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The Cognitive Side of Anxiety[1]

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Building from a differentiation of the dimensions of cognition (prepositions/content, operations, products, structures), a cognitive component model of anxiety is proposed and described. The model consists of the critical psychopathological features, common psychopathological features, and error variance. Cognitive distortions are differentiated from cognitive deficiencies. Specific critical features, such as schematic content and functioning, temporal distortions, and task-irrelevant thought, are described and are considered aspects of cognitive functioning relatively specific to anxiety. Common features, such as self-absorption, automatic processing, capacity limitations, and cognitive asymmetry, are also described but are considered aspects of dysfunctional cognition associated with anxiety as well as some other related psychopathologies. Questions requiring additional research are noted.

KEY WORDS: anxiety; cognitive distortions; cognitive schemata; cognition and psychopathology.

The pervasiveness of anxiety is evidenced by its heterogeneity. Social anxiety, test anxiety, generalized trait anxiety, state anxiety, performance anxiety, and speech anxiety are among the labels commonly employed to denote specific anxiety disorders. Anxiety also covaries with a multitude of other

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primary disorders, such as depression and personality disorders (DSM-III-R), and can thus be considered a secondary disorder as well. Moreover, anxiety is presumed to be the process underlying many diagnostic categories, including agoraphobia, panic disorder, phobic disorder, obsessive-compulsive disorder, and posttraumatic stress disorder. Anxiety is furthermore thought to be a contributing factor in physical disorders, such as hypertension, headaches, sexual dysfunction, and chronic pain. Indeed, anxiety is so prevalent that its experience is virtually commonplace in both normal and abnormal functioning. It is when this "common" phenomenon becomes excessive or protracted, when it becomes activated at the wrong time, or when it becomes transsituational, that it is considered dysfunctional.

Although anxiety has occupied a central position in the theoretical formulation of psychodynamic and learning models (Wachtel, 1977), until recently, cognitive approaches have paid less attention to the theoretical parameters of anxiety constructs (see Beck & Emery, 1985; Kendall & Ingram, 1987; Michelson & Ascher, 1987). Considering the cognitive-behavioral roots of anxiety hypothesized by many writers (e.g., Ellis & Grieger, 1977; Goldfried & Davison, 1976; Meichenbaum, 1977) and the variety of the cognitive variables empirically linked to anxiety (see Ingram, Kendall, Smith, Donnell, & Ronan, 1987), conceptual models to describe cognition in anxiety are much needed. Elsewhere (Ingram & Kendall, 1986; Kendall & Ingram, 1987) we have presented a theoretical framework for describing the component variables of psychopathological functioning. We suggest that such a model is relevant to anxiety-based disorders, and in this article we present several proposals as to how the model may be applicable to anxiety theory and research.

To further an understanding of the cognitive features of anxiety, a more detailed delineation of the dimensions of "cognition" is required. Dimensions of cognition include cognitive propositions or content, cognitive operations, cognitive products, and cognitive structures (Ingram & Kendall, 1986; Goldried & Robbins, 1983; see also Hollon & Kriss, 1984; Marzillier, 1980; Turk & Speers, 1983). Cognitive propositions (content) refer to the information that is actually represented and considered. Cognitive structures (schemata) can be viewed as the organized manner in which information (content) is internally arranged and represented in memory. Cognitive operations are the processes and procedures by which the cognitive system operates. Cognitive products are the result of the interaction of content, by operations, and within structures. To illustrate, an individual might entertain pathological content, process it in a manner that is normal or pathological, and, in reference to an existing structure, come to an erroneous conclusion (product). A child waiting for his mother to pick him up after school might think, "Why isn't she here!", act on the proposition from a structure of rejection, and con-

clude that "Mom doesn't love me." Such a cognition would be an obvious attributional error when traffic congestion caused the late arrival (see also Kendall, Howard, & Epps, in press).

THE COGNITIVE COMPONENT MODEL OF PSYCHOPATHOLOGY

The cognitive component model we have proposed is diagrammed in Figure 1. Analogous to an analysis of variance, this framework views the ultimate symptomatic expression of any given psychopathology as a function of several converging sources of variance. To illustrate, a two-way ANOVA would partition an experimental result into components represented as Effect = A + B + AB + E, where A represents the unique variance due to a first factor, B represents the variance due to a second factor, AB represents the variance due to the interaction of the factors, and finally, E represents the unpredictable error variance. Analogously, the psychopathological "result" of the component model equals critical psychopathological features plus common psychopathological features plus error variance.

According to this view, *critical psychopathological features* represent unique variance and thus describe variables that are specific to a particular psychopathology. These features not only differentiate generally adaptive from maladaptive functioning but also differentiate one psychopathology

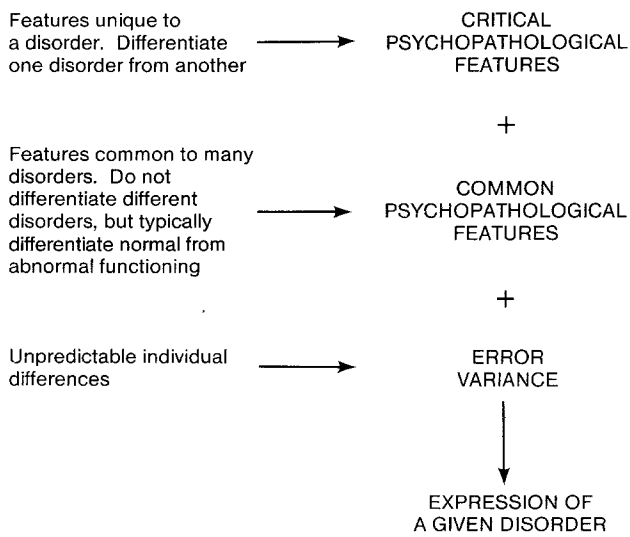

Fig. 1. Conceptual breakdown of sources of variance in psychopathology.

from another. *Common psychopathological features,* on the other hand, describe the shared or common variance among various disorders. As such, these features do not differentiate specific psychopathologal states but do more broadly separate adaptive from maladaptive functioning. *Error variance* represents the unpredictable variance in the expression of any given psychopathology that will be due to several factors, including any individual differences within the persons involved. Leaving aside unpredictable error variance, in what follows we will offer some preliminary suggestions as to the possible critical and common features in anxiety disorders as they relate to various components of cognition.

In addition to distinctions between critical and common psychopathological components, distinguishing between *cognitive distortions* and *cognitive deficiencies,* as has been suggested in relation to child psychopathology (Kendall, 1985), may also prove worthwhile when considering anxiety. Cognitive distortions involve active information processing on the part of the person but include inaccurate or "crooked" processing. There is reflective thought associated with perception of environmental events, but the products of this processing are inconsistent with external, realistic conlusions based on the same input. Examples of cognitive distortions in depression have received much research attention. Difficulties associated with cognitive deficiencies are, in contrast, resultant from inactive or deficient information processing. In these instances, it is the absence of forethought or environmentally focused attention that contributes to the behavioral maladjustment.

CRITICAL FEATURES

Extant research suggests several features that are relatively unique to anxiety disorders. In particular, these features revolve around schema content and functioning, a temporal distortion placing an inordinate emphasis on aspects of impending future events, and task-irrelevant cognitive content.

Schema Content and Functioning

Schema constructs have generated enthusiasm in cognitive, social, and clinical psychology (see Ingram, 1986). Although definitions vary considerably (Kihlstrom & Nasby, 1981; Winfrey & Goldfried, 1986), experimental cognitive usage has generally focused upon the structural or organizational aspects of schemata (Anderson, 1980), while social and clinical researchers have tended more to describe schemata in terms of their propositions—that is, the content that is stored in the structure. Social psychologists, for example, have frequently described the characteristics of "self"-schemata (e.g.,

Markus, 1977; Markus & Sentis, 1982; Taylor & Crocker, 1981), while clinically oriented researchers have discussed "depressive" schemata (e.g., Beck, 1967, 1976; Ingram, 1984; Kuiper, Derry, & MacDonald, 1982).

Not surprisingly, the schema construct has been extended to anxiety disorders (e.g., Beck & Emery, 1985; Mueller & Thompson, 1984). While the structural aspects of the schema concept may be very similar across different disorders, to the extent that anxious individuals have schemata representing distinct propositions, the "anxious schema" is viewed as a critical feature. According to Beck (1976; Beck & Emery, 1985), for example, the cognitive propositions incorporated in anxious schemata reflect the themes of *danger or harm* to the individual. The sources are varied: In the case of social anxiety, the fear (threat) pertains to the perceived possibility of negative evaluation by others. In cases such as panic disorders, the perception of danger is due more to internal variables, such as physical sensations that the person believes are indicative of, for instance, a heart attack (cf. Beck & Emery, 1985; Clark, 1986; Goldstein & Chambless, 1978). Other sources of harm might be the risk of injury or death in the environment, such as falling from a high place, being bitten by an animal, or perhaps suffocating in an enclosed space.

Dog phobics, for instance, (Landau, 1980), have been found to have a poorly articulated semantic structure for categories involving the feared object. Landau's analyses further suggest that two dimensions, size and ferocity, accounted for the largest percentage of variance in dog phobics' associations of the feared object. Non-dog phobics might be expected to employ other dimensions, such as attractiveness, breed, grooming, and posture. Hence, the dog phobic's cognitive structure appears to facilitate the perception of threat.

The internal representations discussed thus far relate to the *self*-schema of the individual—that is, the sense of experiencing fear as a result of some perceived danger to the self. A further distinction might be made regarding the schemata operative in anxiety states. Kendall and Ingram (1987) suggest that there may be at least two anxiety-linked schemata relevant to the description of cognitive functioning in anxiety. Data indicate that while in their "ordinary" condition, anxious individuals may have schemata consisting of propositions relevant to the self (i.e., they see themselves as anxious or fearful; e.g., Ingram et al., 1987; Mueller & Thompson, 1984), while in perceived threatening or dangerous *situations,* a relative shift occurs away from the self-schema to schema designed to facilitate the processing of danger cues (e.g., Merluzzi, Rudly, & Krejei, 1986; Smith, Ingram, & Brehm, 1983) either externally in the environment or internaly within the self. Thus, the socially anxious individual, when not in a socially arousing situation, has a schema operative that defines anxious features about the self. When a socially arousing situation is encountered, however, we propose that a shift to an "other

evaluative" schema may occur. This schema contains propositions relevant to *evaluations by others.* For the individual in this situation, the view of self as anxious is no longer as salient, but rather there may now be a schema in place that facilitates the pickup of information concerning how others are evaluating him or her. This conceptualization of the cognitive functioning in anxiety is consistent with the distinction between state and trait anxiety (Cattel & Scheier, 1958; Spielberger, 1972) and, similarly, corresponds to the demonstrated predictive validity of situational-specific measures of anxiety (Endler, 1975; Kendall, 1978). By discussing two "different" schemata, of course, we do not mean to imply that these are unrelated cognitive structures but instead that these are closely linked, yet *functionally* different, structures. The individual who has an "other evaluative" schema activated is not necessarily experiencing self-relevant cognitions but rather is experiencing a preponderance of thinking that concerns what others might be thinking.

Temporal Distortion: Disproportionate Emphasis on the Future

We propose that the temporal quality of thinking in anxiety is characterized largely (but not exclusively) on future events, situations, possibilities, and consequences. This disproportionate future focus may take many forms.

One form that we have previously suggested (Kendall & Ingram, 1987) concerns an *automatic questioning* process similar to the automatic thinking process Beck (1967) has described in depression. In automatic thinking the focus is on conclusions and *declarative* statements (e.g., "I *am* a failure," "Things *will* never change"). In what we have proposed as anxious *automatic questioning,* on the other hand, the internal dialogue focuses on questions about the adequacy of the individual in the situation or in the impending situation. (e.g., "What *will* they think about me?" "*Are* they laughing at me?" "*Will* I flunk this test?"). Preliminary data from studies of the cognitive content associated with anxiety (i.e., Anxious Self-Statement Questionnaire; Kendall & Hollon, 1987) are supportive of the notion that anxious persons are more frequently questioning the future.

A distinction is drawn between the "normal" reflective process of asking oneself questions and seeking solutions and the rapid, automatic, and pervasive questions reflecting impending incompetence for the anxious individual. We further suggest that the automatic questioning process occurs in both verbal and imaginal form. That is, the process may take the form of images of what the individual fears might happen in the situation, or it may take the form of verbal questions that the individual asks him- or herself.

Anxiety-Linked Cognition

Thus far we have discussed the future focus of anxious individuals and the automatic questioning process that we propose is indicative of this focus. Although we maintain that this kind of cognition constitutes the majority of thinking during heightened anxious states, there are other types of cognition that also occur. In line with much information-processing theory and research (see Ingram, 1986), we suggest that when the individual is in an anxious state, he or she is more likely to retrieve from memory stored instances of past anxiety situations and reactions (see also Mathews & MacLeod, 1985). Functionally, such cognitions serve to reinforce and perhaps exacerbate the individual's state of anxiety since the person now has better access to anxiety-consistent information and, presumably, less access to anxiety-inconsistent information. Thus, although we propose that most of the anxious person's cognitions are future-oriented, when they do not represent this tense, they are more likely to be composed of past anxiety-revelant memories.

Task-Irrelevant Thought

One theme common to all of the above-mentioned cognitive products is that they are largely irrelevant to cognition necessary to efficiently perform tasks. While such task irrelevancy may be common to many disorders, the anxious *content* of these irrelevant thoughts appears to differentiate them from other disorders. In a recent study, for example, Ingram et al. (1987) found that while depressed and test-anxious individuals were both characterized by task-irrelevant thoughts, the content was quite different: Depressed individuals reported negative self-referent thoughts (e.g., "I'm up against the world") while anxious individuals experienced more diffuse, less self-relevant but distracting thoughts (e.g., "I thought about how much time was left in the experiment"). Thus, although the outcome (distraction from the task) may have been similar, the *content* of the distracting thoughts was quite different. Further, these findings are in line with long-established theoretical models of anxiety which suggest that an important aspect of anxious affect is task-irrelevant cognition (see Sarason, 1975, 1980).

COMMON FEATURES

In addition to the features described as critical to the cognitive side of anxiety, there are cognitive features of anxiety that are common to a variety of other related disorders. We suggest that self-absorption, the predominance

of automatic information processing, and asymmetry in the balance of positive and negative thinking are common cognitive features.

Self-Absorption

A variety of sources have suggested that an excessive degree of self-focused attention, defined as attention focused inwardly on the self as opposed to outwardly toward the environment (Carver & Scheier, 1981, 1983; Duval & Wicklund, 1972), is a factor common to several disorders. Several writers (e.g., Deffenbacher, 1978; Meichenbaum, 1977; Sarason, 1975, 1978; Wine, 1971, 1982) have argued that the performance deficits observed in anxiety states are due to dysfunctional preoccupation with the self as opposed to the task. Similarly, following theoretical proposals of a link between self-focusing and depression (e.g., Kanfer & Hagerman, 1981; Lewinsohn, Holerman, Teri, & Hautzinger, 1985), a number of studies of subclinical (Pyszczynski & Greenberg, 1985; Ingram & Smith, 1984; Smith & Greenberg, 1981) and clinical depression (Gibbons et al., 1985; Ingram, Lumry, Cruet, & Sieber, 1987) have found evidence of a link between depression and heightened self-focused attention. Hull and Reilly (1986) have also reviewed evidence to suggest that individuals consume alcohol to reduce the increased self-focusing associated with negative personal outcomes. Although heightened self-focusing is not always maladaptive (and indeed can be adaptive), when this process becomes excessive and inflexible, processes together referred to as *self absorption* (Ingram, 1987), self-focusing seems to be a common aspect of a number of different psychopathologies.

Predominant Automatic Information Processing

Schneider and Shiffrin (1977) have drawn a distinction between automatic and purposeful, or controlled, information processing. According to this distinction, automatic processing is largely effortless, proceeds without individual control, is independent of the capacity constraints of the system, and demands little attention or awareness. We use the term *automatic* here in a manner that is somewhat different from traditional experimental usage, but in a fashion that is consistent with several clinical concepts. Several writers have maintained that depression is characterized by an automatic thinking that leads to intrusive, repetitive, negative self-relevant thoughts (Beck, 1967; Hollon, Kendall, & Lumry, 1986), depressogenic attributions (Seligman, 1981), or self-monitoring of negative information (Rehm, 1977). The key dimension here is that this dysfunctional information processing happens in

a nonvolitional, or automatic, way. In a similar vein, anxiety disorders seem also to be characterized by an overreliance on automatic processing (Beck & Emery, 1985). To illustrate but one example, the DSM-III diagnostic criteria for obsessive-compulsive disorder specify as part of the features necessary for diagnostic classification "recurrent, persistent ideas, thoughts, images, or impulses. . . that are not experienced or voluntarily produced, but rather as thoughts that invade consciousness. . ." (American Psychiatric Association, p. 235). Likewise, a variety of theoretical, diagnostic, and research efforts have suggested that psychotic disorders, such as schizophrenia (Saccuzzo & Braff, in press), are characterized by dysfunctional automatic cognition. Note that although the content or products of this thinking may differ dramatically across various disorders, the automatic process appears strikingly similar.

It is also important to note that a factor common to these disorders is the lack of perspective related to this automatic processing. That is, perceptions and thoughts arising from automatic processing are typically acted upon as reflecting reality rather than being a stimulus for insightful reflection. Thus, while the anxious individual does not stop to question the exaggerated perceptions of internal or external threat, the depressed person tends to believe the negative thoughts that occur or the negative view of the world. Similarly, the paranoid person does not entertain the possibility that the actions of others do not represent an attempt to get him or her. While automatic processing to some degree is a necessary component of efficient functioning, and while normal individuals also at times believe too readily in the thought and perception that may occur automatically, presumably they have the capability and flexibility necessary to reflect upon the accuracy or inaccuracy of their cognitions. That is, normal functioning individuals seem to have the ability to engage in metacognition when necessary, a process that many cognitive therapies seek to teach (Ingram & Hollon, 1986; Kendall & Braswell, 1985; Meichenbaum & Asarnow, 1979).

Capacity Limitations

Studies have suggested that reductions in cognitive capacity necessary for effective task performance are characteristic of anxiety (e.g., Mueller & Thompson, 1984) as well as other diverse disorders (e.g., depression—Ingram, 1984; schizophrenia—Magaro, 1980; Neale & Oltmanns, 1980). We propose that such reductions are probably representative of deficits in information storage and retrieval processes and are most likely caused by the self-absorption and automatic processing of dysfunctional information that does not leave adequate "room" for processing task-relevant information.

Cognitive Asymmetry

Kendall (1983, 1984) proposed that a disproportionate amount of variance in influencing affect and behavior is due to negative self-talk as compared to positive self-talk. Termed "the power of nonnegative thinking," research results are generally confirmatory. For instance, assertive subjects, as opposed to unassertive ones, reported fewer negative self-statements but comparable positive self-statements (Schwartz & Gottman, 1976). Cacioppo, Glass, and Merluzzi (1979) reported that whereas neither the number of positive nor the number of neutral self-statements were related to self-evaluation, the more negative the self-statements, the lower the self-evaluations. Kendall and colleagues (Kendall et al., 1979) also reported that a low frequency of negative self-talk, and not the presence of positive self-talk, was associated with adapting to stress. There thus appears to be consistency in the predictiveness of nonnegative thinking, relative to positive thinking, when considering aspects of psychological adjustment.

Building on the power of nonnegative thinking construct, (Schwartz 1986; Schwartz & Garamoni, 1986) has reviewed evidence suggesting that psychopathology is characterized by an asymmetry in the balance between positive and negative cognition (in addition to negative cognition per se). As such, this asymmetry represents a factor potentially common to a variety of dysfunctional states. Schwartz and Garamoni (1986) maintain that "normal" cognitive functioning consists of a roughly 2 to 1 proportion of positive to negative thinking. As dysfunction develops, it is suggested that this balance begins to shift to a proportionally greater degree of negative cognitions. In mild psychopathology, or subclinical anxiety states, an equal proportion of negative and positive thinking is achieved, a condition that Schwartz and Garamoni have labeled "the internal dialogue of conflict." As psychopathology becomes more severe, and thus of clinical proportions, the balance continues shifting in a negative direction. One key dimension common to psychopathology, therefore, appears to lie in the relative balance of positive and negative thought. Recent data, comparing both psychometrically defined and clinically defined cases of depression to nondepressed persons, support the ratios proposed by Schwartz and Garamoni (Kendall, Howard & Hays, 1987).

CLOSING

As noted earlier, conceptual models specifying the cognitive variables in anxiety are much needed. In this article we have proposed one such model that emphasizes delineation of the sources of cognitive variance contribut-

ing to anxiety disorders. Further, we have speculated upon the extant constructs that may fit with the proposed categories of variance. Our immediate hope is that the proposals of this framework will be empirically tested. Our broader hope is to stimulate cognitive-behavioral theorists, researchers, and clinicians to turn their attention to understanding the cognitive aspects of anxiety.

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