

## DECODING OF INCONSISTENT COMMUNICATIONS<sup>1</sup>

ALBERT MEHRABIAN

AND

MORTON WIENER

*University of California, Los Angeles*

*Clark University*

The present study dealt with inconsistent communication of attitude in 2 components of a message. 3 degrees of attitude (positive, neutral, and negative) communicated in single-word contents were each combined with 3 degrees of attitude communicated in tone of voice. It was found, consistent with the proposed hypothesis, that the variability of inferences about communicator attitude on the basis of information available in content and tone combined is mainly contributed by variations in tone alone. For example, when the attitude communicated in content contradicted the attitude communicated by a negative tone, the total message was judged as communicating a negative attitude. The limitations of the findings, as well as their implications for the double-blind theory of schizophrenia, were discussed.

The present study is concerned with one variant of "implicit attitude" communication. The attitudes under consideration are affective or evaluative in character. One variant of implicit attitude communication, that is, vocal (e.g., tone of voice) and nonverbal (e.g., facial expression, gesture, or postural orientation), has been the object of many studies. Reviews of the literature by Davitz (1964), Mahl and Schulze (1964), Starkweather (1964), and Marsden (1965) indicate that subjects can make reliable judgments of feelings or attitudes on the basis of vocal and nonverbal stimuli. A second variant of implicit attitude communication involves the simultaneous and inconsistent communication of attitudes in two or more components of a message, with each component independently communicating a different degree of positive-negative attitude.

There are no reported experimental investigations of multicomponent inconsistent communications of attitude in which the independent and combined effects of the components were assessed. However, there are a few studies in which consistent two-component communications were investigated. For example, Levitt (1964) and Williams and Sundene (1965) investigated the independent and combined effects of facial and vocal communication of emotions. In the latter study, it was found that all three modes of facial, vocal, and combined facial-vocal communication are recognized in terms of the three

factors of general evaluation, social control, and activity.

In view of the frequent co-occurrence of verbal and nonverbal cues in most communication situations, the understanding of attitude communication requires a study of the interactive effects among such cues. The present experiment was intended as a step in this direction. In the experiment, quantification of the degree of inconsistency between components in a communication was possible only when the two components could be scaled along a common dimension. Thus, the general evaluation dimension obtained in the Williams and Sundene (1965) study was used since it seemed appropriate for the study of attitude communication. The two components were tone and content in a verbal message. Tone refers to those permissible variations of pitch and stress which are linguistically unnecessary; content refers to word meanings.

While the independent effects of content can be assessed through the use of written communications, the effects of tone are somewhat more difficult to obtain. Davitz (1964) reviewed the experimental literature relating to the communication of feelings through tonal variations. In the studies reviewed, the independent effects of tone were obtained either through the use of electronic filters which rendered the content portions of a message incomprehensible, or through the use of the alphabet or numbers as carriers of tone. The former method has the disadvantage of modifying the tonal component of a message in the process of eliminating the content component, while the latter method has the disadvantage of restricting the range of contents on which tone may be superimposed. The methodology of the present experiment was designed to try to circumvent these problems so

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that the same verbal materials could be used to assess the independent effects of tone, the independent effects of content, and the combined effects of tone and content.

Three degrees of attitude (positive, neutral, and negative) in the content of the communications were each combined with three degrees of attitude in the tone of the communications. Thus, with the exception of the positive-content-positive-tone, neutral-content-neutral-tone, and negative-content-negative-tone conditions, all other six conditions involved inconsistency between the tonal and content components of the message. Extrapolating from informal observation of responses to sarcastic attitude communications (i.e., the dominance of the tonal component over the content component), it was expected that in these six instances the effects of tone rather than those of content would determine the addressee's interpretation of the total message. It was therefore hypothesized that for the nine Tone  $\times$  Content conditions the effects of tone are significantly greater than the effects of content, indicating that tone and content do not contribute to the interpretation of the total message in proportion to their independent effects.

#### METHOD

##### *Subjects*

Forty-five subjects were used in the initial selection of the positive-, neutral-, and negative-affect communicating words (i.e., contents). A second group of 30 subjects was used in the remaining portion of the study. All 75 subjects were University of California undergraduates.

##### *Materials*

The positive-, neutral-, and negative-affect communicating words were selected by the following procedure. The words DEAR, GREAT, HONEY, LOVE, and THANKS were initially selected as likely positive-attitude communicating contents. The words MAYBE, OH, REALLY, SO, and WHAT were selected as likely neutral-attitude communicating contents. The words BRUTE, DON'T, NO, SCRAM, and TERRIBLE were selected as likely negative-attitude communicating contents. A group of 45 subjects received one page of instructions and a 15-page booklet, each page of which contained one of the words noted above and a 12-centimeter scale designated "positive" and "negative" at its poles. The order in which the 15 words were presented to each subject was randomized. Also, for each word, the positioning of the positive and negative poles was counterbalanced. The instructions were as follows:

Each of the words in your booklet can be imagined as having been said by person X to person Y (e.g., X says to Y, "later"). For each word, indicate on the scale what you think X's attitude is towards Y. On the scale, "positive"

refers to liking, high evaluation, or preference for Y, while "negative" refers to disliking, low evaluation, or lack of preference for Y.

The means and sample standard deviations of judgments of degree of positive attitude were as follows on a -6 (i.e., most negative) to +6 (i.e., most positive) scale for the assumed positive words: HONEY (3.21, 2.24), THANKS (3.27, 2.02), DEAR (3.27, 2.51), GREAT (3.62, 1.90), LOVE (4.48, 1.76); for the assumed neutral content words: MAYBE (-.43, 1.94), REALLY (.39, 1.83), OH (-.04, 2.10), SO (-1.59, 1.75), WHAT (-.49, 1.37); for the assumed negative words: DON'T (-2.86, 2.24), BRUTE (-3.12, 2.12), TERRIBLE (-3.21, 2.23), NO (-2.38, 2.08), SCRAM (-4.33, 1.75). On the basis of these findings, the words HONEY, THANKS, and DEAR were selected as comparable instances of positive contents; the words MAYBE, REALLY, and OH were selected as comparable instances of neutral contents; and the words DON'T, BRUTE, and TERRIBLE were selected as comparable instances of negative contents.

Two female speakers were employed to read each of the nine selected words with each of the three positive, neutral, and negative tones. For the positive-, neutral-, and negative-tone conditions, the speakers were instructed to say the words, irrespective of contents, in such a way as to convey an attitude of liking, high evaluation, or preference; a neutral attitude, that is, neither liking nor disliking; and an attitude of disliking, low evaluation, or lack of preference, respectively, towards the target person.<sup>2</sup> All possible combinations of two speaker conditions, three tone conditions, three content conditions, and three instances of each content condition were recorded on tape.

##### *Procedure*

A random order of the 54 conditions was administered to each subject. An individual subject received only one of the following three instructions:

We are interested in finding out how well you can judge the feelings of a speaker towards the person whom she is addressing. You are to imagine each one of the following words as being said by one person, the speaker, to another and you are to judge what the speaker's attitude is towards her addressee [attend to content and tone instructions] using all the information available; [attend to content only instructions] using only the information contained in the meanings of the words and ignore the information contained in the tone; [attend to tone only instructions] using only the information contained in the tone and ignore the information contained in the meanings of the

<sup>2</sup> It may be indicated that the object of this experiment was not the investigation of the problem as to what types of pitch and stress patterns correspond to positive-, neutral-, and negative-attitude communicating tone. The problem was, rather, given that tone is judged as having any one of these positive-, neutral-, or negative-attitude communicating qualities, what are its interactive effects with positive-, neutral-, and negative-attitude communicating contents.

words. Record your judgments on the answer sheet which has been provided for you. Each time you hear the speaker say a word, we would like you to judge the degree of the speaker's positive versus negative attitude towards the addressee. "Positive" refers to liking, preferring or having high evaluations and "negative" refers to disliking, not preferring or having low evaluations of the addressee.

Use the scale provided on this instruction sheet to indicate your estimate of speaker attitude in each case.

A scale numbered -3 through +3, extending from a pole designated negative to a pole designated positive, was inserted at this point, and the remaining instructions explained the use of the scale and recording of judgments on an answer sheet which was also provided.

Ten subjects received the instructions to use "all the information available," 10 subjects received the instructions to use "only the information contained in the meanings of the words and ignore the information contained in the tone," and 10 subjects received the instructions to use "only the information contained in the tone and ignore the information contained in the meanings of the words." These three sets of instructions and their accompanying methodology were designed to make possible an independent evaluation of the contribution of tone and content together, content alone, and tone alone, respectively, in the same spoken medium of communication and through the use of identical materials.

## RESULTS

Each subject recorded 54 responses which were three replications of each of the 2 Speaker  $\times$  3 Content  $\times$  3 Tone conditions. Thus, for each Speaker  $\times$  Tone  $\times$  Content combination, three measures were obtained from each subject corresponding to the three words in the particular content category involved (e.g., the words MAYBE, REALLY, and OH in the neutral content category). These response scores, which had a possible range of from -3 to +3, were analyzed in three separate analyses, one for each of the three types of instructions.

The means of the nine Tone  $\times$  Content conditions obtained for Speaker A and Speaker B communications under each of three instruction conditions are given in Tables 1 and 2, respectively.

The data obtained from the subjects who were instructed to use only the information contained in the meanings of the words were analyzed in a 2  $\times$  3  $\times$  3 factorial design, replicated over subjects, in which there were 2 speaker, 3 tone, and 3 content conditions. There was a significant effect due to content,  $F(2, 18) = 39.96$ ,  $p < .01$ . The effects due to tone,  $F(2, 18) = 3.51$ ,  $p < .1$ , and Speaker  $\times$  Tone,  $F(2, 18) = 3.07$ ,  $p < .1$ , approached significance.

TABLE 1  
DEGREE OF INFERRED POSITIVE ATTITUDE FOR SPEAKER A AS A FUNCTION OF THE NINE CONTENT  $\times$  TONE STIMULUS CONDITIONS AND INSTRUCTIONS

Instructions	Content	Tone		
		Negative	Neutral	Positive
Use content only	Negative	-1.33	-1.00	-0.67
	Neutral	-0.47	-0.17	0.35
	Positive	1.03	1.30	1.70
Use tone only	Negative	-2.47	-0.03	1.40
	Neutral	-2.07	-0.67	1.73
	Positive	-1.37	0.17	1.63
Use tone and content	Negative	-1.77	0.30	1.21
	Neutral	-1.67	-0.40	1.10
	Positive	-0.87	0.40	1.10

For Speaker A communications, the Newman-Keuls method yielded significant differences at the .05 level for all three comparisons among means of the three content categories for each tone level. For example, the negative-tone-negative-content cell mean was less than the negative-tone-positive-content and the negative-tone-neutral-content cell means. The negative-tone-neutral-content cell mean was also less than the negative-tone-positive-content cell mean. Similarly, judgments based on Speaker B communications yielded significant differences at the .05 level for all three comparisons among the means of the three content categories for each tone level. Thus, the independent effects due to content were unambiguous for both Speaker A and Speaker B communications.

A similar analysis of the data obtained from

TABLE 2  
DEGREE OF INFERRED POSITIVE ATTITUDE FOR SPEAKER B AS A FUNCTION OF THE NINE CONTENT  $\times$  TONE STIMULUS CONDITIONS AND INSTRUCTIONS

Instructions	Content	Tone		
		Negative	Neutral	Positive
Use content only	Negative	-1.03	-1.00	-0.80
	Neutral	0.07	0.13	0.53
	Positive	0.67	1.63	1.63
Use tone only	Negative	-1.60	0.47	0.83
	Neutral	-0.43	0.20	1.53
	Positive	-1.13	0.73	1.77
Use tone and content	Negative	-0.83	0.20	0.83
	Neutral	-0.40	0.03	0.83
	Positive	-1.03	0.87	1.43

the subjects who were instructed to use only the information contained in the tone of the words indicated significant effects due to speaker,  $F(1, 9) = 21.18, p < .01$ ; tone,  $F(2, 18) = 178.42, p < .01$ ; content,  $F(2, 18) = 5.58, p < .05$ ; Speaker  $\times$  Tone,  $F(2, 18) = 14.54, p < .01$ ; Tone  $\times$  Content,  $F(4, 36) = 7.09, p < .01$ ; and Speaker  $\times$  Tone  $\times$  Content,  $F(4, 36) = 4.50, p < .01$ . Separate analyses for each speaker level indicated the following effects: For Speaker A, there was significance due to tone,  $F(2, 18) = 191.30, p < .01$ ; content,  $F(2, 18) = 6.94, p < .01$ ; and Tone  $\times$  Content,  $F(4, 36) = 4.61, p < .01$ . For Speaker B, there was significance due to tone,  $F(2, 18) = 77.23, p < .01$ ; content,  $F(2, 18) = 3.70, p < .05$ ; and Tone  $\times$  Content,  $F(4, 36) = 6.48, p < .01$ . Furthermore, for Speaker A communications, the Newman-Keuls method yielded significant differences at the .05 level for all three comparisons among the means of the three tone categories for each content level. For Speaker B communications, the Newman-Keuls method yielded significant differences at the .05 level for all three comparisons among the means of the three tone categories for the neutral- and positive-content levels. For the negative-content level, however, while the negative-content-negative-tone cell mean was significantly less than the negative-content-positive-tone and negative-content-neutral-tone cell means, the latter was not significantly less than the negative-content-positive-tone cell mean. Thus, for Speaker A communications, the independent effects of tone were unambiguous. However, for Speaker B communications, the effects of tone were weaker than those of Speaker A (as indicated by the significant Speaker  $\times$  Tone interaction obtained in the overall analysis), and the effects for Speaker B were significantly different in only eight of the nine comparisons of cell means.

The effects due to content which were obtained under "use tone only" instructions, although incidental, require some consideration. These effects were different for different tone levels of each speaker. Moreover, comparisons of cell means indicated only a few significant differences. For Speaker A, the Newman-Keuls method yielded three out of nine significant differences at the .05 level. One of these effects was in a direction opposite to what might have been expected: the neutral-tone-negative-content cell mean was greater than the neutral-tone-neutral-content cell mean. For Speaker B, the Newman-Keuls method also yielded three out of nine significant differences at the .05 level. Once again, one of these effects was in a direction opposite to what might have been expected: the negative-tone-positive-content cell mean was

less than the negative-tone-neutral-content cell mean. In brief, the effects due to content which were obtained under "use tone only" instructions were not only weak, but also somewhat inconsistent.

Analysis of the data obtained from the subjects who were instructed to use all the information available indicated significant effects due to speaker,  $F(1, 9) = 10.55, p < .01$ ; tone,  $F(2, 18) = 30.57, p < .01$ ; Speaker  $\times$  Tone,  $F(2, 18) = 6.00, p < .01$ ; and Speaker  $\times$  Tone  $\times$  Content,  $F(4, 36) = 4.78, p < .01$ . Separate analyses for each speaker level indicated the following effects. For Speaker A, there was significance due to tone,  $F(2, 18) = 36.98, p < .01$ . For Speaker B, there was significance due to tone,  $F(2, 18) = 17.77, p < .01$ ; and Tone  $\times$  Content,  $F(4, 36) = 4.22, p < .01$ . Furthermore, for Speaker A communications, the Newman-Keuls method yielded significant differences at the .05 level among the means of the three tone categories for each content level. For Speaker B communications, the Newman-Keuls method yielded significant differences at the .05 level among the means of the three tone categories for the negative- and positive-content levels. For the neutral-content level, however, the neutral-content-negative-tone cell mean was less than the neutral-content-positive-tone cell mean, but did not differ significantly from the neutral-content-neutral-tone cell mean, while the latter was less than the neutral-content-positive-tone cell mean.

The above results may be summarized as follows: For Speaker A communications, under "use content only" instructions, the effects of content were all significant; under "use tone only" instructions, the effects of tone were also all significant; and finally under "use all the information" instructions, the effects of tone were all significant, while there were no effects due to content. For Speaker B communications, under "use content only" instructions, the effects of content were all significant; under "use tone only" instructions, the effects of tone were somewhat weak and only eight of the nine comparisons of adjacent cell means yielded significant differences; and finally under "use all the information" instructions, the effects of tone were again somewhat weak and only eight of the nine comparisons of cell means yielded significant differences, while there were no effects due to content. Finally, under "use all the information" instructions, analysis of responses to Speaker A communications did not yield a significant Tone  $\times$  Content effect, while analysis of responses to Speaker B communications did yield a significant Tone  $\times$  Content effect.

## DISCUSSION

A discussion of the combined effects of tone and content on inferred attitude is meaningful when the independent effects of tone and content are ascertained. As already noted, the methodology of the above experiment was designed to allow the identical stimulus materials for obtaining the independent effects of content, the independent effects of tone, and the combined effects of tone and content on inferred attitudes. The findings regarding the independent effects of content were unambiguous. When subjects were asked to attend to the content portion of a spoken verbal communication, which also included systematic variations in its tonal component, they responded primarily to the content portion. The discriminations between varying degrees of positive-negative attitude communication in content indicate that the independent effects of content were clearly operative. Furthermore, the judgments of attitude obtained under "use content only" instructions corroborated the judgments of attitude which were obtained when other subjects were presented with only the written contents.

The findings regarding the independent effects of tone were somewhat complicated by the fact that when subjects were asked to attend to the tonal portion of a spoken verbal communication, which also included systematic variations in its content component, they were somewhat influenced by variations in content. However, as has already been noted, these effects due to content were weak and inconsistent. Thus, under "use tone only" instructions, subjects' responses indicated a stronger and more consistent set of effects due to tone than due to content. Furthermore, the discriminations of varying degrees of positive-negative attitude communication in tone indicated that the independent effects of tone were clearly operative for Speaker A communications and for most of Speaker B communications (eight out of nine assumed differences).

The findings also indicated that the independent effects of tone, overall, were stronger than the independent effects of content. Thus, if tone and content were to have contributed to inferred attitudes in proportion to their independent effects, analysis of the data obtained from the subjects who were instructed to use all the information available would have yielded main effects due to both tone and content, with a stronger main effect due to tone. The actual findings did not support an assumption of proportionate contribution of tone and content to inferred attitude. The responses of subjects who were instructed to use all the information available indicated no main effects of content. The

variability of response to tone and content combined was primarily determined by variations in tone. In the case of Speaker B communications only, there was, in addition to the main tone effect, a Tone  $\times$  Content interaction effect. The latter effect seems to be due to the pronounced effect of negative tone in the positive-content condition.

While the above findings provided support for the hypothesis, the methodology which was used for assessing the independent effects of tone failed to solve the problem for which it was intended. It will be recalled that the methodology was designed to make possible the use of identical spoken materials for assessing the independent effects of tone, the independent effects of content, and the combined effects of tone and content. An alternate methodology could have employed written communication for assessing the independent effects of content and electronically filtered speech (with the content rendered incomprehensible) for assessing the independent effects of tone. The latter method, as well as the one used, introduces some ambiguity in the assessment of the independent effects of tone. A comparison is needed for the independent effects due to tone of a given set of spoken communications obtained with "use tone only" instructions and with the filtering technique. If the two methods yield equivalent results, they can be used in combination in an attempt to replicate the findings of the above experiment.

Having commented on some methodological problems, it is possible to proceed to a discussion of the implications of the findings. The results indicate that judgments of attitude from "inconsistent" messages involving single words spoken with intonation are primarily based on the attitude carried in the tonal component. In other words, the tonal component makes a disproportionately greater contribution to the interpretation of the total message than does the content component. These findings regarding the relative contribution of the tonal component of a verbal message can be safely extended only to communication situations in which no additional information about the communicator-addressee relationship is available (as was the case in the above experiment). For example, it seems that communications accompanied by the communicator's commitment to action will be judged according to that action. "I hate you," said in a positive tone of voice, may be interpreted as a positive-attitude communication in the absence of additional information. However, if the communicator says, "I hate you," in a positive tone while striking his addressee, the attitude communicated is a negative one. In such

instances, the positive tone indicates the communicator's pleasure at what he is doing. Information about commitments of a communicator can also be given in the verbal portion of a communication. For example, a boss can tell his assistant that he is fired in a pleasant tone of voice. Here again, the tone of voice indicates the boss' pleasure about his communication, rather than a positive attitude towards the assistant.

While the above experiment dealt with the relationship between tone and content in attitude communication, it is possible that similar relationships exist between other implicit communications of attitude (e.g., facial expression) and content. In other words, when an implicit communication of attitude is inconsistent with an explicit content communication of attitude, the contribution of the implicit component may be disproportionately greater than its independent effect. For example, smiling at the addressee while insulting him verbally generally communicates an affectionate rather than an angry attitude, in the absence of other communicator commitments to action consistent with the content portion.

Finally, the above study has some implications for the "double-bind" theory of schizophrenia. It has been hypothesized that high incidence of inconsistent communications in the families of schizophrenics compared to families of normals contributes to the generation and maintenance of the maladaptive patterns of interpersonal functioning observed in schizophrenics (e.g., Bateson, Jackson, Haley, & Weakland, 1956; Haley, 1963; Weakland, 1960). The assumptions involved in such theorizing seem to be that: (a) Inconsistent components in a message are decoded separately; (b) a consensual or adaptive response to all components would lead to incompatible responses—double bind; (c) the addressee or target of frequent inconsistent double-bind messages learns to respond with his own inconsistent messages—namely, his maladaptive responses. Assumptions *a* and *b* imply that the inconsistency between two components in a communication remains unresolved for the addressee and that there is little subordination (or superordination) of the inconsistent components with respect to each other. The present study of decoding of inconsistent communications by normals does not support these two assumptions. It is of interest to determine whether persons classified as schizophrenics, when faced with inconsistent communications, would judge the overall communications in the same ways as the subjects in the above experimental sample. If so, the higher incidence of inconsistent communication in fami-

lies of schizophrenics than in families of normals could reflect a higher incidence of negative-attitude communications, provided it can be assumed that the implicit components of the reported inconsistent communications typically communicate a negative attitude. The preceding assumption is supported by the anecdotal data reported by investigators of double-bind-related phenomena (e.g., Weakland, 1960). Given the proposed interpretation of inconsistent communications, it could be argued that unusually frequent negative-attitude communicating messages do contribute to severe psychopathological functioning, but for reasons other than those given in double-bind-type conceptualization. For example, indiscriminate negative reinforcement is not conducive to learning the numerous interpersonal and social skills which are lacking in individuals classed as schizophrenics. In short, it is suggested that the relative status of various components of a message needs to be explored so that response to the total message can be specified on the basis of response to its components. With such information available, the contribution of an unusually high frequency of inconsistent messages to psychopathological functioning may be elaborated in terms of generally established theoretical concepts.

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