

Risk Perception and Anxiety

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Cognitive approaches to psychopathology assert that an individual's feelings and behaviours are determined by the way they perceive and structure their experiences. Beck's (1976) cognitive model of anxiety proposes that pathological anxiety results from unrealistic perceptions of the danger inherent in a given situation. This elevated sense of danger is presumed to occur through one or more of the following cognitive errors: a) overestimating the probability (risk) of a dangerous event; b) overestimating the severity (threat) of a feared event; c) underestimating coping resources; or d) underestimating rescue factors. Studies of individuals with a range of anxiety disorders confirm the presence of threat and danger related cognitions. However, there is little empirical research to show that the cognitive errors described above are associated with anxiety. The results from two studies examining the role of risk and threat perception in anxiety are presented. Both studies used the Risk Perception Questionnaire (RPQ) to assess risk and threat perception of positive and negative life events and daily uplifts and stressors. In the first study university students and community residents completed the RPQ and the State Trait Anxiety Inventory (STAI). Correlations between the two measures showed increased anxiety was associated with decreased expectations of positive life events and daily uplifts and increased risk perception for negative life events and daily stressors. Increased threat scores (risk X cost) for negative life events and daily stressors were associated with increased anxiety in the community subjects. Mean scores on the four risk perception subscales and the two negative threat scales differed significantly between subjects with high and low levels of trait anxiety. In the second study, risk and threat perception scores for subjects with DSM-III-R anxiety disorders were compared with those of a non-anxious clinical sample and community subjects. Increased risk perception of negative life events differentiated the anxious from the community subjects (non-anxious clinical subjects showed a nonsignificant elevation on this scale). Threat ratings of negative life events

discriminated the two clinic groups from the community subjects. Increased risk perception for daily stressors was unique to the anxiety disordered group. Results from the second study suggest increased risk perception of daily stressors may be unique to individuals suffering from anxiety disorders, while increased risk and threat perception of negative life events may be associated with psychopathology generally. The implications of these findings for Beck's model are discussed.

Cognitive models of psychopathology have attracted a wide following in recent years. Although a number of different theories have been proposed all share the belief that cognitions (i.e., concepts, ideas, expectations etc) play a fundamental role in emotional arousal and dysfunction. According to cognitive theorists, an individual's feelings and behaviours are determined by the way they perceive and structure their experiences.

Within the field of anxiety, the most systematic and elaborated cognitive approach is probably that of Beck (1976; Beck & Emery, 1985), who argues that it is not events *per se*, but people's interpretations of those events, which produce negative emotions such as anxiety. The interpretations of relevance to anxiety relate to the perception of danger. According to Beck (1976) pathological anxiety is characterized by unrealistic (elevated) perceptions of the danger inherent in any given situation. These overestimates of danger are thought to occur through one or more of the following cognitive errors "(a) overestimating the probability (*risk*) of a feared event; (b) overestimating the severity (*threat*) of a feared event; (c) underestimating coping resources (what you can do about it); or (d) underestimating rescue factors (what other people can do to help you)." (Clark & Beck, 1988, p 363, italics added). Beck also proposes that once an individual has interpreted a situation as dangerous they selectively scan the environment for confirmatory evidence of that danger. In this way the danger or threat is exaggerated while safety cues are minimised or ignored (Clark & Beck, 1988).

A number of studies have demonstrated an increase in the prevalence of negative automatic thoughts, including danger related cognitions, in individuals suffering from a range of anxiety disorders. In their seminal paper on cognition and anxiety, Beck, Laude, and Bohnert (1974) reported that the cognitions of individuals with "anxiety neurosis" centered around the theme of personal danger. Criticised on methodological grounds, their findings have, nonetheless, been replicated with subjects suffering from generalized anxiety disorder (Hibbert, 1984; Kendall & Hollon, 1989; Parkinson & Rachman, 1981; Sewitch & Kirsch, 1984), simple phobias (Mizes, Landolf-Fritsche, & Grossman-McKee, 1987), social phobias (Lucock & Salkovskis, 1988), and panic attacks (Hibbert, 1984; Rachman, Levitt, & Lopatka, 1987). This increase in negative thinking is not limited to those with anxiety disorders, but has also been identified in normal individuals in anxiety provoking situations (Kent, 1985; Kent & Jambunatan, 1989; Mizes et al., 1987).

Information processing models from cognitive science have been used to directly test the hypothesis that anxious individuals selectively scan, or search, their environment for evidence of danger and threat. Using a range of paradigms including dichotic listening (Burgess et al., 1981), shadowing (Mathews & MacLeod, 1986), the stroop colour-naming task (Mathews & MacLeod, 1985), and a probe technique (MacLeod, Mathews, & Tata, 1986) researchers have demonstrated, cross modally, that anxious subjects consistently deploy attention towards threat-related stimuli. This attentional bias appears greatest when the threat stimuli are congruent with the subject's key concerns and worries (Mogg, Mathews, & Weinman, 1989).

Clearly the results from both the cognitive content and information processing studies offer support for Beck's cognitive model of anxiety. There are aspects of his theory, however, which require further empirical testing: namely, the existence of the cognitive errors proposed to elevate the individual's perceptions of danger. In this paper we are specifically concerned with the hypothesis that anxious individuals overestimate the probability and severity of feared (negative) events.

Research with community subjects has shown that most individuals believe positive events are likely to happen to them and negative events are not (Hoch, 1985). People typically rate positive events as *more* likely, and negative events as *less* likely, to happen to them than to others (DeJoy, 1989; Kirscht, Hafner, Kegeles, & Rosenstock, 1966; Perloff, 1983; Roberston, 1977; Weinstein, 1980, 1982, 1983, 1984, 1987). This self-other discrepancy in risk perception for negative events is interpreted as an error in judgement and labelled unrealistic optimism (Weinstein, 1980). The phenomenon appears to be highly consistent (DeJoy, 1989; Harris & Guten, 1979; Kirscht et al., 1966; Perloff, 1983; Roberston, 1977; Weinstein, 1980, 1982) and has been ascribed a number of adaptive functions including, enhancing self-esteem (Weinstein, 1982), promoting a sense of personal control (Janoff-Bulman, 1985; Perloff, 1983), and reducing anxiety (Kirscht et al., 1966; Perloff, 1983). Although these claims have yet to be empirically tested, there is some evidence that such positive 'illusions' are

adaptive for mental health (Taylor & Brown, 1988).

In contrast, the limited empirical research on risk and threat perception with clinical populations suggests mood disturbance is associated with increased risk perception and the absence of unrealistic optimism. Butler and Mathews (1983) had anxious, depressed, and control subjects rate the probability and cost of negative and positive events occurring to them relative to others. Both clinical groups rated the likelihood, and cost, of negative events higher than normals. The clinic subjects also differed from controls in estimating aversive events as more likely to occur to them than others (absence of unrealistic optimism). From these results, the authors concluded that anxiety inflated estimation of risk. While this may be true, elevated risk perception was also observed in the depressed subjects, suggesting heightened risk perception is associated with disturbed mood generally, not just anxiety. More recent research with agoraphobic (McNally & Foa, 1987) and socially anxious (Lucock & Salkovskis, 1988) patients has identified increased risk perception in these groups. For both groups this appeared limited to negative events consistent with the source of the subjects' anxiety. Unfortunately, neither study tested for the presence of unrealistic optimism by having subjects estimate their risk relative to others.

Research in this area has been hampered, however, by the lack of a standardized, validated, instrument for the assessment of risk and threat perception. Some researchers have developed their own measures (Dewberry, Ing, James, Nixon, & Richardson, 1990), but most have relied on the Subjective Probability Questionnaire (SPQ) (Butler & Mathews, 1983), or variations of it (Butler & Mathews, 1987; Lucock & Salkovskis, 1988; McNally & Foa, 1987). While failing to use an existing questionnaire makes it difficult to compare results across studies, the SPQ has a number of limitations: the comparison target figure and the time frame for predicting risk vary across items on the questionnaire, factors both likely to influence risk estimates (Perloff & Fetzer, 1986; Rachman & Birchard, 1988); the comprehensibility of the instructions and the ambiguity of some of the positive items have been questioned (Kent, 1985); Butler and Mathews (1983) provide no reliability or validity data for the measure, or give any details on how the items in the questionnaire were selected.

In an effort to overcome the limitations of the SPQ, and to facilitate research on the role of risk and threat perception in anxiety, we developed the Risk Perception Questionnaire (RPQ) (Tan, Milne, & Tripp, in progress). The RPQ has two subscales, a) Life Events and b) Daily Stressors and Uplifts. Both subscales include a range of positive and negative situations and subjects are required to rate their chances of encountering each event, relative to the average New Zealander of their age and sex, some time in the future (Life Events) or within the next month (Daily Stressors and Uplifts). Ratings are made on a seven step scale from "much below average" to "much above average". The steps on the scale are treated as equal interval and the responses scored from 1 to 7. A score of 4 corresponds to "average", indicating a subject perceives their risk of experiencing an event as equivalent to others of their age and sex. Respondents are also asked to rate the desirability/cost of each event on a

scale ranging from "very negative" to "very positive". These ratings are scored from -3 through 3, with zero as the neutral point. Threat scores are obtained by multiplying the risk estimate by the desirability/cost for each event.

The Life Events Scale was included in the RPQ as life events are thought to play an important role in the development of psychopathology in general (Holmes & Rahe, 1969; Sarason, Johnson, & Seigal, 1978) and anxiety specifically (Monroe & Wade, 1988). Research on the relationship between daily hassles and anxiety is limited, but suggests such minor nuisances may have more influence than life events (Bolger, DeLongis, Kessler, & Schilling, 1989). Daily stressors are distinguished from major life events by their higher potential for occurring on a daily basis, and their less severe individual impact on the subject. Positive, as well as negative, items are included on the RPQ in recognition of their association with positive affect, an equally important feature of daily life (Bolger et al., 1989; Clark & Watson, 1988; Stone, 1987; Watson, 1988). Use of a target comparison figure allows for the assessment of unrealistic optimism. Preliminary studies with the RPQ indicate it has good test-retest reliability and adequate validity. (Copies of the RPQ and the revised RPQ-R, together with preliminary reliability and validity data may be obtained from the first author.)

To date the RPQ has been used in two studies to test the hypothesis that anxiety is associated with elevations in risk and threat perception. Both studies are described briefly below and their results discussed with reference to Beck's cognitive model of anxiety and Kendall and Ingram's (1989) Component Model of Psychopathology.

Study 1 assessed risk perception, threat perception, and anxiety in two non clinical populations: university students and community residents. The student sample ($N=75$) were first year psychology students at the University of Otago. Community residents ($N=91$) were recruited through service organizations and from amongst the friends and acquaintances of the researchers using the "snowball" technique. All subjects completed the state-trait anxiety inventory (STAI) (Spielberger, 1983) and the RPQ.

Eight separate scores were derived from responses to the RPQ. Mean risk perception ratings and threat scores for the positive and negative items on the Life Events and Daily Stressors and Uplifts Scales. Raw scores from the state and trait scales of the STAI were converted to percentiles using the appropriate norms (Spielberger, 1983). These data are presented, separately for the two groups, in Table 1. Consistent with the findings of previous studies of risk estimation in non clinical samples, the risk perception scores for the two groups showed they rated their chances of experiencing positive events (life events and daily uplifts) as better than average. Conversely subjects in both groups rated negative life events as less likely to happen to them than others, suggesting the presence of unrealistic optimism. Risk ratings for daily stressors did not reflect the presence of unrealistic optimism. This last result is perhaps not surprising given the nature of these events. Daily stressors are, by definition (Lazarus, 1984), frequent events in people's lives and therefore more likely to be available in memory due to their recency and salience. Thus people may judge

Table 1: Mean risk perception, threat, and anxiety scores for the student and community groups.

	Student Sample		Community Residents	
	mean	(SD)	mean	(SD)
Risk Perception Ratings				
Positive life events	4.4	(0.8)	4.8	(0.8)
Negative life events	3.1	(0.6)	2.8	(0.7)
Daily uplifts	4.7	(0.7)	4.5	(0.7)
Daily stressors	4.4	(0.6)	3.9	(0.6)
Threat Scores				
Positive life events	10.6	(3.0)	9.9	(3.5)
Negative life events	-5.9	(1.7)	-5.3	(2.2)
Daily uplifts	9.3	(3.1)	-8.7	(3.1)
Daily stressors	-4.6	(2.0)	-4.2	(2.0)
Anxiety Ratings				
State scale	51.0	(26.4)	40.0	(25.0)
Trait scale	56.0	(28.4)	59.0	(27.0)

these events as more likely to happen to them.

The degree of linear association between anxiety and risk and threat perception was examined in the two groups by correlating the eight RPQ scores separately with both State and Trait anxiety scores. Given the number of correlations performed critical alpha was set at 0.01 to reduce the likelihood of type I errors while guarding against type II errors.

For both groups, state anxiety was significantly correlated with risk scores for daily uplifts ($r = -0.395, p < 0.0001$) and stressors ($r = 0.325, p < 0.002$). As levels of state anxiety increased perceived risk (chance) of experiencing daily uplifts decreased, while perceived risk of experiencing daily stressors increased. Correlations between trait anxiety and risk perception were significant for the four risk perception scores for the community subjects (positive life events $r = -0.335, p < 0.001$; negative life events $r = 0.388, p < 0.0001$; daily uplifts $r = -0.303, p < 0.002$; daily stressors $r = 0.524, p < 0.0001$), and for all but negative life events for the student sample (positive life events $r = -0.363, p < 0.001$; daily uplifts $r = -0.335, p < 0.002$; daily stressors $r = 0.512, p < 0.0001$). Increased trait anxiety was associated with decreases in perceived risk of experiencing positive life events and daily uplifts, and increased risk perception for daily stressors and negative life events (community residents only).

Overall these results are consistent with the prediction that anxiety is associated with overestimates of the probability of feared (negative) events. The moderate size of most of the correlations probably reflects the absence of very anxious subjects from the samples. The presence of significant correlations between trait, but not state, anxiety and risk perception for the life events scales is consistent with the nature of these two constructs. As the term suggests

state anxiety refers to a transient emotional state, more likely influenced by recent rather than distant events. Trait anxiety, on the other hand, is a more enduring characteristic, or response pattern, of the individual and as such might be expected to be more generally related to risk perception, irrespective of the nature of the event.

Threat scores were less systematically related to anxiety. Significant correlations were obtained between trait anxiety scores and threat scores for negative life events ($r = -0.383, p < 0.0001$) and daily stressors ($r = -0.620, p < 0.0001$) for the community residents only. For this group, as trait anxiety increased, negative events were perceived as more threatening.

While the above correlations demonstrate the presence of linear relationships between risk perception (and to a lesser extent threat scores) and anxiety, they do not indicate the extent to which risk and threat perception differ in anxious and non anxious individuals. Nor do they show how anxiety affects the phenomenon of unrealistic optimism. Therefore, in an exploratory analysis, the two groups were collapsed and risk and threat scores for subjects with high (75th percentile and above) and low (25th percentile and below) levels of state and trait anxiety were compared.

Mean risk and threat scores for the high and low anxious subjects are presented in table 2. Subjects reporting high levels of state ($N = 45$) or trait ($N = 56$) anxiety rated negative events, daily stressors (state: $t(72) = -4.11, p < 0.0002$; trait: $t(81) = -5.64, p < 0.0002$) and major life events (state: $t(72) = -2.56, p < 0.007$; trait: $t(81) = -2.82, p < 0.006$), as more likely to happen than did subjects with lower levels of anxiety (state $N=29$; trait $N=27$). Conversely positive events, both daily uplifts (state: $t(72) = 4.15, p < 0.0002$; trait: $t(81) = 2.8, p < 0.003$) and major life events (trait: $t(81) = 2.62, p < 0.005$), were rated as less likely to occur by the more anxious subjects. Inspection of the mean risk scores of the anxious subjects indicated the presence of unrealistic optimism for major life events but not daily stressors. Despite their elevated ratings on the negative life events scale the more anxious subjects still perceived their risk to be below average. This persistence of unrealistic optimism may, of course, reflect the non clinical

status of the anxious subjects in this study.

Similar comparisons with the threat scores showed subjects experiencing high levels of anxiety rated negative events, daily stressors (state: $t(72) = 3.34, p < 0.002$; trait: $t(81) = 6.10, p < 0.0002$) and negative life events (trait: $t(82) = 3.17, p < 0.002$) as more threatening than the less anxious subjects. In addition subjects with high state anxiety reported lower (less positive) threat scores for daily uplifts ($t(72) = 2.93, p < 0.004$) than the low state anxiety subjects.

The results of this second analysis, while open to criticism (e.g., non clinical population, arbitrary criteria for group assignment; unequal N), confirm suggestions that anxiety is associated with elevated risk perception (Clark & Beck, 1988). The data also indicate that negative events, including minor nuisances, are perceived as more threatening by anxious individuals. Missing from Beck's model, but suggested by the present data, is an accompanying lowering of expectations among anxious subjects that positive things will happen to them.

As the RPQ scores were known to correlate significantly with anxiety, contrasting the scores of the high and low anxious subjects maximised the likelihood that the two groups would differ. A more appropriate test of Beck's propositions would be to compare risk perception and threat scores in subjects with and without recognised anxiety disorders. As there is some evidence that elevated risk perception may be a more general marker of psychological distress (Butler & Mathews, 1983) such a study should also include a non anxious patient control group. Our second study with the RPQ compared the risk and threat scores of anxious and non anxious patient groups and a community

group of community subjects ($N=28$). Mean scores on the

Table 2: Mean risk perception and threat scores for high and low state- and trait-anxiety subjects

	Low Trait Anxiety mean (SD)	High Trait Anxiety mean (SD)	Low State Anxiety mean (SD)	High State Anxiety mean (SD)
Risk Perception Ratings				
Positive life events	4.66 (0.98)	4.17 (0.70)	4.83 (0.86)	4.39 (0.85)
Negative life events	2.69 (0.68)	3.16 (0.73)	2.73 (0.69)	3.16 (0.69)
Daily uplifts	4.79 (0.58)	4.35 (0.71)	4.91 (0.53)	4.26 (0.81)
Daily stressors	3.63 (0.49)	4.41 (0.64)	3.78 (0.62)	4.39 (0.62)
Threat Scores				
Positive life events	10.10 (4.27)	9.18 (3.37)	11.11 (3.54)	9.67 (3.67)
Negative life events	-4.40 (1.76)	-6.04 (2.37)	-4.87 (1.83)	-5.52 (2.32)
Daily uplifts	8.89 (3.12)	8.36 (3.00)	9.92 (3.17)	7.78 (2.86)
Daily stressors	-2.78 (1.16)	-5.40 (2.08)	-3.54 (1.78)	-5.01 (2.08)

Table 3: Mean risk perception and threat scores for the anxious, patient control and normal control groups

	Anxious <i>mean</i>	Patient <i>(SD)</i>	Patient Control <i>mean</i>	Patient Control <i>(SD)</i>	Normal Control <i>mean</i>	Normal Control <i>(SD)</i>
Risk Perception Ratings						
Positive life events	4.25	(0.82)	3.79	(1.22)	4.16	(0.89)
Negative life events	3.42	(0.91)	3.07	(0.90)	2.49	(0.65)
Daily uplifts	4.19	(0.63)	3.76	(0.78)	4.42	(0.66)
Daily stressors	4.44	(0.77)	3.83	(0.79)	3.81	(0.62)
Threat Scores						
Positive life events	8.78	(2.61)	3.83	(0.79)	8.49	(4.29)
Negative life events	-6.94	(2.44)	-5.70	(3.80)	-2.71	(3.20)
Daily uplifts	7.24	(3.65)	6.06	(4.11)	7.59	(3.44)
Daily stressors	-5.24	(4.25)	-4.34	(3.77)	-3.42	(2.83)

RPQ for the three groups are presented in table 3.

Analysis of variance (ANOVA) procedures were used to compare the three groups on each of the eight RPQ subscales. Despite the number of comparisons critical alpha was set at 0.05. Although this increases the chance of type I errors we did not want to risk rejecting real group differences as non significant. Three of the eight RPQ scores were found to differentiate the groups, risk perception scores for daily stressor $F(2,42) = 3.304, p < 0.05$, and risk perception $F(2,42) = 5.534, p < 0.007$ and threat $F(2,42) = 7.236, p < 0.002$ scores for negative life events. Post hoc comparisons were made with the Student Newman Keuls procedure. Risk perception scores for negative life events were significantly higher in the anxiety disordered clients than in the community subjects (the patient control group showed a nonsignificant elevation on this scale). Threat scores for negative life events were significantly higher in the two patient groups than in the community sample. Finally risk perception scores for daily stressors were significantly higher for the anxiety disordered group than for either of the other groups. Unrealistic optimism was present in all three groups for major life events, but not for daily stressors in the anxious patient group.

The presence of elevated risk perception and threat scores in the anxiety disordered group offers further support for Beck's suggestion that pathological anxiety is associated with an over estimation of the probability and severity of feared (negative) events. However, the observation that risk perception (although not significant) and threat scores for negative life events were elevated in the patient control group raises important questions about the specificity of this phenomenon to anxiety. These data suggest increased risk and threat perception for negative life events is associated with psychological distress generally, and not specific to anxiety disorders. This result is consistent with the earlier findings of Butler and Mathews (1983) who, while concluding that anxiety inflated risk perception, also reported that their depressed subjects rated the likelihood and cost of negative events higher than controls. At this

point it is also important to acknowledge that the STAI, used to measure anxiety in study 1, correlates more strongly with many depression scales than with other anxiety scales (Lovibond, personal communication, June 1995). Thus the correlations between STAI scores and risk and threat ratings in study 1 might be better interpreted as an association between emotional distress and elevated risk perception and threat scores.

In the present study only risk perception for daily stressors distinguished the two patient groups. This result suggests that overestimating the probability of common annoying events may be unique to the anxiety disorders. Although additional research is needed to confirm this finding, it suggests some modification of Beck's propositions may be in order. Overestimating the probability (risk) and severity (threat) of a feared event is associated with psychological distress. Increased risk perception for daily stressors appears specific to anxiety disorders. Interestingly, Franklin and Andrews (1989) have suggested that anxiety disorders develop as a result of long standing daily hassles.

Moving beyond Beck's model, a useful framework for interpreting the data from the current studies is Kendall and Ingram's (1989) Component Model of Psychopathology Elements. These researchers argue that expression of psychopathology is the outcome of "common psychopathological features", "critical psychopathological features", and "unpredictable error variance". Common features are general characteristics of all or most disorders and are conceptualized as common or shared psychopathological variance, they broadly separate adaptive from maladaptive functioning. Critical features are defined as features representing variance that is uniquely characteristic of a particular disorder and thus describe variables specific to a given psychopathology. In addition to differentiating disorder from non-disorder these critical features separate one disorder from another. Finally, error variance refers to factors unique to the individual which influence the precise symptoms and characteristics of the disorder.

In the terms of the Component Model, it is proposed that increased risk and threat perception for negative life events are common psychopathological features, i.e., common to most psychopathology. The critical feature for anxiety disorders appears to be increased risk perception for daily stressors - this was the only variable which differentiated the patient groups in study 2. Group analysis of the RPQ scores prevents us from drawing conclusions about the error variance in our sample. Whatever its nature, this error variance may well be responsible for determining which anxiety disorder(s) a patient suffers from. Figure 1 illustrates the proposed component model of anxiety disorders.

Summary

The data from studies 1 and 2 generally support the notion that elevated risk and threat perception are associated with, but not specific to, anxiety. Increased risk perception for daily stressors may, however, be a unique feature of anxiety disorders. Additional research, particularly with clinical populations, is obviously required to confirm these findings. If the present results can be replicated then some adjustment of Beck's cognitive model of anxiety may be appropriate.

Unrealistic optimism for negative life events proved to a highly robust phenomena, but did not serve to protect subjects from experiencing anxiety/emotional distress. Mean risk perception scores for negative life events were elevated amongst the anxious subjects (study 1 and 2), however these subjects still perceived their risk status as below average. Conversely, these same subjects rated their chances of experiencing daily stressors as higher than average. This latter finding adds weight to the importance of negative daily events in the development of anxiety.

Kendall and Ingram's (1989) Component Model of Psychopathology proved helpful in drawing together, making sense of, the current data set. It also highlighted the need for research on the specificity of elevated risk and threat perception to anxiety disorders.

Clearly the data raise a number of questions about the role of risk and threat perception in psychopathology. We believe the RPQ has a role to play in answering some of these questions and recently developed a short form of the measure (RPQ-Revised [RPQ-R]) in order to increase its utility as a research tool and a clinical instrument. The RPQ-R has good internal consistency and its factor structure mirrors that of the original RPQ. We are using the RPQ-R to collect data from clinically depressed and anxious populations to test the specificity of elevated risk and threat perception.

References

Beck, A., & Emery, G. (1985). *Anxiety Disorders and Phobias*. New York: Basic Books

Beck, A.T. (1976). *Cognitive Therapy and the Emotional Disorders*. New York: International Universities Press.

Beck, A.T., Laude, R., & Bohnert, M. (1974). Ideational components of anxiety neurosis. *Archives of General Psychiatry*, 31, 319-325.

Bolger, N., DeLongis, A., Kessler, R.C., & Schilling, E.A. (1989). Effects of Daily Stress on Negative Mood. *Journal of Personality and Social Psychology*, 57(5), 808-818.

Burgess, I.S., Jones, L.N., Robertson, S.A., Radcliffe, W.N., Emerson, E., Lawler, P., & Crowe, T.J. (1981). The degree of control exerted by phobic and non-phobic verbal stimuli over the recognition behaviour of phobic and non-phobic subjects. *Behaviour Research and Therapy*, 19, 233-234.

Butler, G., & Mathews, (1983). Cognitive processes in anxiety. *Advances in Behaviour Research Therapy*, 5, 51-69.

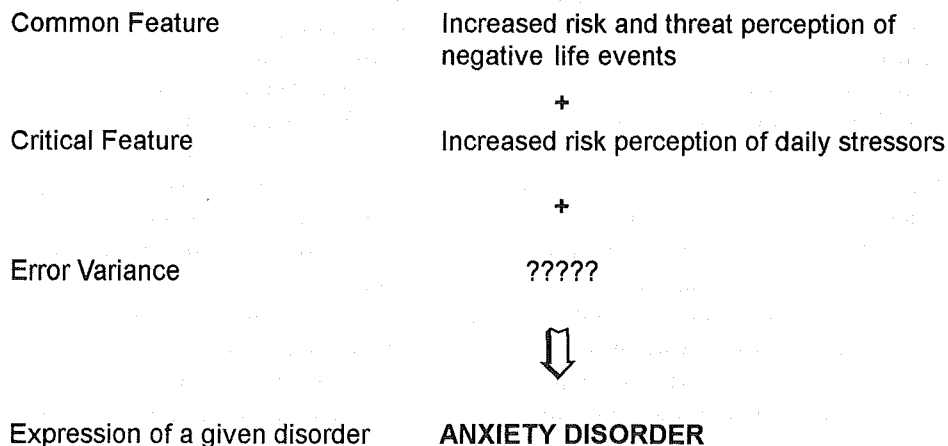
Butler, G., & Mathews, A. (1987). Anticipatory anxiety and risk perception. *Cognitive Therapy and Research*, 11(5), 551-565.

Clark, L.A., & Watson, (1988). Mood and mundane: Relations between daily life events and self-reported mood. *Journal of Personality and Social Psychology*, 54, 296-308.

Clark, D.M., & Beck, A.T. (1988). Cognitive approaches. In C. Last, & M. Hersen (Ed.), *Handbook of Anxiety Disorders* (pp. 369-385). New York: Pergamon.

Dejoy, D. M. (1989). The optimism bias and traffic accident risk

Figure 1: Component Model of Anxiety Disorders



- perception. *Accident Analysis and Prevention*, 21(4), 333-340.
- Dewberry, C., Ing, M., James, S., Nixon, M., & Richardson, S. (1990). Anxiety and Unrealistic Optimism. *Journal of Social Psychology*, 130(2), 151-156.
- Franklin, J.A., & Andrews, G. (1989). Stress and the onset of agoraphobia. *Australian Psychologist*, 24(9), 703-219.
- Harris, D.M., & Guten, S. (1979). Health protective behaviour: An exploratory study. *Journal of Health and Social Behaviour*, 20, 17-29.
- Hibbert, G.A. (1984). Ideational components of anxiety: their origin and content. *British Journal of Psychiatry* 144, 618-694.
- Hoch, S.J. (1985). Counterfactual reasoning and accuracy in predicting personal events. *Journal of Experimental Psychology Learning, Memory and Cognition*, 11(4), 719-731.
- Holmes, T.H., & Rahe, R.H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research*, 11, 213-218.
- Janoff-Bulman, R. (1985). Criminal vs non-criminal victimisation: Victims reaction. *Victimology. An International Journal*, 10, 498-511
- Kendall, P.C., & Hollon, S.D. (1989). Anxious self-talk: Development of the anxious self-statements questionnaire (ASSQ). *Cognitive Therapy and Research*, 13(1), 81-93.
- Kendall, P.C., & Ingram, R.E. (1989). Cognitive-behavioural perspectives: theory and research on depression and anxiety. In P.C. Kendall & D. Watson (eds) *Anxiety and Depression: Distinctive and Overlapping features*. New York: Academic Press Inc.
- Kent, G. (1985). Cognitive Processes in dental anxiety. *British Journal of Clinical Psychology*, 24(4), 259-264.
- Kent, G., & Jambunathan, P. (1989). A longitudinal study of the intrusiveness of cognitions in test anxiety. *Behaviour Research and Therapy*, 27(1), 43-50.
- Kirscht, J.P., Haefner, D.P., Kegeles, F.S., & Rosenstock, I.M. (1966). A national study of health beliefs. *Journal of Health and Human Behaviour*, 7, 248-954.
- Lazarus, R.S. (1984). Puzzles in the study of daily hassles. *Journal of Behavioural Medicine*, 7(4), 375-389.
- Lucock, N.P., & Salkovokis, P.M. (1988). Cognitive factors in social anxiety and its treatment. *Behaviour Research and Therapy*, 26(4), 297-302.
- MacLeod C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology*, 95(1), 15-20.
- Mathews, A., & MacLeod, C. (1985). Selective processing of threat cues in anxiety states. *Behavior Research and Therapy*, 23(5), 563-569.
- Mathews, A., & MacLeod, C. (1986). Discrimination of threat cues without awareness in anxiety states. *Journal of Abnormal Psychology*, 95(2), 131-138.
- McNally, R.J., & Foa, E.B. (1987). Cognition and agoraphobia: Bias in the interpretation of threat. *Cognitive Therapy and Research*, 11(5), 567-581.
- Mizes, J.S., Landlof-Fritsche, B., & Grossman-McKee, D. (1987). Patterns of distorted cognitions in phobic disorders: An investigation of clinically severe simple phobias, social phobias and agoraphobics. *Cognitive Therapy and Research*, 11(5), 583-592.
- Mogg, K., Mathews, A., & Weinman, I. (1989). Selective processing of threat cues in anxiety states: a replication. *Behaviour Research and Therapy*, 27(4), 317-323.
- Monroe, S.M., & Wade, S.L. (1988). Life Events In C.G. Last, & M. Hersen, (Ed.), *Handbook of Anxiety Disorders*. New York: Pergamon Press.
- Parkinson, L., & Rachman, S. (1981). Part II. The nature of intrusive thoughts. *Advances in Behaviour Research and Therapy*, 3, 101-110.
- Perloff, L.S. (1983). Perceptions of vulnerability to victimisation. *Journal of Social Issues*, 39(2), 41-61.
- Perloff, L.S., & Fetzer, B.K. (1986). Self-other judgements and perceived vulnerability to victimisation. *Journal of Personality and Social Psychology*, 50(3), 509-510.
- Rachman, S., & Bichard, S. (1988). The overprediction of fear. *Clinical Psychology Review*, 8, 303-312.
- Rachman, S & Levitt, K., & Lopatka, C. (1987). Panic: The links between cognitions and bodily symptoms - 1. *Behaviour Research and Therapy*, 25(5), 41-423.
- Robertson, L.S. (1977). Car crashes: Perceived vulnerability and willingness to pay for crash protection. *Journal of Community Health*, 3, 136-141.
- Sarason, I.G., Johnson, J.H., & Seigel, J.M. (1978). Assessing the impact of life changes: Development of the Life Experiences Survey. *Journal of Consulting and Clinical Psychology*, 46(5), 932-946.
- Sewitch, T.S., & Kirsch, I. (1984). The cognitive content of anxiety: naturalistic evidence for the predominance of threat related thoughts. *Cognitive Therapy and Research*, 8, 49-58.
- Spielberger, C.D. (1983). *Manual for the State-Trait Anxiety Inventory*. California: Consulting Psychologists Press, Inc.
- Stone, A.A. (1987). Event content in a daily survey is differentially associated with concurrent mood. *Journal of Personality and Social Psychology*, 52, 56-58.
- Tan, S., Milne, J., & Tripp, G. (In progress). *The development of the RPQ: A new instrument for the assessment of risk and threat perception*.
- Taylor, S.E., & Brown, J.D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103(2), 193-210.
- Watson, D. (1988). Individual and interindividual analyses of positive and negative affect: Their relationship to health complaints, perceived stress, and daily activities. *Journal of Personality and Social Psychology*, 54, 1020-1030.
- Weinstein, N.D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39(5), 806-820.
- Weinstein, N.D. (1982). Unrealistic optimism about susceptibility to health problems. *Journal of Behavioural Medicine* 5(4), 441-460.
- Weinstein, N.D. (1983). Reducing unrealistic optimism about illness susceptibility. *Health Psychology* 2(1), 11-90.
- Weinstein, N.D. (1984). Why it won't happen to me: Perceptions of risk factors and susceptibility. *Health Psychology*, 3(5), 431-457.
- Weinstein, N.D. (1987). Unrealistic Optimism about susceptibility to Health Problems: Conclusions from a community-wide sample. *Journal of Behavioural Medicine*, 10(5), 481-500.

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