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## The Multiple Affective Outcomes of AIDS PSAs:

### *Fear Appeals Do More Than Scare People*<sup>1</sup>

*The widespread use of fear appeals in health communication campaigns seems to reflect the existence of a folk theory that predicts message acceptance as a function of induced fright. Whereas there is empirical evidence consistent with that position, recent research also shows that other affects may influence message acceptance as well. Two studies were conducted to determine the extent to which a sample of public service announcements (PSAs) on the topic of AIDS/HIV evoked affective responses, the degree to which those affects predicted message acceptance, and the mechanism by which feelings, including fear, operate on message acceptance. Results showed that a variety of affects were induced by the PSAs, most of which did predict message acceptance. However, considerable variation was observed in both sign and magnitude of the associations. As for mechanism, the data suggested that the effects of affect on message acceptance were mediated by heuristic rather than systematic message processing.*

Fear appeals emphasize the noxious consequences that will befall message recipients if they fail to adopt the recommendations of the source. Such messages are quite common in public health campaigns, presumably because health campaigns must often present information on issues with severe consequences for audiences (Soames Job, 1988).

A recent study by Freimuth, Hammond, Edgar, and Monahan (1990) provides systematic evidence of the widespread use of fear appeals. In their content analysis of AIDS public service announcements (PSAs), 18% of the

PSAs directed toward general audiences were classified as this type of appeal. An even larger number of the PSAs directed toward specific audiences, such as intravenous drug users, fell into the same category (39%).

Such widespread use of fear appeals suggests the existence of an implicit theory-in-use that posits that persuasion will follow from a state of fright.<sup>2</sup> In fact, there is empirical evidence that is perfectly compatible with such a theory. Three meta-analyses of the fear appeal literature converge in their conclusions that the experience of fear is positively and linearly associated with persuasion (Boster & Mongeau, 1984; Mongeau, 1990; Sutton, 1982). Although theoretical questions concerning the relationship between fear and attitude change are not yet resolved, there is no denying the empirical association between the state of fear and persuasion (see Witte, 1992, for a current theoretical exposition).

This implicit theory is complicated by the observation that fear is not the only affect that may influence attitude change. Research conducted by Abelson, Kinder, Peters, and Fiske (1982) is a case in point. In a study of political figures, they report independent effects for positive and negative feelings on attitudes toward candidates. Earlier studies also show that fear appeals may arouse feelings other than fear and that certain of those emotions, such as anger, may inhibit rather than enhance persuasion (Dabbs & Leventhal, 1966; Leventhal & Singer, 1966; Leventhal, Singer, & Jones, 1965).

Together, these issues suggest a set of questions with strong implications for the use of fear appeals in PSAs. Do fear appeals, as they occur in public health messages, actually induce a state of fright? And, do these fear appeals induce feelings other than fear? These questions are of an applied nature, but the manner in which they are answered will determine whether or not it is possible to ask two additional questions of a more theoretical nature. Specifically, how do multiple affective responses influence acceptance of the message, if at all? And, by what mechanism(s) do affects exert their influence on message acceptance, if at all?

These are the questions that motivated the present study. To address them properly, it was necessary to consider the functions of affect, the degree to which various affective states co-occur, and the mechanisms by which affect might shape the persuasive process. We turn to those issues now.

### *The Functions of Affect*

Changes in the environment may have a variety of implications for an individual's well-being. Emotions are specialized states of being that aid an

organism in coping with those changes (Frijda, 1986; Roseman, Spindel, & Jose, 1990; Scherer, 1984; Smith & Lazarus, 1990). They do so by activating a complex but unified set of changes that involve cognitive, perceptual, expressive, motivational, and physiological systems. Fear, for example, is accompanied by increased heart rate, sweating on the palms and feet, decreased blood flow to the extremities, a narrowing of cognitive focus, and heightened attention (Ax, 1953; Ekman, Levenson, & Friesen, 1983; Levenson, Ekman, & Friesen, 1990). These changes are adaptive in that they prepare the individual to respond to a threatening stimulus either by fight or by flight. In the most general sense, emotions function to enhance the likelihood of survival of individual organisms and, by extension, the species. The advantage of emotions over careful cognitive analysis is the rapidity and globality of response. In fact, one function of emotion is to alert the cognitive system to the state of the organism-environment relationship.

Environmental changes that are relevant to the well-being of an organism can take many forms. The appearance of a threatening stimulus may induce either fear and a corresponding tendency to withdraw or anger and a corresponding propensity to attack. The emotional outcome will likely be determined by the power of the individual relative to the stimulus.

Because threats to the organism come in a variety of forms, a parallel variety of emotional responses is required. Plutchik (1980) provides one of the most precise analyses of particular affects and their functions. He contends that fear operates to protect the organism, joy-ecstasy provides the emotional basis for reproduction, and disgust-loathing functions to reject potentially harmful portions of the environment. It is not necessary to accept his specific claims to take his broader point: Emotions move the organism into states of being that are preparatory to particular forms of person-environment interaction.

### *The Co-occurrence of Affects*

Plutchik (1980) claims that "emotions are rarely if ever experienced in a pure state" (p. 103; see also Izard, 1977, p. 103). Consistent with his claim, some studies of emotion show that when fear is induced by an environmental change such as an upcoming examination, it is often accompanied by anger (Schwartz & Weinberger, 1980; Smith & Ellsworth, 1987; but see also Ellsworth & Smith, 1988). Investigations of emotional reactions to the 1991 Gulf War (Kinder, 1994) and to interpersonal conflict (Hardy & Smith, 1988; Smith, Sanders, & Alexander, 1990) also show a positive correlation between anger and fear. Especially germane to this article, a pattern of co-occurrence

between fear and anger has been observed in some studies of fear-arousing health messages (Dabbs & Leventhal, 1966; Leventhal & Singer, 1966; Leventhal et al., 1965). In short, evidence from diverse sources indicates that multiple affective responses to single events are common.

An explanation for the multiplicity of affective responses may reside in the simultaneous ambiguity and complexity of person-environment interactions. On the one hand, events are rarely so clear that multiple interpretations are impossible. Is the thin, brown object on the ground a poisonous snake or a fallen tree branch? Because identifying the correct interpretation has survival value, individuals should be motivated to consider more than one reading of an event. As the individual turns the event over in his or her mind, seeing things from a different perspective each time, multiple emotional outcomes may result.

On the other hand, most events are sufficiently complex that they have a multiplicity of implications for the individual. Typically, any given event will have both positive and negative implications for the individual. For instance, it is often thought that application of a condom, although offering some protection against HIV, also runs the risk of derailing the moment's passion. Moreover, events can imply an assortment of positive and negative outcomes. From a positive perspective, a sexual encounter might be viewed as a release of sexual tension, a period of intimacy, and a part of the development of a close relationship. Attention to each of the different implications should yield different emotions.

In health campaigns, messages are used to convey information to the public concerning environmental changes that have ramifications for their well-being (O'Keefe & Reid, 1990). One approach, widely used in the campaign against AIDS, has been to design messages that describe the negative consequences of various risky behaviors. Presumably, there is an expectation that creating fear in the message consumer will discourage the risky behavior. Whether or not such messages actually do engender a state of fright is open to question. There is the possibility that such messages, independent of their capacity to make message consumers afraid, may induce other, unintended affective responses.

### *Affect and the Dual-Process Models of Persuasion*

The question of whether health messages produce fear and/or other emotions would be of little practical interest if there were no relationship between affective response and message acceptance. However, a rapidly growing literature suggests that affective responses, in addition to fear, may influence

message acceptance (see Eagly & Chaiken, 1993, for a review). The bulk of this research has been conducted within the framework established by the dual-process models of persuasion, that is, the heuristic-systematic model (Chaiken, Liberman, & Eagly, 1989) and the elaboration likelihood model (Petty & Cacioppo, 1986). Although there are important differences between these two theories, they are also alike in many ways. For the purposes of this project, the similarities are more central than the differences. Both models assume that the mental responses made to a message are the proximal determinants of message acceptance.

Chaiken et al. (1989) propose the existence of two conceptually distinct modes of message processing. *Systematic processing* reflects careful, analytic, and effortful examination of the message. *Heuristic processing* occurs whenever an individual relies on some simple rule to construct an attitude toward the persuasive advocacy. For example, the notion that "experts are usually correct" might lead to agreement with a message presented by a source who was considered expert. One advantage of heuristic processing is that it consumes fewer cognitive resources than does systematic processing. Consequently, it may be the preferred mode of processing (a) when the issue is not important enough to merit careful thought or (b) when the message target is unable to process systematically (Chaiken et al., 1989; Petty & Cacioppo, 1986).

From the perspective of the dual-process models, affect might influence message processing in several ways. Two of those possibilities are of special interest here. One option is *biased systematic processing*; that is, affect may influence the valence of cognitions occurring in response to a message. Along these lines, Petty, Gleicher, and Baker (1991) expose good-mood and neutral-mood subjects to an involving persuasive message. Good-mood subjects reported a higher proportion of positive cognitions than did neutral-mood subjects. Agreement with the message was a direct function of the proportion of positive thoughts, a finding consistent with the dual-process models. Although not tested in the Petty et al. report, one might surmise that negative moods would produce a parallel effect in which negative affect would engender negatively valenced cognitions.

Another role that affect might play in the dual-process models is that of information. Following the lead of emotion theorists (e.g., Frijda, 1986), Schwarz and Clore (1988) suggest that affect may function as a heuristic. Feeling good is an indication that everything is all right and that, by implication, the message should be accepted. The presence of negative affect signals that something is amiss. Then, the message should be examined in greater detail so as to identify the nature of the problem.<sup>3</sup> This account of the effects of affect on persuasion depends on *heuristic processing* of the message.

Virtually all the dual-process research conceptualizes affect as simply positive or negative. Whereas many would argue that valence is a key feature of affect (but see Oatley, 1992), it seems equally apparent that there are important distinctions to be drawn *within* the two broad categories of positive and negative. This point is made forcefully by functional theories of emotion (e.g., Frijda, 1986; Oatley & Johnson-Laird, 1987), which contend that different feeling states serve different functions and move the organism into distinct states of operation. Next, we turn to a more detailed consideration of different affective states.

### *Features of Affects*

One of the controversies currently astir in the emotions literature is concerned with definitional boundaries. Russell (1980), with his interest in "feeling states," offers one of the most encompassing positions. That phrase—feeling states—is meant to include bodily states, such as alertness and fatigue, as well as more typical emotions, such as fear and anger. By contrast, Oatley (1992) embraces a more focused position that is limited to five "basic" emotions: happiness, sadness, fear, anger, and disgust. Pretesting led us to consider the six affects that are listed in Table 1. Even the narrowest of perspectives would insist on examination of happiness, fear, anger, and sadness. We included two more affects, surprise and puzzlement, about which there is less agreement. For example, Lazarus (1991) calls them "pre-emotions." In deference to the definitional controversy, we use the term *affect* to refer to the set of feelings under study in this project.

For present purposes, affects possess three related but conceptually discrete features: signal value, function, and action tendency. The *signal value* of an affect summarizes information about the state of the environment. Surprise is associated with a novel stimulus. Happiness reflects progress toward a goal. Anger follows from goal blockage. Based on the work of previous writers as well as our own thinking, Table 1 presents a summary of the signal values of six affects (Frijda, 1986; Oatley & Johnson-Laird, 1987; Plutchik, 1980).

Another way to look at affects is in terms of *function*. Given a particular configuration of stimuli, the affect shifts the organism into the state of operation that is optimal for dealing with that configuration. The purpose of puzzlement is to encourage efforts to understand. The function of fear is protection. Table 1 presents a functional analysis of six affects.

Finally, affects may be understood in terms of *action tendency*. These motivational tendencies are the means by which the functions are realized.

Table 1  
*Signal Values, Functions, and Action Tendencies Associated With Various Affects*

Affect	Signal Value	Function	Action Tendency
Surprise	Novelty	Orient	Focus
Puzzlement	Anomaly	Understanding	Analyze
Happiness	Goal achievement or progress	Conserve resources	Relax/continue toward goal
Fear	Danger	Protect/submit	Withdraw from stimulus
Anger	Obstacle	Remove obstacle	Attack
Sadness	Loss	Adjustment to loss	Withdraw into self/search for new plan

They propel the organism toward a particular behavioral response that complements the signal value. Consider surprise once again. When a novel and potentially significant stimulus appears in the environment, surprise is part of the response that urges the organism to focus on the stimulus. If, as the implications of the stimulus become evident, it is seen as a threat, then the organism will attempt to protect itself. The action tendencies associated with each of the affects appear in Table 1.

Although each of the action tendencies suggests a different response to a persuasive message, some responses are more apparent than others. Consider that, to the extent that fear is induced in a forced viewing situation, the message recipient is likely to submit psychologically to the advocacy. Consequently, fear should be positively correlated with message acceptance. The meta-analyses demonstrate that this is the case (Boster & Mongeau, 1984; Mongeau, 1990; Sutton, 1982). In line with the depiction of anger as the motivational basis for attack, it should produce the opposite effect, that is, disagreement with the advocacy. The few studies of fear appeals that also assessed anger show precisely this effect (Dabbs & Leventhal, 1966; Leventhal & Singer, 1966; Leventhal et al., 1965).

It is important to bear in mind that action tendencies are motivations for a type of behavior. They are not unalterable programs that beget a rigid sequence of behaviors. How an action tendency is instantiated behaviorally will depend on the setting in which it occurs.

## Study 1

Public health messages are often designed as fear appeals (Freimuth et al., 1990). Presumably, campaign designers embrace a theory of message effects that predicts compliance as a function of fright. However, it is not known whether existing fear appeals do, in fact, instill fear in their audiences. Thus we asked



Research Question 1: To what extent do AIDS PSAs classified as fear appeals actually induce fear?

Because of the ambiguity of social reality, most events and messages lend themselves to multiple interpretations. Further, due to the complexity of social reality, most events have multiple implications for the well-being of any individual. Thus both ambiguity and complexity are likely to engender differing patterns of cognitive appraisal that, in turn, generate multiple affective responses. These observations suggest that exposure to fear appeals may produce feelings in addition to fear. We posed two related questions.

Research Question 2: To what extent do AIDS PSAs classified as fear appeals induce affects other than fear?

Research Question 3: What is the pattern of co-occurrence among the affects?

If public health messages do in fact evoke different affects, then different action tendencies will be activated. Some tendencies, such as fear and anger, have fairly clear implications for message acceptance. Yet, for other affects, such as sadness, the effect of the corresponding action tendency is less apparent. These specifics aside, the most important issue is that each of the affects possesses a distinct action tendency. Consequently, to the extent that the various affects are present, we should expect that they will exert separate effects on message acceptance. We offered the following hypothesis.

Hypothesis 1: Each of the affects is uniquely related to the message acceptance.

## *Method*

### PARTICIPANTS AND PROCEDURES

A total of one hundred eighty-eight students enrolled in communication classes at a large eastern university participated in the first study. Initially, all participants filled out a series of scales designed to tap their current (i.e., baseline) affective states. Following that, subjects viewed a videotape composed of either five or six fear appeals regarding AIDS, provided information on their affective responses to each message, and made judgments of the persuasiveness of each message. The *Ns* per tape ranged from 29 to 37. Missing data on one or more PSAs reduced the available degrees of freedom.



## STIMULI

A total of thirty-one AIDS PSAs previously classified as fear appeals by Freimuth et al. (1990) served as stimuli. The PSAs varied in length from 10 sec to 1 min and advocated various different actions including seeking information, using a condom, avoiding multiple partners, avoiding intravenous drug use, and avoiding sex with intravenous drug users. Six separate stimulus tapes were constructed that consisted of five PSAs per tape except for one tape that contained six PSAs. An effort was made to assign PSAs to tapes such that a variety of advocacies were present on each tape. In addition, three versions of each tape were constructed that presented the PSAs in different orders.

## MEASUREMENT

Following the methods advocated by Hunter and Gerbing (1982), we conducted a confirmatory factor analysis on the full set of items that were intended to measure message acceptance and six different affects. Such an analysis calls for each item to pass three tests. The first, content homogeneity, requires that all items in a factor exhibit similarity of meaning. The second, internal consistency, requires that the pattern of correlations among the items (after reverse scoring where needed) is consistent with the pattern indicated by their factor loadings. Finally, external consistency requires that each item within a factor manifests a similar pattern of correlations with every other set of items (i.e., factors) external to the factor under scrutiny. The resulting unidimensional scales are described as follows.

To assess *message acceptance*, subjects rated each PSA on two 7-point semantic differential scales that were anchored with *not at all persuasive* to *very persuasive* and *not at all convincing* to *very convincing*. Six affect measures were constructed from multiple items. For each item, the response scale ran from 0 = *none of this feeling* to 6 = *a lot of this feeling*. The items that comprised each scale were *puzzlement* (puzzled, confused, bewildered), *surprise* (surprised, astonished, amazed), *fear* (fearful, afraid, scared), *anger* (angry, irritated, annoyed), *happiness* (happy, cheerful), and *sadness* (sad, dreary, dismal).

Subjects also responded to a single-item measure of their *frequency of exposure* to each PSA that they viewed. The scale asked them to circle the number between 0 and 10 that best represented the number of times that they had seen the PSA prior to the experiment. An option designated *more than 10* was also provided. On the possibility that more multiple exposures

to a message would diminish its affective impact, this measure was included as a control variable.

## Results

### MEASUREMENT ANALYSES

All of the scales were found to be unidimensional by Hunter and Gerbing's (1982) criteria. When coefficient  $\alpha$  was computed across PSAs for the *perceived persuasiveness* scale, the 2-item measure showed an alpha reliability of .96. Reliabilities for the affect scales were as follows: *puzzlement*, .74; *surprise*, .74; *fear*, .94; *anger*, .84; *happiness*, .93; and *sadness*, .78. Because frequency of exposure was a single item, its reliability could not be estimated.

### TRANSFORMATIONS

Prior to conducting any substantive analyses, an examination of the distributions was carried out for each of the variables. Because exposure and all of the affect variables showed substantial skewness, a square root transformation was applied. This was successful in reducing the average skewness from 2.5 to 1.5. The transformed variables were used in all subsequent analyses.

### PRELIMINARY ANALYSES

Whenever subjects are exposed to multiple stimuli, there is a risk that early trials may influence responses to later trials. To test for such effects, we presented each set of PSAs in three different sequences (ABCDE, EDCBA, and CDEAB). A series of repeated-measures analysis of variance was then conducted. These analyses treated each affect as a dependent variable within each tape for a total of 36 analyses (seven affects times six tapes). The between-subjects test for sequence effects was significant at  $p < .05$  in 8% of the tests (3/36). These instances were limited to tape 4 and involved *puzzlement*, *surprise*, and *fear*. Inspection of the means revealed a tendency for subjects to produce slightly stronger affective responses to PSAs that were earlier in the sequence. The finding has no theoretical significance for the questions under study, but it can be interpreted as a habituation effect. However, the 8% figure was sufficiently low that it also might plausibly be

attributed to chance. For reasons of parsimony, we gravitated toward the latter account.

Because the Mauchly sphericity test was significant in every analysis, we examined the multivariate tests of the within-subject effects (i.e., affect and the affect  $\times$  sequence interaction). Affect (i.e., whichever one of the affects was under test in a particular analysis) yielded a result that was significant at  $p < .05$  in 64% of the analyses (23/36). We interpreted this to mean that there was reliable variation in the affect-evoking capacity of the various PSAs.

The interaction term did not attain significance in any analysis. The absence of an interaction between affect and sequence indicated that explanations qualified by conditional references to the two independent variables were unnecessary.

In sum, there was very modest evidence for an order-of-presentation effect on affective responses to the PSAs. Because of its very low frequency and the absence of an interaction with affect, we were inclined to dismiss the effect as chance. The effect of PSA on affective response was stronger and more reliable, indicating that there were important differences in the affect-invoking capacities of the various messages. However, a finer grained analysis was needed to fully understand the data. For that, we turn to the analyses designed to address the three research questions.

### *Research Questions 1 and 2: Do Fear Appeals Induce Fear and Other Feelings?*

We conducted a series of paired sample  $t$  tests that contrasted the affect induced by each of the 31 fear-appeal PSAs with the feeling state prior to viewing any messages. The results showed that 61% (19/31) of the PSAs produced significant ( $p < .05$ ) increases in self-reported *fear*. The results for the remaining affects were as follows: *surprise*, 23% (7/31), decreased for 3 PSAs and increased for 4; *puzzlement*, 81% (25/31), decreased in every case; *anger*, 6% (2/31), decreased for 1 PSA and increased for the other; *happiness*, 100% (31/31), decreased in every case; *sadness*, 35% (11/31), increased for 8 PSAs and decreased for 3.

Also of interest is the issue of how many affects were evoked by each message. The data revealed that 3% of the PSAs (1/31) brought about a change in only one affect; 19% (6/31) evoked changes in two affects; 52% (16/31) evoked changes in three affects; 19% (6/31) evoked changes in four affects; and 6% (2/31) evoked changes in five affects. Overall, then, 97% of the messages produced change in two or more affects.

Table 2  
*Study 1: Correlations Among the Affects and Message Acceptance*

	Surprise	Puzzlement	Happiness	Fear	Anger	Sadness
Puzzlement	.42***					
Happiness	-.02	-.03				
Fear	.34***	.19**	-.12*			
Anger	.36***	.37***	.02	.19**		
Sadness	.32***	.21**	-.12*	.52***	.29***	
Acceptance	.24**	-.04	-.06	.50***	.00	.37***

Note. All coefficients are based on 970 observations except for those associated with acceptance, which are based on 921. However, significance levels were assessed using the number of subjects minus 2 (i.e., 186).

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

In sum, the results showed that most, but not all, of the fear appeals did in fact induce fear. The PSAs also evoked consistent decreases in puzzlement and happiness. Message effects on surprise, anger, and sadness were present but variable. Virtually all of the PSAs produced changes in more than one affect.

### *Research Question 3: What Is the Pattern of Co-occurrence Among the Affects?*

A matrix of bivariate correlations was constructed to answer the question regarding the pattern of co-occurrence among the affects. The results appear in Table 2 along with the correlations between the affects and the measure of message acceptance. At a glance, it is apparent that there is considerable covariation among the affects. Also worthy of note is the fact that happiness is independent of surprise, puzzlement, and anger and is only slightly related negatively to fear and sadness.

### *Hypothesis 1: How Do the Affects Relate to Message Acceptance?*

To examine the associations between the affects and message acceptance, a regression analysis was conducted that treated judgments of persuasiveness as the criterion variable and each of the affects as a predictor. Order of presentation, treated as a pair of dummy variables, and self-reported frequency of exposure to each PSA were included as control variables.

To carry out the repeated-measures analysis using regression,  $N - 1$  dummy codes were created to represent within-subject variance. These codes were entered first, as a block, and produced the following results:  $R^2$  change

Table 3  
*Study 1: Predicting Judgments of Persuasiveness*

Predictors and summary statistics	R <sup>2</sup> change	β
Block 1: Subject dummy codes <i>F</i> (178, 742) = 2.69**	.392	
Block 2: Control variables <i>F</i> (3, 739) = 3.75*	.002	
Order of presentation		
Dummy variable 1 vs. 2 and 3		.29
Dummy variable 2 vs. 1 and 3		.39
Frequency of exposure		.06*
Block 3: Affects <i>F</i> (6, 733) = 80.50**	.237	
Surprise		.21**
Puzzlement		-.19**
Happiness		.00
Fear		.58**
Anger		-.13**
Sadness		.15**

Note. The effects that correspond to the dummy codes for each subject are not shown.

\* $p < .05$ ; \*\* $p < .01$ .

= .392,  $F(178, 742) = 2.69$ ,  $p < .01$ . The significant  $F$  value for the block is an indication that many of the dummy variables were strong predictors of judgments of persuasiveness. The significance of any given subject dummy would indicate the presence of a response pattern that could be predicted by knowledge of that individual (vs. all other subjects in the data set).

Results of the analysis appear in Table 3. Order of presentation and frequency of exposure were entered in the next block. They produced the following results: change in  $R^2 = .002$ ,  $F(3, 739) = 3.75$ ,  $p < .05$ . Neither of the dummy variables used to represent order of presentation was significant; the  $\beta$  weights were .29 and .39 for orders 1 and 2, respectively. However, the standardized coefficient for frequency of exposure was positive and significant,  $\beta = .06$ ,  $p < .05$ . This indicated a slight tendency for more frequently seen PSAs to be reported as more persuasive. Frequency itself probably is not the proximal causal influence on perceptions of persuasiveness. Rather, the observed association likely reflects the fact that stations prefer to air the more compelling PSAs.<sup>4</sup>

The block of affect measures was entered last. It yielded the following results:  $R^2$  change = .237,  $F(6, 733) = 80.50$ ,  $p < .01$ . The sizable change

coefficient was an indication that the affect variables, as a group, had a substantial association with judgments of persuasiveness. The  $\beta$  weights for the individual affects also appear in Table 3. The standardized regression coefficients were as follows: *surprise*, .21,  $p < .01$ ; *puzzlement*,  $-.19$ ,  $p < .01$ ; *happiness*,  $-.00$ , n.s.; *fear*, .58,  $p < .01$ ; *anger*,  $-.13$ ,  $p < .01$ ; and *sadness*, .15,  $p < .01$ . Thus Hypothesis 1 was supported for all of the affects except happiness.

Assuming an alpha of .05, the statistical power to detect a small effect size ( $f^2 = .02$ ) in the regression analyses was never less than .96. Power to detect larger effects exceeded .96.

## Study 2

The primary purpose of Study 2 was to shed light on the mechanism(s) by which affect influences message acceptance. As mentioned earlier, the two possibilities that were pertinent to this project were heuristic processing and biased systematic processing. We examine each in turn.

### *Heuristic Processing and Affective Orientation*

Although affect must be present before it can be used heuristically, presence alone is insufficient to ensure that it will influence message acceptance. Booth-Butterfield and Booth-Butterfield (1990) argue that individuals differ in their characteristic tendency to use affect as a source of information. Their efforts to bring empirical support to this claim produced a 20-item self-report instrument, labeled the Affective Orientation Measure (AOM), that showed good internal consistency and a meaningful pattern of associations with a variety of validating variables. Overall, the authors present convincing evidence for the validity of the scale.

Relative to persons low in affective orientation, persons high in this trait depend more heavily on their feelings as a guide to behavior. Because Study 1 established that the predominant affective response to the AIDS PSAs was fear, and because fear should promote yielding to the advocacy, we expected that high AOMs would make greater use of that affect and its corresponding action tendency. Specifically,

**Hypothesis 2:** Affective orientation is positively related to message acceptance.

*Biased Systematic Processing*

An alternative to the notion that affect has a simple and direct effect on persuasion is the claim that affect may influence the valence of cognitive responses to a message that then, in turn, determine message acceptance. Mathur and Chattopadhyay (1991) placed one of two advertisements within either a happy or a sad television program. After viewing the program, subjects listed their thoughts about the advertisements. The results revealed that persons who viewed the happy program reported a greater number of positive thoughts about the commercials than did persons who viewed the sad program (see also Hsu & Price, 1993).

Petty et al. (1991) extended this line of research in two studies that showed the effects of manipulated mood on cognitive responses and the subsequent effects of cognitive responses on agreement with the message. Their results offered support for a biased processing account of the effects of mood. Importantly, however, this causal sequence of Affect → Cognition → Attitude was obtained only under conditions of high involvement with the topic. In the low-involvement conditions, the effect of affect on message acceptance was direct, that is, Affect → Attitude. These latter results were compatible with a heuristic model of the effects of affect.

Although we did not intend to manipulate involvement in the present study, in light of the possibility that subjects might consider the topic of HIV/AIDS as involving, we were prompted to consider the potential for biased systematic processing. In line with the logic of the dual-process models, we proposed the following hypotheses:

Hypothesis 3: Valence of affective response is positively related to the valence of the dominant cognitive response.

Hypothesis 4: Valence of the dominant cognitive response is positively related to message acceptance.

*Method*

## PARTICIPANTS AND PROCEDURES

A total of one hundred sixty-seven persons enrolled in undergraduate communication classes at a large midwestern university provided data for Study 2. Of that number, 115 reported their gender as female and 51 as male (1 person chose not to provide that information). Missing data slightly reduced this *N* for some analyses.



Data collection proceeded in two phases. In the first phase, subjects received a questionnaire designed to gather information about their sexual activity and knowledge about AIDS/HIV. That questionnaire included the AOM (Booth-Butterfield & Booth-Butterfield, 1990).

The second phase took place 1 to 3 days later, when subjects reported to the laboratory. Subjects were run either in pairs or individually, seated approximately 3½ ft in front of a 24-in. color television. They were separated from one another by a 3 × 5 ft styrofoam wall, and a personal computer was located slightly off to either their right or their left. The computers were used to display items designed to measure message acceptance and affective response. Data were recorded when subjects selected numerical keys that corresponded to scale values presented on the screen. After viewing a single PSA, subjects were allowed 2 min to write out their cognitive responses on a sheet of paper provided by the experimenter.

#### AFFECT ORIENTATION MEASURE

The AOM consists of 20 statements about people's feelings and tendency to use those feelings to guide their behavior (Booth-Butterfield & Booth-Butterfield, 1990). Each of the items was accompanied by a 5-point response scale that was anchored at each point: 1 = *strongly agree*, 2 = *agree*, 3 = *uncertain*, 4 = *disagree*, and 5 = *strongly disagree*. The 20-item aggregate yielded an alpha reliability of .87.

#### STIMULI

From the original pool of 31 PSAs, 12 were selected. Initially, those that did not elicit affect in the previous study were eliminated. From those remaining, 12 were chosen for their capacity to induce one or more of the affects under study. Each PSA concluded with one of three explicit recommendations: use a condom, protect yourself, or avoid multiple partners.

#### MEASUREMENT

Message acceptance was assessed with a single 7-point semantic differential item anchored at 1 = *not at all persuasive* and at 7 = *very persuasive*. Six affects were tapped by two items each: *surprise* (surprised, astonished), *puzzlement* (puzzled, perplexed), *happiness* (happy, cheerful), *fear* (fearful,

afraid), *anger* (angry, irritated), and *sadness* (sad, dismal). The computer program used to display the affect items generated a random order of presentation for each subject.

## Results

### MEASUREMENT ANALYSES

As before, confirmatory factor analyses were conducted on the affect indexes. Again the scales showed themselves to be unidimensional. The alpha reliabilities for the scales were as follows: *surprise*, .86; *puzzlement*, .79; *happiness*, .93; *fear*, .90; *anger*, .81; and *sadness*, .71. In this data set, the distributions were not so non-normal as to require transformation.

### COGNITIVE RESPONSE CODING

Inspection of the open-ended data revealed that some subjects had described affective responses to the PSAs. Because of the potential for confounding with the affect measures if these were not removed, coding proceeded in two steps. First, two trained coders independently examined each thought unit and classified it as either cognitive or emotional. Thought units were classified as emotional if they made direct reference to the affective state of the subject (e.g., "The PSA depressed me") or if the unit consisted only of a feeling word (e.g., "Scared!"). All other responses were considered cognitive. Agreement on this task was 100%. Across participants, the average number of affective responses was 1.21. Because we had taken close-ended measures of affect, these open-ended reports were not included in any of the subsequent analyses.

In the second step, coders assigned cognitive response units to one of four categories: *positive*, which indicated agreement with the advocacy of the message; *negative*, which indicated disagreement with the advocacy of the message; *neutral*, which reflected nonevaluative thoughts; and *irrelevant*, which captured those thoughts that had no bearing on the message or experimental situation. Kappa for this task was .82.

The average number of cognitive responses per subject was 4.35, a figure that decreased to 4.30 when irrelevant responses were eliminated. The fact that subjects generated so few irrelevant responses may be taken as evidence that they were attending to the message. A dominant cognitive response score was computed for each person by subtracting the number of negative cogni-

Table 4

*Study 2: Predicting Judgments of Persuasiveness*

Predictors and summary statistics	R <sup>2</sup> change	β
Block 1: Dominant cognitive response <i>F</i> (1, 162) = .06	.0004	
Block 2: Affect variables and AOM <i>F</i> (8, 155) = 5.22***	.202	-.02
Surprise		.30***
Puzzlement		-.24**
Happiness		.02
Fear		.35**
Anger		-.12
Sadness		.01
AOM		.16*

Note. AOM = Affective Orientation Measure.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

tions from the number of positive cognitions. The resulting difference variable showed a mean of .55, a standard deviation of 2.24, and a range that ran from -6 to +7.

#### HYPOTHESES 1, 2, AND 4: COGNITIVE RESPONSES, FEELINGS, AOM, AND MESSAGE ACCEPTANCE

A two-step regression analysis was used to test the hypotheses concerned with message acceptance. To examine the possibility of systematic processing (Hypothesis 4), the dominant cognitive response variable was entered in the first block. The affects and the AOM were entered in the second block. Order of entry was determined by two considerations. First, if the systematic processing account was obtained, then cognitions would be causally proximal to message acceptance. Order of entry should reflect that expectation. But, second, this order also provided the most liberal test of the systematic processing hypothesis and the most stringent test of the alternative heuristic processing account (Hypothesis 2).

The results of the first step in the regression analysis produced an *R*<sup>2</sup> change of .0004, *F*(1, 162) = .06, *ns*. Table 4 presents the standardized regression coefficient for dominant cognitive response, -.02 *ns*. Thus Hypothesis 4, which predicted an effect of cognitive response on message acceptance, was not supported.

The second block, which contained the affect variables and the AOM, produced an  $R^2$  change of .202,  $F(8, 155) = 5.22$ ,  $p < .001$ , an indication that the set of measures shared appreciable covariance with message acceptance. The  $\beta$  weights for the individual variables were as follows: *surprise*, .30,  $p < .001$ ; *puzzlement*,  $-.24$ ,  $p < .01$ ; *happiness*, .02, *ns*; *fear*, .35,  $p < .01$ ; *anger*,  $-.12$ , *ns*; *sadness*, .01, *ns*; *AOM*, .16,  $p < .05$ . Thus Hypothesis 1 (from Study 1), which predicted unique effects for each of the affects on message acceptance, was supported for surprise, puzzlement, and fear but not for happiness, anger, and sadness. Hypothesis 2, which predicted a positive association between the AOM and message acceptance, was supported.

Assuming an alpha of .05, the statistical power to detect a small effect size ( $f^2 = .02$ ) in the preceding and subsequent analyses was approximately .40. Given the same parameters, the power to detect a medium effect size ( $f^2 = .15$ ) was in excess of .99.

### HYPOTHESIS 3: VALENCE OF AFFECTIVE AND COGNITIVE RESPONSES

The third hypothesis proposed that affective valence would predict the valence of the dominant cognitive response. To assess that hypothesis, a regression analysis was conducted in which dominant cognitive response was the dependent variable and the six affects were predictor variables. The  $R^2$  change for the entire equation was .022,  $F(6, 160) = .61$ , *ns*. The individual regression coefficients showed a uniform absence of association with dominant cognitive response: *surprise*, .10; *puzzlement*,  $-.01$ ; *happiness*,  $-.00$ ; *fear*,  $-.15$ ; *anger*, .00; and *sadness*, .04, all of which were nonsignificant. Thus there was no support for Hypothesis 3.

As before, power to detect small and medium effects was .40 and .99, respectively. These power values suggest that we must be cautious about asserting that small effects do not exist. However, the likelihood of having failed to detect medium-sized effects is extremely small.

## Discussion

### *Affective Impact of AIDS PSAs*

Evidence shows that individuals' acceptance of a message is influenced by their affective state during message processing (Eagly & Chaiken, 1993). Fear is positively correlated with acceptance, but other affects, which might

be evoked by the same message, can reduce the impact of a persuasive appeal. Given that so many public health messages are fear appeals, we considered it important to study the feelings induced by health-oriented PSAs. Toward this end, we examined the affective outcomes associated with 31 AIDS PSAs previously classified as fear appeals.

The results of Study 1 revealed that most (61%), but not all, of the PSAs did induce fear in our subjects. This finding bolsters arguments in favor of using specific terminology to distinguish messages from their effects (D. O'Keefe, 1990, p. 127). For the sake of clarity, we might do well to adopt the term *threat appeals* for those messages that describe negative consequences for the message recipient (cf. Rosen, Terry, & Leventhal, 1982). This usage would help to make clear that *fear appeals* ought to have one characteristic beyond the specification of negative consequences: they should induce fear (see Sparks & Ogles, 1990, for a similar distinction).

Many of the PSAs generated feelings other than fear. All of the messages produced decrements in happiness. Moreover, all but 1 of the 31 messages in the sample influenced two or more affects. Slightly over half of the messages (52%) evoked changes in three different affects. These results accord well with Plutchik's (1980) contention that the experience of single emotions is the exception, not the rule. Further evidence of multiple affective responses is found in the correlations among the affects. As Table 2 makes apparent, there was considerable covariation among most of the affects under study. The happiness coefficients provide an important exception. Although happiness showed small but significant negative associations with fear and sadness, it was independent of the remaining affects. This independence warns against a simple bipolar conceptualization of affect. The absence of happiness should not be equated with the presence of negative affect.

### *Affects and Message Acceptance*

That fear appeals have multiple affective outcomes is important to developing health communication campaigns for at least two reasons. First, fear promotes message acceptance.<sup>5</sup> Other feelings may have similar effects. If so, public health messages could be made more effective by including components that would induce those affects. But, second, other affects might function to *inhibit* message acceptance. Message designers should avoid evoking those particular affects whenever possible. Our results indicate that both possibilities should be taken seriously.

## AFFECTS THAT ENCOURAGED MESSAGE ACCEPTANCE

Certain affects fostered acceptance of the persuasive advocacy: surprise, fear, and sadness. In our data, the most potent of these affects was fear. Consistent with the existing body of research on fear appeals, fear engendered message acceptance (see Witte, 1994, for an exception). This finding is also compatible with our theoretical analysis of fear. The action tendency for fear encourages submission to the advocacy when escape from the stimulus is not possible.

Surprise also predicted message acceptance in both studies. Because surprise promotes focus on the message, the positive relationship between surprise and acceptance may result from enhancement at the comprehension stage of message processing rather than yielding to the content of the message itself (McGuire, 1985). This result also provides an interesting affective parallel to those cognitive theories of persuasion that contend that novel information is essential for attitude change (e.g., Morley, 1987; Morley & Walker, 1987).

Sadness was positively associated with perceptions of persuasiveness in Study 1 but not in Study 2. The discrepancy may be a function of sampling error. Alternatively, it may be attributable to the fact that only one of the subset of PSAs used in Study 2 was very effective at evoking sadness. Thus restriction in range may account for the null findings in the second investigation.

If the effect for sadness is genuine, it poses an interesting theoretical problem. Efforts to assess the effects of negative moods on persuasion usually have operationalized mood by asking subjects to recall a sad event (Schwarz, Bless, & Bohner, 1991). One finding to emerge from that line of research has been that sadness promotes systematic processing. To test that relationship in our data (i.e., Study 2), a correlation was computed between sadness and total number of relevant cognitions. The result,  $r(167) = -.03$  *ns*, indicated that sadness and depth of processing were independent in this data set. One important difference between our investigation and earlier work is that previous studies have used messages with more developed argumentative structures. The dual-process models claim that heuristic processing will occur when systematic processing is not possible. Our use of brief, simple messages may have effectively precluded an extensive analysis of message content.

## AFFECTS THAT DISCOURAGED MESSAGE ACCEPTANCE

A different set of affects, puzzlement and anger, inhibited the effectiveness of public health messages. Let us consider each in turn. The negative relationship between puzzlement and perceived persuasiveness was observed in both data sets. To interpret this finding, recall that puzzlement arises from the perception of an anomaly in the environment. The associated action tendency encourages the individual to seek understanding by allocating additional cognitive resources to resolving the anomaly. Yet, given that PSAs lack complex argumentative structures, whatever puzzles a viewer is unlikely to be resolved by additional scrutiny of the message. Because the inability to reduce uncertainty is frustrating, puzzlement and message acceptance should be inversely related to one another. This negative effect on persuasion suggests a problem area for producers of AIDS PSAs. It also implies that message acceptance could be enhanced by the use of clear and unambiguous appeals.

Anger also showed a negative association with judgments of persuasiveness. Despite the similarity in the sign and magnitude of the coefficients across the two studies, the regression weight was not significant in Study 2. We are inclined to interpret the null findings of Study 2 as resulting from the lower power provided by fewer degrees of freedom. In conjunction with the results of earlier work (Dabbs & Leventhal, 1966; Leventhal & Singer, 1966; Leventhal et al., 1965), our findings point toward a reliable inverse relationship between anger and message acceptance.

## AFFECTS SEEMINGLY UNRELATED TO MESSAGE ACCEPTANCE

Happiness was the only affect that did not predict message acceptance. This null result was not due to restriction in range, as 100% of the PSAs produced a significant decline in this positive affect (Study 1). This latter result is hardly surprising given the topic of the PSAs. Yet, the absence of an association between happiness and persuasion seemingly contradicts other reports that found a direct relationship (e.g., Petty et al., 1991). Key to interpreting this apparent discrepancy is consideration of the type of change that our messages produced. Previous studies have induced an *increase* in positive affect, whereas the AIDS PSAs provoked a *decrease* in happiness. According



to our arguments regarding the function of happiness, it is the presence of this affect, not its absence, that activates the action tendency. Thus, the lack of an effect for happiness is consistent with the theory.

#### THE UNIQUE EFFECTS OF DIFFERENT AFFECTS

Apart from the specific relationships between the affects and message acceptance, the results are consistent with the general claim that different affects possess different functions, signal values, and action tendencies. Support for this proposition is seen in the fact that most of the affects produced effects on message acceptance that were discriminable from one another. This result lends credence to the argument that future research should move beyond examining affect solely in terms of valence. We must begin to consider the unique properties of different feeling states and their potential for unique effects (Dillard & Wilson, 1993). The results for fear and anger are especially compelling on this point. Although both affects are negatively valenced, they show opposing effects on message acceptance.

#### *Linking Affect to Message Acceptance*

An important theoretical question concerns the mechanism by which affect influences message acceptance. In Study 2, we tested two possibilities: biased systematic processing and heuristic processing. The systematic processing account failed in two respects. First, none of the affects was reliably related to dominant cognitive response. Further, dominant cognitive response failed to predict message acceptance. It is important to note that this account did not fail because respondents were not generating cognitive responses. In fact, the average number of relevant thoughts made to each PSA in Study 2 was 4.30, a number that is comparable with those in many other studies that show support for the cognitive response model (e.g., Cacioppo, 1979). Thus, while our subjects engaged in fairly extensive cognitive activity, that activity bore no reliable association with judgments of message persuasiveness.<sup>6</sup> Lack of support for the systematic account indicated that an alternative explanation was needed.

Two pieces of evidence argued for acceptance of the heuristic account. First, the affects showed reliable associations with message acceptance in both studies. The results were compatible with our analysis of the functions, signal value, and action tendencies of the affects (see Table 1). Second, the AOM, an index of individuals' tendency to use their feelings as a guide for

decision making, showed the anticipated positive relationship with message acceptance. Although the magnitude of the effects was not large, it is important to bear in mind that the messages evoked multiple affects, some of which encouraged message acceptance whereas others discouraged message acceptance. Conflicting action tendencies no doubt weakened the strength of the relationship between AOM and message acceptance.

### *Limitations and Future Research*

Theoretical and applied concerns are often viewed as antithetical to one another. Although we would dispute the generality of that view, the tension between theory and application is readily apparent in one aspect of this investigation. Persons of an applied bent might critique our dependent variable as too broad, as too distant from behavior, and as lacking external validity. Of course, it would have been possible to substitute measures of behavior or behavioral intention for judgments of perceived persuasiveness. But to expect effects on behavior with a topic, such as AIDS, for which individuals already possess a great deal of prior knowledge, would be to have extremely optimistic expectations regarding the power of PSAs. Thus, we chose to emphasize the external validity of our stimulus set, and then selected a dependent measure that we thought would be responsive to variations in AIDS PSAs.

A crucial issue for future research concerns how messages produce affective responses. What features of these and other health communications underlie the production of affect? We focused our efforts on showing that PSAs do evoke affect and that those affective responses figure into the persuasive process in significant ways. Establishing the existence of a link between affect and message acceptance was an important first step. But future inquiry is needed that illuminates the message features responsible for affect production. In such research, it would be a mistake to concentrate solely on the semantic content of the message. There is evidence that individuals respond emotionally to changes in facial displays (McHugo, Lanzetta, Sullivan, Masters, & Englis, 1985) and vocalic cues (Scherer, 1984). The most productive tack for future research will likely be to consider both verbal and nonverbal components of public health messages.

Research on the message-affect link should be sensitive to the moderating conditions inherent in this study and other studies. For instance, our thinking concerning the effects of fear on message acceptance was informed by the knowledge that subjects would confront the messages in a forced viewing situation. However, fear can be instantiated behaviorally as freezing, fleeing,

or submitting depending on the circumstances. Had participants been given the opportunity to switch off the television or to escape the message via some other route, our findings might have looked quite different.

Another potentially important moderator variable is the audience itself. Because our aim was to demonstrate the generality of the affect-persuasion link, we made no effort to partition our college student sample into subgroups of any sort. However, it seems likely that different audiences might manifest distinct affective response patterns to the same message. We can imagine that segmenting the audience in terms of age or level of sexual activity might prove illuminating, but a firmer theoretical base is needed before pursuing either grouping.

### *Reprise*

The two studies reported here suggest that affect may play an important role in determining the degree to which persuasive messages are accepted. Some affects facilitate persuasion, whereas others inhibit it. These knowledge claims become relevant to health campaigns to the extent that campaigns design and produce messages that arouse feelings in message recipients. Fear appeals, such as those used in AIDS/HIV campaigns, do much more than scare people; they evoke a variety of affective responses that have separate and unique effects on persuasion. To construct effective public health messages, campaign designers must begin to give explicit attention to the affective outcomes of their persuasive appeals.

### Notes

1. We thank Kathryn Greene for her comments on an earlier version of this article and Debra Greenberg for assistance with data collection.

2. We do not mean to suggest that formal theories of fear appeals do not exist. However, we doubt that individuals who lack training in persuasion theory have much knowledge of or appreciation for those formal theories. Laypersons have their own folk theories of persuasion that exist independent of social scientific theories.

3. The dual-process models imply at least two other mechanisms by which affect might influence persuasion. Affect could enhance or inhibit an individual's *ability* to process a message. This is the position developed by Mackie and Worth (1989), who have attempted to demonstrate that positive mood reduces the amount of cognitive capacity available for message processing (but see Smith & Shaffer, 1991). Highlighting another alternative, Schwarz, Bless, and Bohner (1991) contend that the effects for positive mood are best explained by differences in individuals' *motivation* to process the message. Although both issues are important and have generated considerable research interest, they are not the focus of this project.

4. We base this conclusion on conversations with television station personnel and with National Cancer Institute administrators. Of course, other interpretations are possible. As one reviewer pointed out, Zajonc's (1980) mere exposure hypothesis might also suggest a positive relationship between frequency of exposure and message acceptance.

5. Readers should note that fear *appeals* typically contain (a) a threat component that describes the likelihood and severity of the noxious consequences and (b) an efficacy component that describes the effectiveness of the response and the likelihood that message recipients can execute the response. Both components may be necessary to the effectiveness of fear appeals.

6. Of course, this should not be interpreted to mean that systematic processing never occurs or that it is not, in many instances, a more veridical explanation of persuasion than the heuristic account. In fact, the heuristic systematic model's concurrent processing principle asserts that systematic and heuristic processing may take place simultaneously (Chaiken et al., 1989).

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