The Role of Fear in Persuasion

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ABSTRACT

Previous research on fear/threat appeals has correlated fear intensity with persuasion. However, fear might influence persuasion in at least four conceptually distinct ways: (a) the proclivity to experience fear, (b) the rise from baseline to peak, (c) peak intensity, and (d) the decline from peak to postmessage fear. A study was conducted in which 361 participants read a message that first described the dangers of influenza, then advocated obtaining a free vaccination. Significant positive correlations were observed between tonic, that is, trait-like, activation of the behavioral-inhibition system (BIS) and various indices of fear arousal. Nonsignificant correlations were observed between the behavioral-activation system (BAS) and the same indices. Both rise and peak measures of fear predicted persuasion, but decline in fear had no discernible impact on persuasion. © 2004 Wiley Periodicals, Inc.

The year 1953 marks the publication of the first social scientific study of fear appeals (Janis & Feshbach, 1953). Since that time, researchers have shown an unflagging interest in how individuals perceive, process, and react to messages that contain threatening information, and studies of fear appeals now number in the hundreds (Rogers & Prentice-Dunn, 1997; Witte & Allen, 2000). Although classic theories regard fear as causally primary (e.g., Janis, 1967; Leventhal, 1971), and contemporary theories regard fear as a secondary cause of the perceived severity of the threat (e.g., Rogers & Prentice-Dunn, 1997; Witte, 1992), all theories of fear appeals attempt to specify how fear works.

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Surprisingly, there is relatively little research aimed at illuminating exactly how fear operates to directly (classic) or indirectly (contemporary) produce persuasion. One general strategy for mending this situation is to bring fear-appeal research together with current work on emotions (Dillard, 1994). The present study is based on a pair of assumptions that are wholly noncontroversial in the emotions literature. One is the assumption that when faced with the same message or circumstances, some individuals are more prone to experience a particular emotion or set of emotions than are others (Bates, 2000). The second assumption is that emotions are dynamic phenomena that vary in intensity over time. They can be understood to possess three properties that characterize dynamism: onset or rise, peak, and offset or decay (Frijda, 1986).

The theoretical perspective in the present study concerns four distinct aspects of emotional responding. The *reactivity* aspect emphasizes individual differences in the propensity for fear arousal and the subsequent effect of fear on persuasion. The *rise or increase* aspect suggests persuasion is a function of the magnitude of the difference between baseline fear and peak fear. In contrast, the *peak* aspect highlights the level of fear aroused regardless of the individual's state of fear prior to the message. Finally, the *decrease* aspect implies the possibility that it is the degree to which fear is reduced, presuming that it is first aroused, that determines persuasion (Dolinski & Nawrat, 1998; Janis & Feshbach, 1953). Before describing the study, the theory and research associated with each aspect is reviewed below in more detail.

INDIVIDUAL REACTIVITY TO FEAR APPEALS

Positive and negative affect are thought to be manifestations of two underlying physiological systems whose purpose is to guide behavior (Thayer, 1989; Watson, Weise, Vaidya, & Tellegen,1999). The function of the *behavioral-approach system* (BAS) is to initiate incentive-motivated action (Davidson, 1993; Depue & Collins, 1999; Gray, 1990). The BAS is sensitive to cues of reward, avoidance of punishment, and escape from punishment. Activation of the BAS produces positive affect. The purpose of the *behavioral-inhibition system* (BIS) is to inhibit actions that may lead to aversive outcomes (Davidson, 1993; Gray, 1990). The BIS is sensitive to cues associated with punishment, nonreward, and novelty. Activation of the BIS produces negative affect.

Individual differences in the tonic (chronic) activation level of the two behavioral systems underlie a variety of behavioral response tendencies. For instance, Depue and Collins (1999) explain extraversion in terms of variations in the tonic activation level of the BAS. Left prefrontal brain hemisphere activity, an indicator of tonic BAS activation, has been related to decreased vulnerability to depression (Kline, Allen, & Schwartz, 1998). Neuroticism, an indicator of tonic BIS activation, has been related to increased reactivity to everyday stressors (Bolger & Schilling, 1991). Important to each of these applications is the notion that individual differences reflect variations in sensitivity to different types of stimuli. “Sensitivity ultimately means reactivity of the neurobiology associated with a motivational system” (Depue & Collins, 1999, p. 491).

Given that cues of punishment and nonreward are prevalent in everyday situations, and assuming that persons high in tonic BIS activation are more sensitive to these cues, then the level of tonic BIS activation should be directly correlated with self-reports of fear *prior to* exposure to a threat appeal. Put differently, persons with a highly active inhibition system should be generally more fearful than persons with a less active inhibition system. Thus, the first hypothesis is as follows:

H1: BIS is positively associated with premessage fear.

A defining feature of threat appeals is that they warn of the negative consequences that will accrue to message recipients if they do not alter their behavior (Janis & Feshbach, 1953; Leventhal, 1971; Rogers, 1975; Witte, 1992). In other words, they present cues of punishment or nonreward. Accordingly, greater sensitivity to such cues should manifest itself in a greater increase in fear and a higher peak of fear. Further, on the premise that an active (vs. relatively inactive) BIS is characterized by greater reactivity (see especially the studies by Gable, Reis, & Elliot, 2000, demonstrating this), it can be expected that the system would less readily return to baseline. By this logic, BIS should exhibit an inverse relationship with the amount of reduction in fear occasioned by the end-of-message recommendation. Hence, the second hypothesis is that:

H2: BIS is positively associated with fear increase, and with peak fear, and negatively correlated with the fear decrease.

The BAS is held to be the source of positive, but not negative, affect (Davidson, 1993; Depue & Collins, 1999; Gray, 1990). If that claim is accurate, then the BAS should show no appreciable correspondence with a negative emotion such as fear, either before or after exposure to a fear appeal. The third hypothesis is therefore that:

H3: BAS is unrelated to premessage fear, fear increase, peak fear, or fear decrease.

PEAK FEAR

Appraisal theories of emotion focus on the cognitive antecedents of emotional experience (e.g., Frijda, 1986; Lazarus, 1991; Oatley, 1992; Scherer, 1984; Roseman, Weist, & Swartz, 1994). At the broadest level, these theories assert that negative emotions arise from the appraisal that the environment is incongruent with the individual's goals and that positive emotions follow from appraisals of compatibility between goals and environment. With regard to fear more specifically, these theories contend that fear will be aroused to the extent that individuals perceive the stimulus to be (a) important, (b) negatively valenced, (c) impending, (d) one that will require considerable effort to deal with (i.e., presents an obstacle), and (e) beyond the control of the actor.

Some previous research has drawn on appraisal theories as a means of providing insight into the persuasive effects of emotion (Dillard, 1994). For example, the work of Dillard and his colleagues has examined the association between emotions and the perceived effectiveness of public service advertisements by analyzing properties of emotion suggested by appraisal theories (Dillard & Peck, 2000, 2001; Dillard, Plotnick, Godbold, Freimuth, & Edgar, 1996). The theory is that emotions shift individuals into states that are designed to address particular goal–environment relations (Frijda, 1986; Lazarus, 1991; Oatley, 1992; Roseman et al., 1994; Scherer, 1984). This shift involves coordinated alterations in perceptual, cognitive, expressive, and physiological systems that, in the aggregate, influence opinion change. From this position, it is emotional intensity (i.e., the peak level reached) that is persuasive. And, though they do not adopt the aforementioned theoretical position, various meta-analysts of the fear literature consistently conclude that there is a positive relationship between fear intensity and persuasion (Boster & Mongeau, 1984; Mongeau, 2000; S. R. Sutton, 1982; Witte & Allen, 2000). The fourth hypothesis, accordingly, is that

H4: Peak fear is positively associated with persuasion.

FEAR INCREASE

Among the many theories of emotion, the Carver and Scheier (1999) control theory of behavior is perhaps the most explicit in its treatment of affect dynamics. The theory holds that individuals possess goals that they strive to attain. For example, one goal that individuals might be expected to have is that of their own continued well being. A cognitive monitoring system assesses progress toward or away from goals, whereas a meta-monitoring system operates simultaneously to evaluate the direction and rate of progress. According to Carver and Scheier, it is the meta-monitoring system that is responsible for the production of affect. Negative affect ensues when progress toward a goal is less than expected, whereas positive affect is the result of greater-than-expected progress. Extension of this logic suggests a possibility that is distinct from those considered thus far. Perhaps persuasive impact is determined by the *upward change* in fear, indicating an appraisal of straying from the goal, rather than peak fear. At first glance it might appear that this possibility is wholly conflated with that of peak fear. If the tonic affective state of all individuals at m1 is assumed to be zero, then the magnitude of fear arousal (i.e., m2 – m1) will be identical to peak fear intensity (i.e., m2). However, the reactivity perspective suggests that the assumption of equal and zero priors is unlikely to hold. Individual differences in tonic BIS activation will produce differences in fear levels at m1, thereby allowing there to be differences in fear increase even if all individuals experienced the same peak level. Consequently, this perspective leads to the hypothesis that:

H5: Fear increase is positively associated with persuasion.

FEAR DECREASE

The fear-decrease perspective focuses on the offset of fear. In the arena of fear appeals, fear-drive theory offers the best-known prediction of a decrease effect (Janis & Feshbach, 1953; see also Hovland, Janis, & Kelly, 1953). Grounded in learning theory, the fear-drive model posits reinforcement as the main mechanism for opinion change. A message is reinforcing the recommended behavior to the extent that the message first induces fear, then alleviates it by providing cues to appropriate action. A convincing test of the theory would require measuring fear at least twice: once after the arousal component of the message (i.e., the threat) and once after the abatement component (i.e., the recommendation). Curiously, there seem to have been no studies since the publication of Janis and Feshbach (1953) that have utilized such a design [though see the studies by Rossiter and Thornton, described in their article in this Special Issue—Editor's note].

There are two lines of research that bear at least indirectly on the drive-reduction hypothesis. In one approach, "other" variables, notably the position of the recommendations, were manipulated that could be expected to interact with level of fear if the drive-reduction hypothesis were true (Dabbs & Leventhal, 1966; Leventhal & Singer, 1966; Leventhal, Singer, & Jones, 1965). None of these investigations showed the predicted interaction (Higbee, 1969, offers a summary and review). Although valuable in many respects, the evidence that these studies bring to bear on the question of fear and persuasion is circumstantial because it depends on "other" variables. It cannot, therefore, be viewed as conclusive.

The other pertinent line of research utilized false feedback about physiological arousal as a predictor of persuasion. One study found support for the drive-reduction hypothesis (Harris & Jellison, 1971) but subsequent investigations have given no indication that fear decrease produced the persuasion (Giesen & Hendrick, 1974; Hendrick, Giesen, & Borden, 1975). However, there are reservations about equating the false-feedback procedure with genuine emotion. For one, it involves only the cognitive system, rather than the multiple-system activation that most writers agree defines an emotion such as fear. Moreover, to accept the false-feedback data as indicative of emotion is to make the far-fetched assumption that an emotional state inferred from a meter reading is functionally equivalent to the experience of an emotion. The false-feedback data are questionably relevant to the drive-reduction hypothesis.

Moreover, one recent line of research suggests that there may be merit in the fear-decrease perspective. The fear-then-relief model explicitly identifies the offset of fear as a proximal cause of compliance. In a series of five experiments, Dolinski and Nawrat (1998) demonstrated that individuals who experienced anxiety that was abruptly terminated were more likely to agree to a request than are persons who were not made anxious. They also carefully ruled out a variety of alternative explanations.

In sum, there are reservations about the extent to which prior research has definitively rejected the fear-reduction hypothesis, and therefore the final hypothesis predicts that fear reduction will be related to persuasion:

H6: Fear decrease is positively associated with persuasion.

A MESSAGE-COMPONENT APPROACH TO THE STUDY OF FEAR AND PERSUASION

It is evident that a test of the hypotheses outlined above requires a research design in which fear is measured at multiple points in time. What may be less apparent is the degree to which fear appeals lend themselves to clear judgments as to when and how often those observations should be made.

It is widely held that fear appeals—in theory—consist of two parts (Hale & Dillard, 1994; Leventhal, 1971; Rogers & Prentice-Dunn, 1997; Witte, 1992). The first is a threat component, which is information pointing out the nature of the danger and, usually, the susceptibility of members of the target audience to that danger. The second part is an action component, which is information about the efficacy of the recommended response and encouragement of the self-efficacy of the members of the target audience to carry out that response. However, in practice, a fear appeal may omit the recommendation part of the message if the recommended avoidant action is obvious; road-safety messages, for instance, are often fear only [again, see the Rossiter and Thornton article—Editor]. Fear appeals should be most effective when the threat component precedes the recommendation component (A. R. Cohen, 1957; Gleicher & Petty, 1992; but see Leventhal & Singer, 1966). Consequently, it seems clear that fear should be assessed prior to the threat component of the appeal, immediately after participants are exposed to the threat component, and again immediately after presentation of the recommendation component. Indeed, Dillard and Meijnders (2002) have recommended the use of *message-component research designs*—that is, designs that break messages into their constituent parts, assess emotional responses to each element of the message, and use the resulting emotional change measures as predictors of persuasion. Clearly, the design called for in the current study is one type of message-component design. Although well suited to the questions that motivated this investigation, however, the multiple measurement occasions pose a threat to internal validity by introducing the potential for reactive measurement. This raises the following research question:

> **RQ1:** Will a design in which participants are *interrupted* after the threat component to provide data yield different results from one in which they provide data only after presentation of the entire message?

METHOD

Overview

Participants in the study read a message that warned of the dangers of influenza, then recommended vaccination. Participants completed a questionnaire that measured their tonic levels of BIS and BAS activation, their fear response to the message, and their estimate of the likelihood that they would get a vaccination.

Participants

The sample for the study initially included 445 students enrolled in courses at the University of Wisconsin—Madison. Each student received a small amount of extra credit in return for participation. Following data collection, a series of screens were applied that reduced the final sample size. Four participants were removed from the data because they had received a flu vaccination prior to the experiment. A further five were removed due to missing data on one or more of the variables. Next, four respondents, three who were allergic to eggs and one who was pregnant, were removed because flu vaccinations are contraindicated for persons with either condition (and the message informed them of these contraindications). Finally, to increase variance in the dependent measure, 70 participants were removed, which were 16% of those remaining, who reported, prior to the message, that the likelihood that they would obtain a vaccination was greater than 90%. Application of these screens resulted in a final sample size of 361.

Design

The experimental design was 2×2 between subjects, with one repeated measure. One between-subjects factor, level of threat, was included to induce an expected variation in fear; level of threat was manipulated by creating two versions of a message that varied in severity (described below). The other between-subjects factor, measurement condition, was included because it enabled assessment of the extent to which the measurement procedures influenced the outcome of the study. Participants in the *interrupted* condition provided fear ratings prior to the message, immediately after reading the threat component of the message, and immediately after reading the recommendation component. In contrast, participants in the *noninterrupted* condition provided fear ratings prior to the message, then read the message in its entirety before providing fear ratings again—ratings that focused on each of the two message components retrospectively.

Message Stimuli

To construct the message stimuli, information from a variety of professional health resources was collected. According to U.S. government statistics, influenza and influenza-related pneumonia together are the sixth commonest cause of death in the United States (http://www.cdc.gov). Also, influenza can exacerbate existing medical conditions (especially asthma, heart disease, emphysema, diabetes, or AIDS) (http://www.cdc.gov). The arguments advocating vaccination against influenza were supported by evidence from expert sources (e.g., the U.S. Centers for Disease Control and Prevention and the World Health Organization) and were presented in both narrative and statistical forms in each message. Table 1 provides a summary of message content. Two versions of the message, low threat and high threat, were created. The high-threat version contained more vivid language and a more personal narrative than did the low-threat version (full texts of the messages are available from either author). Both versions followed a problem–solution format in which the threat component of the message preceded the recommendation component.

Measures

BIS and BAS Measures. Tonic levels of BIS activation and BAS activation were assessed with the use of the Carver and White (1994) measure. Participants responded to 20 items in terms of 4-point ratings where 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree,* and 4 = *strongly agree.* Sample items from the BIS scale include “If I think something unpleasant is going to happen I usually get pretty worked up” and “I worry about making mistakes.” Sample items from the BAS scale include “When I get something I want, I feel excited and energized” and “When I want something I usually go all-out to get it.” Evidence of the validity of the BIS and

Table 1. Description of the Fear/Threat Appeal.

Threat Component
Consequences of the flu and prediction for rates of infection in the upcoming flu season.
Story about how a flu infection affected one student's social and academic welfare.
Influenza and influenza-related pneumonia are the sixth leading cause of death in the U.S.
Discussion of viral mutations and flu pandemics.
Recommendation Component
Benefits of flu vaccinations.
Dangers of flu vaccinations for those who are pregnant or allergic to eggs.
Reasons for renewing flu vaccinations annually.
How to take part in the University Health Service's flu vaccination program

BAS scales can be found in studies that demonstrate covariation between the two scales and EEG activity (Harmon-Jones & Allen, 1997; S. K. Sutton & Davidson, 1997).

The factor structure of the scales was evaluated with the use of the SPSS 7.5 principal-axis routine. Because two factors were expected, the solution was constrained to two factors and oblimin rotation of the factors was specified. Although some items exhibited substantial cross loadings, all of them showed their highest association with the intended factor. From the items, a 10-item BIS scale and a 10-item BAS scale were constructed as in the Carver and White (1994) article. Coefficient alpha internal consistency reliability was 0.78 for the BIS measure and 0.82 for the BAS measure. The items were summed within scales, then divided by the number of items, thereby returning the variables to a 1–4 metric. Descriptive statistics for BIS and BAS are given in Table 2.

Fear. To report their fear, participants responded to three items—*fearful, afraid,* and *scared*—using a 5-point rating anchored at 0 with *none of this feeling* and at 4 with *a great deal of this feeling.* The items were administered three times (coefficient alpha was 0.83, 0.94, and 0.91 at times 1, 2, and 3, respectively). This permitted construction of four indices of fear. The first measure assessed *premessage fear*. The second measure asked participants to report on their fear level immediately after reading the threat component of the message, and thus assessed *peak fear*. *Fear increase* was derived by subtracting the first measure from the second (m2 – m1) for each participant. The third measure asked participants to report on their fear level after reading the recommendation component of the appeal. The difference between the second and third fear scores constituted *fear decrease* (m2 – m3). For clarity of interpretation in later analyses, it is important to note that the increase and decrease measures were constructed such that positive values indicated more of the property under study, that is, more increase and more decrease.

Table 2. Correlations and Descriptive Statistics.

	1	2	3	4	5	6	7
1. BIS	—						
2. BAS	.12*	—					
3. Premessage Fear (m1)	.23**	–.04	—				
4. Increase (m2–m1)	.11*	.09	–.31**	—			
5. Peak (m2)	.23**	.07	.20**	.87**	—		
6. Decrease (m2–m3)	.16**	.08	.01	.68**	.71**	—	
7. Persuasion	–.04	.05	–.01	.18**	.18**	.16**	—
Mean	3.01	3.21	.30	1.00	1.30	.76	17.55
SD	.56	.40	.58	1.14	1.11	.97	29.73

Note. N = 361; *$p < .05$. **$p < .01$.

Persuasion. Both before and after reading the message, participants were asked the following question: "All things considered, how likely is it that you will get a flu vaccination from University Health Services during the 1999–2000 school year?" The response scale ranged from (0) *certain that I will not* to (100) *certain that I will,* with numeric anchors at 10-point intervals. *Persuasion* was assessed by computing for each participant the shift in likelihood from the premeasure to the postmeasure such that positive values indicated more persuasion.

RESULTS

Effects of Threat and Measurement

The effects of the experimental manipulations were tested by a multivariate analysis of variance that treated threat (high vs. low) and measurement condition (interrupted vs. noninterrupted) as predictors. The four fear indices and persuasion were the dependent variables (see Table 1 for descriptive statistics). The results revealed a significant effect for level of threat [F (4, 354) = 15.23, $p < .001$], a nonsignificant effect for measurement [F (4, 354) = .25, $p = .90$], and a nonsignificant interaction [F (4, 354) = .25, $p = .90$]. Inspection of the univariate results indicated that the message effect occurred for fear increase, peak fear, fear decrease, and persuasion. Thus, the threat manipulation did produce variance in the fear measures, but did not indicate that the measurement procedures were reactive (RQ1). Consequently, the results were collapsed across measurement conditions in all subsequent analyses.

The effect of threat on fear is graphed in Figure 1. To supplement the graphic, a series of tests were conducted that contrasted the high-threat and low-threat groups on fear at each of the three time points. The pre-

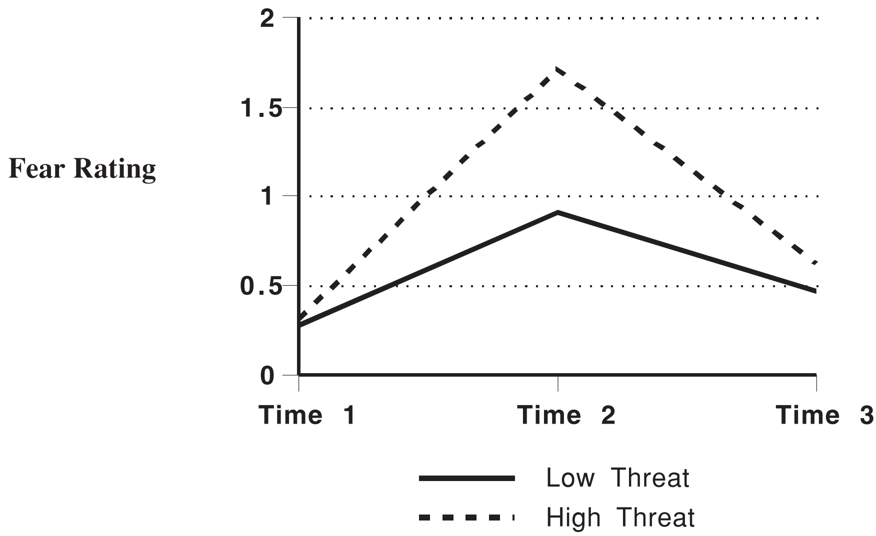

Figure 1. Mean level of fear reported by high-threat and low-threat groups at times 1, 2, and 3.

message contrast yielded t (359) = 0.36, p = .71, r = .02 (M_{high} = 0.30, SD = 0.59 vs. M_{low} = 0.28, SD = 0.56), which confirmed the absence of a demonstrable difference between the high and low threat groups prior to the message. The results for the post-threat comparison were t (359) = 7.25, p < .0001, r = .36 (M_{high} = 1.70, SD = 1.14 vs. M_{low} = 0.91, SD = 0.93). These findings show an effect of threat on fear almost identical to the average effect of r = .35 reported in Mongeau's (2000) meta-analysis. The mean rating of fear on the 0–4 scale suggests that the high threat produced moderate rather than high fear, on average, among participants. The corresponding values for the postrecommendation comparison were t (359) = 1.69, p = .09, r = .09 (M_{high} = 0.61, SD = 0.85 vs. M_{low} = 0.47, SD = 0.74). This finding suggests that persons who read the high-threat message remained slightly more fearful than those who read the low-threat message, even after both had read the recommendation component of the message. In total, these results suggest that the messages aroused and reduced fear, and that the high-threat message did both to a greater degree than the low-threat message. Hence, the manipulation successfully produced the variation in fear responses that was necessary for testing the hypotheses. The hypothesis tests, therefore, were conducted on the data for both ads combined.

H1–H3: Reactivity

H1 predicted that individual differences in behavioral inhibition tendency, BIS, are positively associated with premessage fear. The first entry in the leftmost column of Table 2 shows a significant positive correlation of 0.25 ($p < .025$, one-tailed), which offers support for the first hypothesis.

H2 anticipated a series of associations between BIS and the three dynamics aspects of fear arousal. The correlations in the first column of the table of 0.12 ($p < .025$, one-tailed), for fear increase and 0.26 ($p < .025$, one-tailed) for peak fear are both in line with expectations. However, the sign of the association between BIS and *fear decrease* ran counter to prediction: $r = .18$ ($p < .05$, two-tailed).

H3 posited a lack of association between BAS and the fear indices. The pertinent results appear in the second column of Table 2. The correlations are –0.04, 0.09, 0.07, and 0.08 for premessage fear, fear increase, peak fear, and decrease, respectively. Although all four correlations were nonsignificantly different from zero at $p < .05$, two-tailed, the significance test alone is not a convincing means of assessing a no-difference hypothesis. Rather, a power analysis is needed (Cohen, 1987). With an N of 361 and two-tailed alpha of 0.05, power is 0.46 for small correlations (i.e., $r = .10$) and greater than 0.99 for moderate (i.e., $r = .30$) and large correlations (i.e., $r = .50$). Thus, although the possibility of a small relationship cannot be ruled out, H3 is clearly supported for moderate to large associations.

H4–H6: Increase, Peak, and Decrease

H4–H6 predicted positive associations between persuasion and fear increase, peak fear, and fear decrease, respectively. As shown in the bottom row of correlations in Table 2, the simple correlations support all three predictions. They are 0.18 ($p < .005$, one-tailed) for fear increase, 0.18 ($p < .005$, one-tailed) for peak fear, and 0.15 ($p < .005$, one-tailed) for fear decrease. However, because these indices were themselves correlated, a method was needed that allowed more stringent comparisons between perspectives, namely, regression analysis. For each analysis, persuasion, which is the change in likelihood of obtaining a flu vaccination, served as the dependent variable. The independent variables were entered in two blocks. The first block contained one of the three fear indices, whereas the second block contained a different fear index that was being contrasted with the first. Because of collinearity among the fear indices, only two tests per equation were conducted. Each equation was run twice, in each case reversing the order of entry of the two variables that were to be contrasted. In this way, each predictor was given the opportunity to consume as much variance in the dependent variable as possible prior to its competitor. Comparing the results obtained from different entry orders helped to clarify the contribution of each perspective.

The results of the regression analyses are presented in Table 3, in three parts. In the upper part of the table, the fear increase and peak fear predictors are compared. Inspection of the R^2 values in the first two rows reveals coefficients that are very similar. When fear increase is entered first, it is statistically significant, but peak fear is not [Eq. (1)]. When

Table 3. Regression Analyses Predicting Persuasion from Fear Increase, Peak Fear, and Fear Decrease.

Equation 1		Equation 2	
Block	R^2	Block	R^2
	Fear Increase vs. Peak Fear		
1. Increase	.033**	1. Peak	.034**
2. Peak	.003	2. Increase	.002
	Peak Fear vs. Fear Decrease		
1. Peak	.034**	1. Decrease	.025**
2. Decrease	.001	2. Peak	.011*
	Fear Increase vs. Fear Decrease		
1. Increase	.033**	1. Decrease	.025**
2. Decrease	.002	2. Increase	.011*

Note. N = 361; $^*p < .05$. $^{**}p < .01$.

peak fear is entered first, it is statistically significant, but fear increase is not [Eq. (2)]. The regression analyses were unable to provide clear evidence in favor of one perspective over the other because of the degree of collinearity between the two predictors ($r = .87$).

In the middle part of the table, peak fear is contrasted with fear decrease. In Equation (1), peak is significant when it is entered first, and decrease, when entered second, is not. In Equation (2), decrease is significant when it is entered first, but peak contributes significant predictive power even when it is entered in the second block. Thus, these results favor peak over decrease.

The results of the final comparison between fear increase and fear decrease are given in the lower part of the table. The pattern of results is identical with those in the previous comparison. The results favor increase over decrease.

In sum, these results suggested support for H4 (i.e., for increase) and H5 (i.e., peak fear). Both indices of fear predicted persuasion, but it proved impossible to discriminate between them in these data. Despite a significant bivariate relationship between fear decrease and persuasion (see Table 1 earlier), H6 was rejected on the grounds that fear decrease contributed no unique information to the regression in any of the comparisons.

DISCUSSION

Reactivity and Fear Arousal

The results showed that the tonic activation level of the behavioral inhibition system was correlated with fear arousal in ways that were largely, though not wholly, anticipated. In line H1 and H2, scores on the BIS showed significant positive associations with premessage fear, fear increase, and peak fear. These results are compatible with a conception of the BIS as a neurobiological system that varies across persons in sensitivity to aversive stimuli (Davidson, 1993; Depue & Collins, 1999; Gray, 1990).

For fear decrease, the result for BIS departed from expectation. Once fear was aroused, we expected that persons who are chronic inhibitors would continue to experience fear more intensely than individuals who are not, because their inhibition should dissipate less quickly. Thus, H2 also anticipated a negative relationship between BIS and fear decrease. In hindsight, the positive correlation is consistent with an emotional lability interpretation of BIS whereby the neuroticism tendency of high-BIS individuals may render them more sensitive to *changes* in threatening stimulation (see Eysenck, 1987).

If the behavioral activation system is the source of positive emotion, then it should not register a negative emotion such as fear. This provided the basis for H3, which asserted that the BAS score and fear would be unrelated. Indeed, the data showed nonsignificant correlations between the BAS and all of the indices of fear. The lack of a relationship between BAS and negative emotion is compatible with a previous study of public service advertising, which found that BAS was unrelated to peak measures of anger, fear, sadness, and guilt but was positively and significantly related to happiness and contentment (Dillard & Peck, 2001). The current findings contribute to the growing body of theory and data that distinguish the inhibition and activation systems in terms of their capacity to produce negative and positive affect, respectively.

Increase, Peak, Decrease, and Persuasion

All three dynamic fear indices showed positive and significant bivariate associations with the measure of persuasion. However, a series of regression analyses that pitted one component of the fear response against another provided evidence that favored some indices over others. Both fear increase and peak fear appear to positively influence persuasion; the results show support for the theoretical positions that argue for increases in emotion as a determinant of persuasion (e.g., Carver & Scheier, 1999) and for those that contend that emotional intensity is a valid cause of change in opinions (e.g., Dillard & Peck, 2000, 2001; Nabi, 1999). But this conclusion must be qualified, in that it was not possible in these data to clearly discriminate the effects of fear increase and peak fear. It was argued earlier that the two measures should show some independence because not all m1 values would be zero—because of naturally occurring BIS arousal. This expectation proved true. On a scale that ranged from 0–4, the mean premessage fear score was 0.30, with a range of 0–3.67. However, the correlation between fear increase and peak fear was 0.87, a degree of collinearity that was simply too great to allow for regression analysis to distinguish the unique effects of the two variables. An avenue for future research would therefore be a study that manipulates premessage fear by exposing participants to frightening stimuli in advance of the appeal, as this would clarify the effect of a fear increase. However, this suggestion is not so straightforward as it might appear. Some existing research suggests that premessage fear may enhance the impact of a persuasive appeal to the extent that the premessage threat is pertinent to the topic of the message (Baron, Logan, Lilly, Inman, & Brennan, 1994; Gleicher & Petty, 1992). Other studies indicate that fear induced by concerns that are *irrelevant* to the message topic also enhances persuasion (Hendrick & Borden, 1970; Lundy, Simonson, & Landers, 1967; Sigall & Helmreich, 1969; Simonson & Lundy, 1967). A comprehensive test of the effects of fear increase would include fear inductions that are both relevant and irrelevant to the persuasive appeal. Such an experiment would not only help to resolve the ambiguity in the present study, but might aid in clarifying some of the conflicting findings in the literature.

It was further concluded from the regression analyses that fear decrease seems to have little, if any, impact on persuasion. This finding runs counter to fear-drive theory, which claims that it is fear *reduction* that brings about agreement with an advocacy (e.g., Hovland, Janis, & Kelly, 1953).

Most research on persuasion and affect treats the message as if it were one indivisible unit. Such an approach may be warranted in many instances. But evaluating the message as a whole obscures the fact that persuasive advocacies are constructed from a variety of components and that each of these components might have a unique impact on emotion. In the current investigation, measurement of affect prior to the message, after the threat component, and again after the recommendations component permitted the creation or indices of fear increase, peak fear, and fear decrease. However, one risk inherent in designs of this sort is that the act of successive measurement may itself influence the outcome of the investigation. Happily, the data showed no effect of measurement on any of the variables assessed in this study. Whether or not message-component designs are uniformly nonreactive is a topic for future research.

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