Effects of Source, Message, Audience Characteristics on Health Behavior Compliance

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EDUCATION for health can be thought of as a learning process that may involve cognitive, affective, and behavioral components which influence what a person knows, believes, or does about health matters. This learning process is one by which individual knowledge, attitudes, motivations, and behaviors are changed.

The educator is one who attempts to facilitate the learning process in a direction deemed appropriate and desirable. Planned intervention is aimed at influencing and persuading an audience, ranging from one person to a large group of people, to (*a*) practice acceptable health behavior, such as brushing one's teeth regularly or submitting to a medical examination; or (*b*) refrain from some undesirable behavior, such as smoking cigarettes or using the services of nonscientific practitioners.

I will discuss some elements of the learning process, specifically focusing on certain communications characteristics. I also will review the results of a field experiment and their applicability to questions about the use of health aides as communicators in educational programs.

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Communications comprise the fundamental element in the influence-learning process. The most effective communication and persuasion methods for various target groups in different settings have been widely debated, and much discussion has resulted about the relative effectiveness of face-to-face communications as compared with communicating through the mass media. I do not want to argue these issues but rather to look more closely at several key variables in the communications process as they relate to influencing health behavior.

Communications Characteristics

The following characteristics, or variables, in the communications process have been identified and studied to some degree: source, message, and audience.

Source characteristics. Several classic studies have shown the differential effects of various sources of communications. Hovland and coworkers (*1*) have reported evidence that is based on a series of studies which show that a communicator with high credibility, composed mainly of expertness and trust factors, elicits more change of opinion in the desired direction than a communicator with low credibility using an identical message.

Aronson and associates (*2*) reported similar results, showing that by increasing the discrepancy

between the attitude of the highly credible source and that of his audience the communicator can increase the amount of change in attitude. In related studies Mills and Aronson (*3*) determined that a more attractive communicator elicited more change of opinion than a less attractive communicator. These few of many research studies indicate the importance of the source of a communication in influencing reactions to messages, both verbal and written.

Message characteristics. Much research on message characteristics has been conducted by commercial enterprises, and the results are being used by advertising specialists. Little of this kind of research reaches the public because of the competitive nature of private industry.

Illustrative of the reported research on differential effects of messages is that concerned with the effects of fear arousal on influencing behavior. Janis and Feshbach (*4*), in one of the first fear-arousal studies, found that a threatening message elicited less compliance with the recommended behavior than a message using minimal fear-arousing statements. Janis and Terwillinger (*5*) later explained these results by concluding that "high fear" communications develop psychological resistance in the recipient. Hovland and co-workers (*1*) suggested that a "defensive avoidance" mechanism is activated as a response to highly threatening messages.

Other fear-arousal studies have yielded conflicting findings: Haefner (*6*) was not able to replicate the Janis-Feshbach results (*4*) and, as a result of further analysis, showed different responses to fear communications according to the socioeconomic status of the recipients. Fear-producing messages generated the desired effects among lower socioeconomic status groups, and more reassuring messages had better results among higher socioeconomic status groups.

Swinehart (*7*) varied the headlines on a series of health articles, with some headlines being threatening and others being reassuring; otherwise the content of the articles was identical. Senior citizens participating in this study chose to read the threatening headlines more often than the reassuring ones—opposite to Swinehart's predictions of defensive-avoidance reactions. He found worry and interest to be linearly related.

Audience characteristics. A number of factors related to the recipient of a message have been shown to be important in determining audience response and extent of compliance. Haefner's finding about socioeconomic status level differences in reactions to fear-arousal messages is only one example (*6*). Levine (*8*) found that people with higher educational attainment tended to be less fearful than the less educated in response to messages. Hovland and associates (*9*) found that the educational level of communications recipients was a factor in responses to one-sided and two-sided arguments. In general, communications presenting two sides of an argument were more effective among the better educated group, and one-sided presentations were more effective among the lesser educated audience.

Robbins (*10*) investigated the effects of several personality characteristics and concluded that persons classified as having a high level of anxiety are interference prone and are likely to activate defensive mechanisms which result in their denying threatening stimuli. These people are less likely to learn the content of fear-arousing messages than those with low anxiety.

Audience characteristics enter into the communications process in another important way. Outside a laboratory or contrived setting, it is difficult to change opinions because one cannot force a person to accept a message, and particularly a discrepant one. To be influenced by a communication, an audience obviously must be exposed to a message, must perceive the message correctly, must retain the content or recommendation, and must decide to comply. Yet we know that people expose themselves selectively to messages, perceive selectively, retain or forget selectively, and decide selectively. These notions, with supporting documentation, are discussed by Cox (*11*).

Applicability of study results to health education practice. Studies like those cited yield valuable clues for educators, but several deficiencies become apparent as one tries to translate the results into practice. First, most of these studies have been conducted in an experimental laboratory setting, usually with college students. The topics typically involved unreal issues; the subject matter on which their attitudes and opinions were asked were of questionable relevance and the outcomes of little consequence to the experimental subjects. In the laboratory, experimenters have a captive audience, unlike self-exposure to communication in real-life situations.

In a typical experiment, one variable at a time normally is manipulated while holding all other variables constant. The results therefore yield minimal information concerning the relative im-

portance of several variables interacting in combination, which consistently occurs in community settings.

Most of the studies have measured an attitude or opinion, rather than behavior, as the dependent variable. Questions are being increasingly raised about the relationship between a person's attitude and his behavior. Whether attitudes precede behavior or behavior determines subsequent attitudes has been questioned in Festinger's study of cognitive dissonance (*12*).

Indigenous Aides as Communicators

Increasingly, persons indigenous to specific target populations are being used as aides in many health programs. Several demonstration projects have been reported showing that aides can be recruited, trained, and used in various programs. Advocates of using aides in health education programs have pointed out advantages, contending that similarity of background and experience allows the aide to relate better to members of the target population, that he can perceive problems of that group better than an outside professional, and consequently he will be better able to influence his peers to comply with the recommended behaviors.

Certain problems appear to be implicit in the approach of using aides as influence agents in health programs. Implicit is the assumption that characteristics of the communicator are the pervading qualities in an influence situation. Similarity of some important characteristic, shared between the communicator and his audience, is assumed to be a critical factor in this communication and persuasion process. Most studies concerning similarity between communicator and audience generally lead one to hypothesize that as similarity increases between a communicator and an audience in some shared characteristic, increased compliance results on the part of the communication recipient (*13–17*).

At least two important studies have yielded results that conflict with these assumptions. In a neighborhood center, Grosser (*18*) found that local residents were better able than professionals to perceive local problems and were better able to predict the attitudes and perceptions of residents; however, the local residents were relatively ineffective in changing attitudes or behavior in the community. A study of communication methods by Roberts and associates (*19*) among Navajo women produced results that are difficult to interpret. They found that a tape-recorded message was more effective in persuading newly delivered Navajo mothers to return to the hospital for post partum care than an identical message presented in person by the Navajo aide who had recorded the message. This result was unexpected and unexplained. Possibly the use of the tape recorder lent an air of importance to the message that was absent when the message was delivered in person.

Assumptions that aides indigenous to a particular neighborhood or population group are better able than outside professionals to influence their peers appear to be based on the general hypothesis that similarity on some important shared characteristic should facilitate attitude, opinion, and behavioral change. The use of indigenous persuaders seems to be based on a theory of automatic identification with objectively similar people.

The basic research question is whether influence is facilitated by similarity. Underlying this question are several others concerning what dimensions, or personal characteristics, are used by people to judge others as similar or dissimilar to themselves; which of these dimensions are relevant in a health and medical setting; and what effect similarity has on attitudes, beliefs, and behavior.

Some attributes of similarity used as criteria for selecting indigenous aides in several reported projects include race, geographic area of residence, age, and certain ethnic or cultural characteristics. If race, neighborhood, background, and other socioeconomic characteristics are not relevant to health action, however, then perhaps the indigenous aide, as such, is not the answer to influencing effective attitudes or behavior.

Study Design

To test hypotheses concerning the relative importance of several communications characteristics on beliefs and behaviors, a field experiment was conducted in 1968 with maternity patients at Wayne County Hospital in Michigan. The research, summarized here, is reported in detail in another publication (*20*). Basically, a four-way analysis of variance design was used in which communication source, message, and audience characteristics were tested as independent variables in an institutional setting. Data were collected about certain beliefs and behaviors as dependent variables.

Source characteristics were represented in two

ways. Race and professional status characteristics were studied by presenting systematically varied identical messages, using as communicators black nurses and white nurses and black housewives and white housewives, all having children. Two types of messages also were used, each recommending specific behaviors for the mother to accept for herself and her baby. In one condition the message was given without any mention of similarity between the recipient of the communication and the communicator. The alternate message referred specifically to similarity of motherhood experience between communicator and mother; otherwise, the message was identical. Communicators and messages were systematically alternated among the women who were message recipients, making up the 16 different combinations analyzed in this study.

Sixty-two of the 122 women in the experiment were black, and the remaining 60 were white. Thus the investigators could collect data on compliance, based on race of the mothers; on age, certain attitudes, beliefs, perceptions, and experiences; on whether they were having a first child; and on other related factors.

In addition to knowledge and beliefs about recommended behaviors, data were collected over a 2-month period concerning whether the mothers, after going home, actually complied as recommended. They were given two cards to fill out in the hospital: one card was to ask for information on family planning and the other was to receive a booklet on maternal and child care, both of which had been recommended in the initial message. These requests constituted immediate behaviors that the women could accomplish during their stay in the hospital.

Data were also collected on whether they brought their child in for a well-baby visit, whether they submitted to a post partum examination, and whether they participated in the family planning clinic, as recommended by the message. These actions constituted delayed behaviors. Both immediate and delayed behaviors were used as dependent variables in the study, as were certain measures of reported intent to comply and the perceived importance of these preventive actions.

Results

Source characteristics. Researchers have hypothesized that as similarity between the communicator and the recipient of the communication increases, behavioral influence should likewise increase. Data were collected about two basic types of similarity: that perceived by the recipient of the communication, as measured by an index of similarity attributes, and an objectively defined similarity based on overt characteristics such as race (black or white) and professional status (nurse or housewife).

In this study, the women were interviewed both before and after the message was presented to determine how similar the communicators were perceived to be and changes that occurred in time. Although racial similarity was an important attribute in a person's identification of interpersonal similarity, as shown by both premeasurements and post measurements, the effect of this variable on actual beliefs or behaviors was not clear in this study. Perception of racial similarity could be modified somewhat by merely suggesting similarity in the message, but there was no strong racial effect on beliefs or behaviors, as shown by the lack of statistical main effects in the analysis of variance. Instead, racial perceptions interacted with a number of other independent variables, and especially with message characteristics.

The status of the communicator, however, produced a main effect for immediate behaviors that could be accomplished during the hospital stay. Even though the women perceived the nurse communicator to be more expert and more appropriate to be presenting this kind of information to them, their actual behavior was influenced more by the housewife communicator than by the nurse, regardless of communicator's or subject's race (table 1). This effect is more dramatic if one considers the two immediate behaviors in terms of the number of women who complied (table 2).

(The 0.05 level of statistical significance was used as the basis for interpreting the data in all

Table 1. Effects of communicator status on behavior of the women, one-way means

Behavior	Communicator		*F* ratio
	Nurse	Housewife	
Immediate (postcards)[1]	0.53	0.94	8.07
Child oriented[2]	.87	1.18	5.50
Overall index (combined)	2.19	2.89	5.19

[1] Behavior that could be accomplished during hospital stay.

[2] Behavior taken by mother specifically for infant's welfare as opposed to her own; for example, bringing the child to the clinic for a well-child examination as compared with returning for a post partum checkup.

Table 2. Effects of communicator status on immediate behavior of the women

Immediate behavior	Communicator		Total
	Nurse	Housewife	
Total	57	65	122
Filled out a postcard	22	47	69
Did not fill out a postcard	35	18	53

NOTE: chi-square = 14.75.

Table 3. Effects of similarity suggestion, race of communicator, and race of subject on reported beliefs of the women concerning importance of post partum examination, mean scores

Race of subject	Communicator	
	White	Nonwhite
Similarity suggested, experimental:		
White	4.43	5.69
Nonwhite	5.83	5.68
Similarity not suggested, control:		
White	5.19	5.54
Nonwhite	5.10	5.90

NOTE: F race × race × message = 4.80.

tables, and all reported results exceeded this level unless otherwise stated in the text. The critical F ratio with 100 degrees of freedom is 3.94. Because the N is 122 and there are 16 cells in the analysis of variance, the degrees of freedom are normally 106. With occasional missing data, the degrees of freedom decrease to about 100.)

Although the nonprofessional communicator obtained more compliance in immediate behaviors, no difference of effects in long-range behavior was observed between housewife and nurse communicators.

Message characteristics. By suggesting similarity in one experimental manipulation, the investigators could increase perceptions of similarity toward the communicator for a number of personal characteristics (race, age, experience with babies, and so forth). Although the strength of perceiving similarity between the communicator and the recipient did not have a statistical main effect in itself, the suggestion of similarity interacted with a number of other variables to yield interesting results.

Interaction of race with suggestion of similarity produced different effects (table 3). White communicators were relatively more effective with nonwhite women if similarity was suggested. In the absence of such suggestion, nonwhite communicators were relatively more effective with women of both races.

Suggestion of similarity interacted with the status of the communicator (nurse or housewife) in beliefs about examinations for babies. If similarity was suggested, nurses were more effective than housewives in persuading the women of the importance of examinations of newborn infants. Housewives were more effective than nurses if similarity was not suggested.

In general, the suggestion of similarity between communicator and audience interacted with both communicator and audience characteristics. This experimental manipulation was successful in changing perceptions toward the communicator and in getting recipients of the communication to comply with messages from the communicators of another race or professional status; that is, increase compliance with the nurses' recommendations. This manipulation of the message in and of itself was not sufficient to cause differential behaviors without the interactive effects of communicator and audience characteristics.

Audience characteristics. One of the most significant results of the study was that parity of the women (primiparas and multiparas) became an important factor in determining whether or not the recipients of communication actually behaved as recommended. Long-term compliance (delayed behavior after hospital release) was greater for primiparas exposed to the suggestion of similarity than for those to whom similarity was not suggested (table 4).

Although this phenomenon occurred for primiparas with delayed behaviors, considering all delayed, or clinic, behaviors, there were no differences between compliance of primiparas and multiparas in the immediate behaviors that they could have taken in the hospital (table 5). The immediate behaviors consisted of women completing sep-

Table 4. Interaction of similarity suggestion message and parity of subject on delayed, or clinic, behaviors of the women, mean scores

Treament message	Primiparas	Multiparas
Similarity suggested, experimental	3.16	3.47
Similarity not suggested, control	2.73	3.16

NOTE: F interaction = 5.12.

arate postal cards to obtain a booklet on child care and to seek family planning advice while hospitalized. Delayed behaviors included actions taken to bring the baby to a well child clinic 4 weeks after birth, the mother's attendance at a post partum clinic 6 weeks after delivery, and participation in the family planning program.

These data lead one to believe that suggestion of similarity in the message had an effect on the primiparas beyond the immediate situation and social setting in which the communication took place. Multiparas generally indicated greater intent to comply with the recommendations in a message and indicated the suggested behaviors to be more important than did the primiparas. Actual behavioral response was quite different, however, with primiparas showing greater compliance in the long run.

These results suggest that multiparas, having experienced previous hospitalization and child care, knew the answers expected of them. They were less vulnerable to suggestion, however, than the primiparas. Multiparas were more likely to have established models for behavior outside the hospital on whom to rely for behavioral cues; hence they did not depend on the advice given by the hospital communicator to the extent that the primiparas eventually did.

The primiparas were less experienced and less likely to have previously instated behavioral models; in addition, they were less likely to know the behaviors expected by the professionals. When out of the hospital and faced with cues about mother and child care, the hospital model (that is, the hospital communicator) was evoked, which led to greater identification and compliance. These results were true for both white and nonwhite communicators and for those who received the message from nurse or housewife, showing that in this instance the communication source was not necessarily a significant factor. Message characteristics, however, played an interactive role; the suggestion of similarity interacted with the subject's prior experience to produce a behavioral effect.

Group differences. Apparent differences existed among groups in viewing the appropriate way of delivering a health message and in perceiving the expertness of nurses and housewives about health matters. Initially, the white women judged the housewife to be more experienced than the nurse communicator in maternal and child health. The nonwhite women judged the nurse to be more experienced. After the message was presented, these differences disappeared, as indicated in the results of premeasurement and post measurement interviews of the women.

Table 5. Interactions of parity, communicator status, and message on immediate behaviors of the women, mean scores

Communicator status	Primiparas	Multiparas
Similarity suggested, experimental:		
Nurse	1.4	1.5
Housewife	1.7	2.0
Similarity not suggested, control:		
Nurse	1.7	1.6
Housewife	1.9	2.1

NOTE: F parity × status × message = not significant.

In premeasurement, all women in the study viewed the nurse communicator as more expert, more appropriate to present the information, more trusted, and more desirable as a visiting friend as compared with the housewife communicator. In post measurement, however, trust in the housewife communicator's expertness increased sufficiently to eliminate the original main effect of trust in the nurse's expertness, as reported by the women. Although these findings are largely unexplained and deserve further study, we might conclude that differences in group perceptions and reactions, along with the observation of interactions among factors of race, professional status, and type of message presented, are important factors to consider in the communication and persuasion process.

Beliefs and behaviors. A positive relationship between attitudes, beliefs, and behaviors was hypothesized and rejected, based on the study results. Although there were strong intercorrelations among beliefs held by the women, measured by reported importance of the action and intent to act, no significant correlations existed between stated beliefs and the behaviors exhibited by those persons holding these beliefs. Reported importance was positively correlated with intent to comply with the recommended behaviors ($r = .51$); however, neither intention nor importance was in any way related to the behaviors.

Conclusions

The study results cast doubts concerning the superior effectiveness of indigenous communicators (aides) in eliciting compliance with recommended health behaviors. Although the results were not simple and clear cut, as evidenced by

many interactions among the variables, the following general observations concerning this study might be made:

1. Although racial similarity was a pervasive influence in perceiving interpersonal similarity, race had no observable influence on subsequent behaviors.

2. Strength of similarity perceived by the women toward the communicators in and of itself had no effect on subsequent beliefs and behaviors.

3. By suggesting similarity between communicator and audience, racial perceptions of similarity were modified, with white and nonwhite women viewing each other as somewhat more similar.

4. The housewife communicator was more effective than the nurse in obtaining compliance for immediate inhospital behaviors, regardless of race of communicator or patient. This result did not hold for long-term behaviors, in which no differences occurred between the groups.

5. Experience appeared to be an important factor in the persuasion process. Primiparas, with no previous experience in mother and child care, were more likely to accept influence attempts than multiparas, who already had experience and instated models for health cues. Communicators who suggested similarity to primiparas were more successful in linking with the patient's outside world and in gaining long-term acceptance and compliance in behaviors.

6. No relation was found between stated beliefs and actual behaviors.

Much further study is needed to clarify these concepts and results. Caution should be used in generalizing the results because this research was conducted in a large urban hospital with its maternity patients as subjects. The results might not hold for another setting, another topic, or a different population group. The results are instructive, however, and point out the necessity of using caution to avoid oversimplifying the communications, concepts, and strategies.

The practical question is not whether to use aides in health programs but how to use them most effectively. Aides are used in educational programs for a variety of reasons, usually for increased communications with consumer groups, for the economy of hiring lesser trained personnel, for the political factors of involving local people in health programs affecting them, for provision of employment opportunities, and so on.

Field experiences indicate that, despite some difficulties, indigenous aides can be used in a variety of health programs. It is naive to believe that a person who is a member of a population group can always influence his peers to act in some specific manner or is necessarily superior to an outsider, such as a professional worker, in ability to influence.

When considering the use of indigenous aides as educators, it would be well to remember that we are primarily focusing on only one communication characteristic: source. Message and audience characteristics are perhaps even more important in getting desired results in the long run. Background and experience of the audience are especially important in the reactions to messages. Although almost trite, the adage of "know your population group" assumes great importance in that this study showed differential reactions to communicators, according to the population group of the audience.

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At the Wayne County Hospital in Michigan, 122 maternity patients were used as subjects to test several hypotheses about variables related to source, message, and audience characteristics and their effects on health beliefs and behaviors. This experiment in communications and persuasion was conducted in a field setting, using a real life situation in which the subjects were not aware of the study aspects of the activity.

Variables that were systematically used in the study included perceived communicator-audience similarity, especially race, and professional status of communicator. Certain message characteristics, such as degree of similarity suggested, were used as were selected audience characteristics like parity and race of patient.

Message, communicator, and audience variables interacted in a variety of ways, many of which were complex and not well understood. Racial similarity did not produce the predicted effect. Housewife communicators were more effective in eliciting compliance with the short-term recommended behaviors in the hospital than were nurse communicators but were not more effective for longer range out-of-hospital clinic behaviors.

A key factor in long-term compliance was the parity of the subject. Primiparas complied in long-range actions, such as returning for a post partum examination, accepting planned parent services, and bringing the baby back for a checkup, if similarity had been suggested by the communicator when the message was given. This occurred regardless of the race of communicator or subject or professional status of the communicator.

Multiparas, with prior experience in caring for children, responded more accurately to questions about desirable beliefs and intended behaviors regarding mother and child care; but did not respond as well as primiparas in actual behavioral compliance for the long-term clinic behaviors.

This study concluded that several key elements of the communications process interact in combination, not the least of which are characteristics of the audience receiving the message, that influence the receptivity to listen and act. No correlation was found between reported beliefs and actual behavioral compliance.