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COGNITIVE THEORIES OF HUMAN FEAR: AN EMPIRICALLY DERIVED INTEGRATION

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University of Connecticut

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The predictions of four cognitive theories of fear and avoidance behavior were evaluated (Bandura, 1977, 1988; Beck, 1976; Beck & Clark, 1988; Beck & Emery, 1985; Kirsch, 1985, 1990; Reiss & McNally, 1985; Reiss, Peterson & Gursky, 1987). Ninety-four snake fearful subjects completed measures of danger expectancy, danger sensitivity, anxiety expectancy, anxiety sensitivity, fear tolerance, and self-efficacy. Half of the subjects received a motivational incentive to increase their performance. They were then asked to attempt tasks on a snake approach hierarchy and to rate the amount of fear they experienced during each step. The incentive significantly increased self-efficacy and approach behavior but did not alter anxiety expectancy or self-reported fear. A path analysis indicated that behavior was influenced by self-efficacy and fear tolerance, and fear was predicted by anxiety expectancy. Self-efficacy was predicted by anxiety expectancy and fear tolerance, and anxiety expectancy was predicted by danger expectancy. These data are interpreted as support for Kirsch’s (1990) model of the relation between self-efficacy and anxiety expectancy as determinants of fear and avoidance.

KEY WORDS: Expectancy, fear, self-efficacy

Phobias (APA, 1987) are characterized by the avoidance of feared objects and situations and by the experience of extreme anxiety when confrontations cannot be avoided. Fear is considered normal when it is proportionate to the level of danger inherent in a situation and phobic when the level of fear experienced is unreasonable given the danger posed by a stimulus. Current cognitive theories focus on expected outcomes as central to the prediction of fear and avoidance.

Beck and his colleagues (Beck, 1976; Beck & Clark, 1988; Beck & Emery, 1985) proposed that expected harm is the central determinant of anxiety and fear. In Beck’s theory, phobic anxiety is produced by irrational expectations of dangerous consequences. They further hypothesize that the phobic’s perceptions of danger become irrationally high with increasing proximity to the stimulus. A snake phobic who is asked to rate the danger involved in picking up a boa constrictor may state that the task is harmless when the snake is across the room in a cage, but may perceive much greater danger when asked the same question while standing next to the snake.

Beck’s explanation of increased danger expectancy as the primary determinant of phobics’ behavior seems limited because the decision to avoid the feared stimulus typically begins long before phobics are near it (Williams & Watson, 1985).
Nevertheless, studies with height and driving phobics have provided partial support for Beck’s theory. Danger expectancy was significantly correlated with avoidance, and ratings of expected danger obtained during a behavioral approach test were greater than those obtained prior to the test (Williams, Turner, & Peer, 1985; Williams & Watson, 1985).

Kirsch (1985) focused on the role of anxiety expectancy as a determinant of phobic anxiety and avoidance. Although normal levels of fear are produced by danger expectancies, phobics expect to experience fear in situations that they recognize as not particularly dangerous. According to Kirsch, the expectancy of anxiety leads people to avoid the situations in which they anticipate its occurrence. When unable to avoid the situation, their anxiety expectancies generate the experience of fear in the same way that placebo-induced expectancies generate expected responses.

Reiss and his colleagues (Reiss & McNally, 1985; Reiss, Peterson, & Gursky, 1987) have proposed an expectancy model of fear that includes both danger expectancy and anxiety expectancy. To these, they add two personality variables, danger sensitivity and anxiety sensitivity, as predictors of avoidance. Anxiety sensitivity is defined as the degree to which one experiences anxiety as aversive and danger sensitivity is defined as the degree to which one experiences danger as aversive. Expressed mathematically, their model is as follows: Fear behavior = (Danger Expectancy × Danger Sensitivity) + (Anxiety Expectancy × Anxiety Sensitivity).

Reiss, Epstein, and Gursky developed a scale to measure the construct of anxiety sensitivity, the Anxiety Sensitivity Index (Reiss, Peterson, Gursky, & McNally, 1986), and subsequent validity studies have confirmed that it is related to subjects’ reports of fearfulness (McNally & Lorenz, 1987; Reiss, Peterson, & Gursky, 1988). Craske, Rapee, and Barlow (1988) measured a similar construct, fear tolerance, using a one-question measure and found that it significantly predicted the approach/avoidance behavior of agoraphobics. This study uses Reiss et al.’s measure of anxiety sensitivity and Craske et al.’s measure of fear tolerance in order to evaluate their similarity and to compare their predictive power.

Bandura (1977) claimed that phobics’ anxiety and behavior are best predicted by their beliefs about their ability to cope with the phobic situation. Feelings of inefficacy result in fear and avoidance while expectations for maintaining control of the situation do not. Several empirical studies have confirmed that changes in self-efficacy are strongly related to changes in approach behavior, expected anxiety, and performance fear (Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980; Biran & Wilson, 1981).

However, tests of self-efficacy have not assessed the perceived coping abilities specified by the theory. Instead, self-efficacy is measured by questionnaires on which subjects are asked to indicate the number of tasks on a behavioral approach test they will be able to complete. Kirsch (1982; 1990) has argued that these questionnaires can be interpreted as measures of intention. As such, they should be determined by outcome expectancies (including danger expectancy and anxiety expectancy) and the subjective values of the expected outcomes (Rotter, 1954; Ajzen & Fishbein, 1980).

The Relation Between Self-Efficacy and Anxiety Expectancy

In attempting to clarify the relationship between anxiety expectancy and self-efficacy, several studies (Kirsch, Tennen, Wickless, Saccone, & Cody, 1983;
Williams et al., 1985; Williams, Doosman, & Kleinfield, 1984; Williams & Rappoport, 1983) have evaluated the impact of self-efficacy and anxiety expectancy on phobic subjects' experienced fear and avoidance behavior. Ratings of self-efficacy and anxiety expectancy were strongly related in these studies, with correlations generally ranging from -.70 to -.90. In these studies, both self-efficacy and expected anxiety were significant predictors of subjective fear and avoidance. In most instances, anxiety expectancy was the most powerful predictor of reported fear and self-efficacy was the most powerful predictor of approach behavior. In light of the research on the effects of self-efficacy, anxiety expectancy, and other outcome expectancies, Kirsch (1990) has proposed the model of fear and avoidance displayed in Figure 1.

According to this model, self-efficacy for approaching a feared stimulus (which is interpreted as a statement of intended behavior) is an immediate determinant of approach behavior, and anxiety expectancy is an immediate determinant of fear. Consistent with the theory of reasoned action (Ajzen & Fishbein, 1980), self-efficacy is determined by outcome expectancies, including the expectancy of anxiety (Kirsch, 1985, 1990).

This study included the central variables from the four cognitive theories of human fear described above and evaluated their ability to predict avoidance and fear. Danger expectancy was measured at two distances from the stimulus in order to test Beck's prediction that expected danger increases at the person approaches the feared stimulus. To test Kirsch's (1990) hypothesis that self-efficacy for approaching a feared stimulus is a statement of intention rather than an evaluation of perceived ability, a verbal inducement, aimed at maximizing the motivation for approach, was provided to half the subjects. We predicted that the verbal exhortation would increase self-efficacy and result in closer approach, without affecting expected anxiety or experienced fear.

METHOD

Subjects

Ninety-four students enrolled in Introductory Psychology classes at the University
of Connecticut participated voluntarily to satisfy course requirements. Only subjects who indicated “very much” fear or “terror” of snakes on a preliminary fear survey were asked to participate. The study was not limited to phobic subjects, because it was designed to test more general models of human fear, which can account for a wider range of fear and avoidance.

Procedure

During a classroom period prior to participating in the study, potential subjects completed a 13-item version of the Fear Survey Schedule-II (Geer, 1965), which included the items comprising the Injury Sensitivity Index, the fear of snakes item, and filler items referring to other common fears (Spiders, Rats and mice, Stinging insects). During the experimental session, subjects first completed the Reiss-Epstein-Gursky Anxiety Sensitivity Index (ASI, Reiss et al., 1986). They were then taken into a room containing a 3.5 foot long Beard’s rat snake in a covered glass cage, and allowed to look at it momentarily.

Half of the subjects were then given a verbal incentive to maximize their performance on the Behavioral Approach Test (BAT). Subjects in the control condition received neutral information stating that it was important to obtain the most accurate ratings of fear possible during their performance. Measures of danger expectancy, anxiety expectancy, fear tolerance, and self-efficacy were then administered.

Subjects then returned to the room containing the snake and were asked to perform each item on a Behavioral Approach Test (BAT), which consisted of 18 tasks that ranged in aversiveness from viewing the snake at a distance to tolerating the snake on one’s lap. Just prior to the performance of each step, subjects were asked to rate the amount of danger they expected on a ten-point scale. Following each step, they used a similar ten-point scale to rate the fear they had experienced while performing it. The performance test was terminated at the first step on the hierarchy that the subject failed to complete, after a rating of expected danger for the first failed step had been collected.

Measures

Danger Sensitivity. The Injury Sensitivity Index (ISI; Reiss et al., 1988) is a measure of danger sensitivity. It consists of items from the fear of injury/illness/death factor of the Fear Survey Schedule-II (Suffocating, Being in a fight, Being in an auto accident, Illness, Injury, Death, Untimely or early death, Illness or injury of a loved one, Death of a loved one; Bernstein & Allen, 1969).

Anxiety Sensitivity. The Reiss-Epstein-Gursky Anxiety Sensitivity Index (ASI; Reiss et al., 1986) is composed of items that assess reactions to the negative consequences of the experience of anxiety (e.g., illness, embarrassment).

Danger Expectancy. This measure consisted of ten-point scales, in which one represented no danger and ten represented extreme danger. Subjects used these scales to rate the amount of danger they expected when performing each step of an 18-item snake Behavioral Approach Test (BAT). Scores on the danger expectancy scales were summed, to indicate the amount of danger that subjects expected to experience if they completed the entire hierarchy.

Danger Expectancy Change Scores. A second set of danger expectancy ratings
were taken during completion of the BAT. Prior to each task on the BAT, subjects were asked once again to rate the amount of danger that task entailed. From the sum of these ratings, the sum of corresponding danger expectancy ratings made prior to beginning the BAT was subtracted, and the remainder was divided by the number of BAT steps completed plus one (i.e., the number of BAT steps for which two danger expectancy ratings were available). This constituted subjects' danger expectancy change scores.

**Anxiety Expectancy.** The Anxiety Expectancy Scale (Kirsch et al., 1983) is similar in construction to the danger expectancy scale and was used for rating the level of fear (from none to extreme fear) that subjects expected to experience during each step of the BAT. Anxiety expectancy was calculated as the sum of the anxiety ratings for the 18 tasks on the BAT, thus indicating the amount of anxiety that subjects expected to experience if they completed the entire hierarchy.

**Fear Tolerance.** Subjects were asked to use a ten-point scale to rate the maximum amount of fear (from none to extreme fear) they thought they would be able to tolerate before asking to leave the situation.

**Self-efficacy.** The self-efficacy scale was that used in previous studies of fear of snakes (Bandura et al., 1977; Bandura, Reese, & Adams, 1982; Kirsch et al., 1983). Subjects were asked to indicate, for each step on the behavioral approach test (BAT), whether or not they would be able to complete the task. For each step that they said they would be able to complete, subjects rated their confidence in this ability by stating a percentage from 10 percent to 100 percent confidence. Self-efficacy level was calculated as the total number of performance tasks labeled "can do". Self-efficacy strength was calculated as the mean of subjects' confidence ratings of their ability to accomplish the tasks.

**Behavioral Approach.** Approach behavior was represented by the number of steps completed on the BAT.

**Experienced Fear.** Following the completion of each step on the BAT, subjects were asked to rate the amount of fear they had experienced (from none to extreme) on ten-point scales. From these ratings, two measures were created: (a) mean fear across the ratings given and (b) initial fear, which was the sum of the ratings for the first six steps on the hierarchy. Four subjects do not have initial fear scores, because they completed fewer than six steps.

**RESULTS**

**Effects of Incentive**

Means and standard deviations of subjects’ expectancies, self-reported fear levels, and behavioral approach are presented in Table 1. Differences in these scores as a function of experimental condition were analyzed by independent t tests. As predicted, the verbal exhortation stressing the importance of maximizing subjects’ approach significantly enhanced self-efficacy strength and approach behavior, but did not significantly affect expected danger, expected anxiety, or experienced fear. It should be noted, however, that the effect of verbal incentive on initial fear levels closely approached significance, suggesting that it may be premature to rule out a relation between these variables.
Table 1 Means, Standard Deviations, and Between-Group t Tests on Expectancy, Fear, and Approach Behavior

<table>
<thead>
<tr>
<th>Variable</th>
<th>Incentive (n=47)</th>
<th>Control (n=47)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger Expectancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>90.98</td>
<td>92.26</td>
<td>0.17</td>
<td>ns</td>
</tr>
<tr>
<td>SD</td>
<td>36.15</td>
<td>38.70</td>
<td></td>
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<tr>
<td>Anxiety Expectancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>106.17</td>
<td>112.98</td>
<td>1.07</td>
<td>ns</td>
</tr>
<tr>
<td>SD</td>
<td>31.55</td>
<td>30.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear Tolerance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>7.51</td>
<td>6.93</td>
<td>-1.76</td>
<td>&lt;.08</td>
</tr>
<tr>
<td>SD</td>
<td>1.68</td>
<td>1.35</td>
<td></td>
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<tr>
<td>Self-Efficacy Level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>12.66</td>
<td>11.06</td>
<td>-1.88</td>
<td>&lt;.06</td>
</tr>
<tr>
<td>SD</td>
<td>4.14</td>
<td>4.11</td>
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<td></td>
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<tr>
<td>Self-Efficacy Confidence</td>
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</tr>
<tr>
<td>Mean</td>
<td>49.67</td>
<td>41.87</td>
<td>-1.97</td>
<td>&lt;.05</td>
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<tr>
<td>SD</td>
<td>20.46</td>
<td>17.90</td>
<td></td>
<td></td>
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<tr>
<td>Danger Expectancy Change</td>
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<td></td>
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</tr>
<tr>
<td>Mean</td>
<td>-0.97</td>
<td>-0.65</td>
<td>1.06</td>
<td>ns</td>
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<tr>
<td>SD</td>
<td>1.59</td>
<td>1.27</td>
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<td>Behavioral Approach</td>
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<tr>
<td>Mean</td>
<td>12.13</td>
<td>10.17</td>
<td>-2.74</td>
<td>&lt;.01</td>
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<td>SD</td>
<td>3.19</td>
<td>3.71</td>
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<td>Initial Fear</td>
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<td></td>
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<tr>
<td>Mean</td>
<td>10.17</td>
<td>14.89</td>
<td>1.77</td>
<td>&lt;.08</td>
</tr>
<tr>
<td>SD</td>
<td>10.20</td>
<td>14.60</td>
<td></td>
<td></td>
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<tr>
<td>Mean Fear</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>3.57</td>
<td>4.01</td>
<td>1.05</td>
<td>ns</td>
</tr>
<tr>
<td>SD</td>
<td>1.79</td>
<td>2.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Correlational Analyses

Correlations between all variables, along with their levels of significance, are presented in Table 2. Though significantly correlated with each other, neither danger sensitivity nor anxiety sensitivity were significantly correlated with any of the other variables in this study. Danger expectancy, anxiety expectancy, and self-efficacy were highly correlated with each other and were also associated with subsequent fear and behavior. Approach behavior was also significantly related to
fear tolerance, changes in expected danger, and initial fear level. Fear was associated with changes in danger expectancy, but not with individual differences in fear tolerance. Self-efficacy level and strength confidence were both highly correlated with anxiety expectancy. These correlations are similar in magnitude to pretreatment correlations reported in previous studies (Kirsch et al., 1983; Williams et al., 1984; Williams et al., 1985) and indicate a large amount of overlapping variance for self-efficacy and anxiety expectancy.

Table 2 Correlations Between Measures of Sensitivity, Expectancy, Fear, and Avoidance

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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</thead>
<tbody>
<tr>
<td>Danger Sensitivity</td>
<td>.33**</td>
<td>.01</td>
<td>-.10</td>
<td>.04</td>
<td>-.13</td>
<td>-.15</td>
<td>-.05</td>
<td>-.11</td>
<td>-.07</td>
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<tr>
<td>Anxiety Sensitivity</td>
<td>.14</td>
<td>-.08</td>
<td>.16</td>
<td>.08</td>
<td>-.14</td>
<td>-.14</td>
<td>.05</td>
<td>.09</td>
<td>-.03</td>
<td></td>
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<tr>
<td>Danger Expectancy</td>
<td>-.28***</td>
<td>.71**</td>
<td>.04</td>
<td>-.41**</td>
<td>-.48**</td>
<td>.34**</td>
<td>.27**</td>
<td>-.38**</td>
<td></td>
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<tr>
<td>Anxiety Expectancy</td>
<td>.05</td>
<td>-.27**</td>
<td>-.14</td>
<td>-.15</td>
<td>.34**</td>
<td>.37**</td>
<td>-.23*</td>
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<tr>
<td>Danger Expectancy</td>
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<tr>
<td>Fear Tolerance</td>
<td></td>
<td>.42**</td>
<td>.39**</td>
<td>.00</td>
<td>.01</td>
<td>.39**</td>
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<tr>
<td>Self-Efficacy Level</td>
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<td>.89**</td>
<td>-.31**</td>
<td>-.13</td>
<td>.79**</td>
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<td>Self-Efficacy</td>
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<td>Strength</td>
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<td></td>
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<td>.80**</td>
<td>.43**</td>
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<tr>
<td>Initial Fear</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>.90**</td>
<td>-.43**</td>
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<td>Mean Fear</td>
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<td></td>
<td>-.12</td>
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<td>Behavior</td>
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Moderating Effects of Anxiety Sensitivity and Danger Sensitivity

Theoretically, danger sensitivity and anxiety sensitivity should act as moderator variables affecting the magnitude of the association of danger expectancy and anxiety expectancy with fear and avoidance. Specifically, anxiety expectancy should have a greater impact on fear and avoidance among people who are particularly sensitive to anxiety, and danger expectancy should have a greater impact on fear and avoidance among people who are more sensitive to the possibility of harm (Reiss & McNally, 1985; Reiss et al., 1987). These predictions were tested by hierarchical regression analyses in which the main effects for sensitivity and expectancy measures were entered first, followed by the interaction of the two predictor variables (cf. Cohen & Cohen, 1975). These analyses yielded a significant interaction between danger sensitivity and danger expectancy as predictors of initial fear level, $F (1,93) = 6.54, p < .02$, and a marginally significant interaction of these variables as predictors of average fear, $F (1,93) = 3.76, p < .06$. None of the other interactions approached conventional levels of significance.

In order to determine the nature of these interactions, partial regression coefficients of the relation between danger expectancy and the criterion variables
were calculated at the mean and at one standard deviation above and below the mean danger sensitivity score (Jaccard, Turrisi, & Wan, 1990). These coefficients were then standardized by multiplying each estimate by the standard deviation of the predictor divided by the standard deviation of the criterion (Cohen & Cohen, 1975). The resulting beta coefficients are presented in Table 3. They indicate that the higher the subjects' danger sensitivity scores, the smaller the relationship between expected danger and experienced fear. These results are directly opposite to those predicted by Reiss's expectancy theory of fear.

Table 3 Expected Danger as a Predictor of Initial Fear and Mean Fear for Subjects With Low, Medium, and High Danger Sensitivity Scores

<table>
<thead>
<tr>
<th>Danger Sensitivity</th>
<th>Initial Fear</th>
<th>Mean Fear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>.43</td>
<td>.33</td>
</tr>
<tr>
<td>Medium</td>
<td>.36</td>
<td>.28</td>
</tr>
<tr>
<td>High</td>
<td>.28</td>
<td>.22</td>
</tr>
</tbody>
</table>

Changes in Danger Expectancy

In interpreting the significant correlations between danger expectancy change and behavioral approach and reported fear, it is important to consider the mean value of the change in danger expectancy. Inspection of Table 1 reveals that subjects in both conditions expected less harm when actually confronting the snake than they had prior to beginning the BAT. The grand mean for danger expectancy change was -.81, indicating that subjects' ratings of expected danger were lower when made in the situation with the snake than they had been on the initial questionnaire. The t test for the difference between the grand mean and zero was significant, \( t = -5.46, p < .001 \). This result is contrary to Beck's hypothesis that expected danger increases with closer approach to the feared object. Thus, rather than being predicted by a greater increase in anticipated harm, the correlations indicate that fear and avoidance are associated with smaller decreases in expected danger.

Beck's theory about changes in expected danger is specifically addressed to phobic anxiety, and this study was not limited to subjects whose fear of snakes could be diagnosed phobic. To determine if the predicted change in expected danger could be observed in more fearful subjects, the sample was divided into two groups based on initial responses to the snake fear item of the modified Fear Survey Schedule that was administered at the beginning of the study. A t test failed to reveal a significant difference in danger expectancy change between those who had reported "very much" fear of snakes (\( M = -0.91, \text{s.d.} = 1.26 \)) and those who had reported "terror" (\( M = -.66, \text{s.d.} = 1.67 \)), \( t = 0.67, p > .41 \). Both groups reported less expected danger during the approach test than they had when contemplating the approach test.
Evaluation of the Hypothesized Causal Model

Correlational data generally do not permit causal inferences; however, causal modeling (Kenny, 1979) may be used to test hypothesized causal relations among correlated data. Figure 2 presents an a priori causal model that is based on the four cognitive theories of human fear evaluated in this study. A saturated model was tested, except that, because of overlap in the item content of the two variables, initial fear was not included in the regression equation for predicting average fear. Only the statistically significant paths have been left in the diagram.

The path coefficients indicate that behavior was strongly influenced by self-efficacy. However, self-efficacy was not the only direct predictor of approach. Fear tolerance and initial fear added to the prediction of behavior even with variance associated with self-efficacy and other variables partialed out. Besides influencing approach behavior directly, fear tolerance indirectly affected behavior via its effect of self-efficacy. The effect of anxiety expectancy on behavior was also mediated by self-efficacy and was in turn greatly affected by danger expectancy.

![Figure 2 Path analysis of cognitive determinants of fear and avoidance.](image)

Subjects' initial danger expectancy directly influenced danger expectancy change. Subjects with higher initial levels of expected danger showed a greater reduction of expected danger than those with lower initial levels. Danger expectancy substantially influenced average fear such that decreases in danger expectancy were associated with lower levels of fear. Anxiety expectancy was a robust predictor of both initial fear and average fear, even with effects associated with all
other hypothesized mediating variables partialed out. With other variables held constant, self-efficacy and fear tolerance were unrelated to self-reported fear. Danger expectancy was related to experienced fear only indirectly through its effects on anxiety expectancy and changes in expected danger.

DISCUSSION

The integrated model of fear and avoidance evaluated in this study combines elements from each of four cognitive theories. Kirsch’s theory of anxiety expectancy was largely supported. Anxiety expectancy was the primary determinant of reported fear. It also influenced self-efficacy which, in turn, determined behavior. Self-efficacy was the primary determinant of behavior, as predicted by Bandura, and mediated the effects of anxiety expectancy on behavior. Self-efficacy did not, however, exert any independent influence on the experience of fear.

These results are consistent with those of previous studies and provide support for Kirsch’s interpretation of the relationship between anxiety expectancy and self-efficacy. As predicted (Kirsch, 1990), the incentive that was used to create positive outcome expectancies led to increases in self-efficacy and behavioral performance. Subjects who were led to believe that completion of the behavioral tasks would help to reduce suffering of people with phobias and would increase their ability to deal with fearful situations had higher behavioral performances and greater confidence in their ability to complete the tasks. This finding indicates that the self-efficacy scale measures subjects’ willingness to approach the feared stimulus, rather than their perceived ability to do so.

Beck’s theory linking fear to expected danger was partially supported. Danger expectancy was significantly correlated with fear and avoidance. However, the path analysis failed to find a direct association between expected danger and either dependent variable. Instead, indirect paths were found, in which danger expectancy affected anxiety expectancy, which affected self-efficacy and fear, both of which had independent effects on approach behavior. Normally, this would be interpreted as indicating that the effects of danger expectancy are entirely mediated by anxiety expectancies. However, in this case an alternate interpretation seems warranted.

As noted in the introduction, anticipations of harm would logically lead one to expect to experience anxiety, but the consequent fear and avoidance would be due to the expected harm rather than the expected fear. A person would fear and avoid an airplane flight that was expected to be bombed by terrorists. That person would also expect to feel extreme fear if he or she went on that flight. Nevertheless, it is the perception of the threat, rather than the expectation of the fear, that leads the person to avoid the flight and to experience fear if it cannot be avoided. For this reason, we believe the degree of fear and avoidance that is predicted by the variance shared by danger expectancy and anxiety expectancy should be attributed to the effects of danger expectancy, with that portion of the variance in anxiety expectancy interpreted as epiphenomenal. Conversely, associations between anxiety expectancy and other variables with the variance shared with danger expectancy statistically removed lend strong support to the hypothesized causal effects of anxiety expectancy. The path model demonstrates that these effects are quite substantial. Among college students reporting a fear of snakes, anxiety expectancy uniquely accounted for 36% of the variance of self-efficacy, 37% of the
variance in initial fear, and 30% of the variance in average fear. These data provide strong support for Kirsch's response expectancy hypothesis.

Beck and Emery's (1985) hypothesis that danger expectancy increases with closer approach to feared stimuli was not supported. Subjects were exposed to the snake before they made their initial ratings of expected danger, in order to gain a better understanding of the nature of the stimulus and the task required. Despite their previous exposure, they perceived the snake as less threatening upon closer approach. One possible explanation is that the snake was more docile, moving less than subjects had assumed based on their brief exposure. Changes in expectancies for danger from a feared object may, therefore, result from unanticipated differences in the stimulus rather than from increased proximity to it. Subjects whose ratings of danger expectancy did not decrease with greater exposure to the snake also reported experiencing greater fear. This finding supports the above interpretation that danger expectancy is an important determinant of reported fear. Those people whose perceptions of danger decreased with greater exposure to the snake were less fearful, while those whose expectancy for danger remained high experienced more anxiety.

The findings that both danger expectancy and anxiety expectancy significantly predicted fear and avoidance is consistent with the expectancy model developed by Reiss and his colleagues (Reiss & McNally, 1985; Reiss et al., 1987). Contrary to that model, however, anxiety sensitivity and danger sensitivity did not moderate the effects of the expectancy variables on avoidance behavior, nor did they predict fear or avoidance directly. The only effects were for danger sensitivity moderating the relationship of danger expectancy with average fear and initial fear. In each case the effect was in the direction contrary to that proposed by the model. Higher levels of danger sensitivity were associated with smaller relationships between danger expectancy and experienced fear.

One explanation of these results may be the questionnaires used to measure danger sensitivity and anxiety sensitivity. The validity of the danger sensitivity scale has not been adequately studied, and in assessing the face validity of the items, they appear to measure fear of death or injury rather than sensitivity to danger in general. The content is quite narrow, and a broader, better validated measure of danger sensitivity might reveal relationships with danger sensitivity and behavior.

Reiss et al.'s (1986) measure for anxiety sensitivity questions people's reactions to the negative consequences of anxiety, such as illness and loss of control. Previous results demonstrating a significant relationship between anxiety sensitivity and fearfulness (McNally & Lorenz, 1987; Reiss et al., 1987; Reiss et al., 1988) were not confirmed by this study. Fearfulness was measured differently in this study than in others using the anxiety sensitivity scale. Previous studies measured degrees of fearfulness of a broad range of objects and situations found on fear survey schedules. We measured reported fear for various tasks in one specific fear-inducing situation. Perhaps anxiety sensitivity is a significant predictor of anxiety frequency but not of severity of anxiety in a specific situation.

While anxiety sensitivity was not related to approach behavior, Craske et al.'s (1988) measure of fear tolerance, which asks people to rate the amount of anxiety they are willing to endure before leaving the situation, was a strong determinant of behavior, adding to its prediction even with the variance associated with self-efficacy removed. Although they are conceptually related variables, anxiety sensitivity and fear tolerance were uncorrelated. One explanation is that the Anxiety Sensitivity Index measures general reactions to the negative consequences of
anxiety and is too broad to significantly predict fearfulness and behavior in one specific situation. In contrast, the fear tolerance measure asked people to indicate the degree of fear they would be able to tolerate in this particular situation. Perhaps the greater predictive power of this measure is due to its situational specificity.

Future research should extend this integrated model to phobic populations. Because phobics expect to experience such great anxiety when approaching the objects that they fear, stronger incentives would be required to increase their willingness to perform fear-inducing behaviors. We would expect danger expectancy to exert less influence on the avoidance behavior of phobic subjects because fear more greatly exceeds the objective danger of the situation. Conversely, anxiety expectancy should exert an even greater effect on the self-efficacy, fear, and behavior of severely phobic subjects.

References


**Author Notes**

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