was a violation, it was a mild one at best. Respondents rated the pleasant voice similar to the neutral voice on pleasantness and degree to which it violated expectations. The hostile voice was less expected by respondents and as such can be considered a stronger violation than the pleasant voice.

Given some violation of expectations in this study, expectancy theory predicted that compliance depended on (1) interpretations assigned to nonverbal cues that violate expectations and (2) the valence (positive or negative) assigned to the nonverbal violation. That is, if an unexpected voice was perceived to be dominant, compliance would be a function of both this dominance interpretation and whether the respondent saw a dominant voice as a positive or negative act.

From the relational messages ratings in Wave III, good and poor decoders seem largely to share interpretations of the vocalic cues in the three voice conditions. The hostile voice was perceived to be nonintimate, tense, nonimmediate, and dominant, whereas the pleasant voice was seen as intimate, relaxed, immediate, and submissive. However, decoding groups displayed some dissimilarity in their interpretations of intimacy and emotional arousal. As Hall suggested, good decoders made interpretations consistent with the intent of the interviewers: pleasant voices were seen as intimate and relaxed, and hostile voices were seen as nonintimate and tense. Perceptions by poor decoders are less in line with the intent of the interviewers. However, rather than displaying reactance to the presence of emotional cues as Hall speculated, poor decoders seem to discriminate the voices less on intimacy than good decoders and provide different arousal interpretations than good decoders to pleasant voices: The pleasant voices were seen as relatively tense by poor decoders and relatively relaxed by good decoders.

Once interpretations of nonverbal violations are made, the expectancy model predicts that communicators will evaluate the nonverbal act and this evaluation will determine communication outcomes. Source reward is a factor that in previous research has been shown to affect evaluations. In the present study, it was suggested that good and poor decoders comply differently to the voice conditions because they have different predispositions toward unfamiliar communicators, causing differential perceptions of source reward. Need for affiliation, sensitivity to rejection, and communication reticence failed to correlate with decoding ability; this ruled out source reward as a factor influencing evaluations of the nonverbal violations in this experiment.

The picture becomes even more clouded when one considers the credibility perceptions provided by respondents. It could be argued that perceptions of the unfamiliar interviewers' credibility were at least partially a product of evaluations of their vocalic patterns: Positive evaluations produced greater credibility and negative evaluations produced lesser credibility. If such a relationship between evaluations and credibility perceptions existed, the higher sociability/character and composure ratings in the pleasant condition imply that these voices were evaluated positively, whereas the lower sociability/character and composure ratings in the hostile condition suggest that these voices were evaluated negatively. Such evaluations would predict the compliance pattern obtained for the good decoders, but would not account for the reversal in compliance by poor decoders.

Another possibility that would account for the reversal in compliance links evaluations of vocalic violations to preferences for vocalic patterns. Accommodation theory in the speech style arena predicts that evaluations of vocalic cues are a function of preferences for speech styles, particularly preferences for the speech style typically encoded by the receiver. For instance, a receiver who normally speaks at a relatively slow rate will evaluate speakers with equally slow rates more positively (more benevolent) and speakers with faster rates more negatively. Conversely, a receiver who typically speaks relatively fast will evaluate speakers with slower rates more negatively and speakers with equally fast rates more positively (Giles, 1980; Street & Giles, 1982).

Personality correlates of nonverbal sensitivity suggest that good and poor decoders may have different preferences for nonverbal behaviors. Good decoders report being more affiliative and interpersonally supportive than poor decoders, who experience more social anxiety (Rosenthal & DePaulo, 1979). These traits may be manifested in decoders' own nonverbal display and in their preferences for nonverbal cues encoded by conversational partners. Highly affiliative good decoders may employ positive, affiliative, composed, and sociable voices when attempting to gain compliance from others and prefer such voices when others attempt to gain compliance from them. Good decoders in this experiment, therefore, may have complied more with interviewers employing pleasant voices because they preferred the pleasant voice tones. On the other hand, more socially anxious poor decoders may encode assertive, aloof, dynamic, and unsociable voices when attempting to gain compliance and prefer such voices when others attempt to gain compliance from them. Hence in this study they complied more with interviewers using hostile voices that poor decoders preferred. Admittedly, the role of vocal style preferences in the evaluation of vocalic violations is speculative. However, if future research confirms this speculation, then an expectancy model that includes receiver factors along with source variables as mediators of the evaluation process would account for the compliance interaction. Without support for a mediating effect of vocal style preferences, the expectancy model in its present form cannot be applied here and the cause of the compliance interaction remains unresolved.

A final implication of the relational messages perceptions is that scores on the audio PONS may provide an incomplete and possibly erroneous assessment of decoding ability. By design, the audio PONS varies cues along positive-negative and dominance-submission continua. Therefore, it should not be surprising that differences among decoders emerged in ratings of intimacy and emotional arousal, two dimensions that may be equivalent to, or at least highly correlated with, positivity and dominance as manipulated in the audio PONS. Although it is important to assess a communicator's ability to decode vocalic meaning on these two dimensions, Burgoon and Hale's (1984) review of the relational message literature and reactions of respondents in the present study show that decoders interpret nonverbal cues along more than intimacy and emotional arousal dimensions. Further, the current data suggest that although good and poor decoders differ in their interpretations of intimacy and emotional arousal, both decoder groups make the same interpretations of nonimmediacy and dominance. Respondents who were poor decoders of intimacy and emotional arousal messages appear to have been good decoders of nonimmediacy and dominance messages. Hence to conclude that communicators who score low on the audio PONS are inaccurate decoders on all relational dimensions may be erroneous.

The lack of reliability in the audio PONS also creates concern, because it suggests that the data it has provided on sensitivity to vocalic cues contain sizable measurement error. That the scale demonstrates predictive ability in the current study, as well as in previous experiments, is noteworthy. It hardly seems likely that the disordinal interaction between decoding ability and voice condition would occur in two independent experiments purely by chance. Moreover, the decoder differences in the perceptions of intimacy and emotional arousal are evidence that the audio PONS is measuring an interpretation process. However, construct validity is a necessary, but not a sufficient, criterion for accepting the results of the audio PONS.

Efforts must be made to improve the audio PONS or develop a more reliable test before one can be completely confident that it provides an accurate assessment of vocalic sensitivity.

NOTES

1. Throughout this article, *good decoder* indicates a person who scores above the median score on the PONS vocal decoding ability test, and *poor decoder* indicates a person who scores below the median score on this test (see Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979, chap. 3, for normative data).

2. The internal consistency test (Hunter, 1977) involves the creation of a predicted interitem correlation matrix. Predicted correlations are calculated by the formula, $r_{AB} = r_{TA} \times r_{TB}$, where r_{AB} is the correlation between items A and B in factor T, r_{TA} is the factor loading of item A on factor T, and r_{TB} is the factor loading of item B on factor T. If more than 5% of the predicted correlations significantly deviate from the actual interitem correlations (in the present study, $r = .12$, $n = 272$, $p < .05$), items with significant deviations are dropped and the test is repeated until less than 5% of the deviations are significant. The parallelism test involves essentially the same procedure. Predicted correlations are calculated by the formula, $r_{AX} = r_{AT1} \times r_{T1T2} \times r_{XT2}$, where r_{AX} is the correlation of item A in factor T1 with item X in factor T2, r_{AT1} is the factor loading of item A on factor T1, r_{T1T2} is the correlation between factors T1 and T2, and r_{XT2} is the factor loading of item X on factor T2.

3. The neutral sentence encoded in this test was, "I want to let you know what I'm thinking; I hope you understand." The scenarios encoded represented combinations of dominant (D), submissive (S), positive (P), and negative (N) affect: asking for forgiveness (S, N), returning a faulty item to a store (S, N), ordering food in a restaurant (S, P), expressing gratitude (S, P), criticizing someone for being late (D, N), expressing jealous anger (D, N), admiring nature (D, P), and talking to a lost child (D, P). Rosenthal et al. (1979, p. 33) selected these to represent optimal decoding accuracy (75%), halfway between chance (50%) and complete accuracy (100%).

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 main effect deviated only slightly from the total sum of squares for main effects. This indicated the assumption of orthogonality was maintained (Winer, 1971). For the main effect of persuasion condition and interactions involving this variable, power for tests of medium-sized effects was .89 for $f^2 = .05$ ($r^2 = .04$; $r = .20$; df numerator = 2; $p = .05$), .98 for $f^2 = .10$ ($r^2 = .09$; $r = .30$) and .99 for $f^2 = .15$ ($r^2 = .13$; $r = .36$). For the main effect of decoding ability, power for tests of medium-sized effects was .89 for $f^2 = .05$ ($r^2 = .04$; $r = .20$; df numerator = 1; $p = .05$), .99 for $f^2 = .10$ ($r^2 = .09$; $r = .30$), and .99 for $f^2 = .15$ ($r^2 = .13$; $r = .36$). Power coefficients are suggested by Cohen (1977) and Cohen and Cohen (1975).

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