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FOUR-FACTOR THEORY AND THE ANXIETY DISORDERS

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Resumen: La presente revisión teórica se centra en la Teoría de los Cuatro Factores de los Trastornos de Ansiedad (Eysenck, 1997). Según este modelo teórico, existen cuatro fuentes de información que determinan la experiencia de ansiedad (los estímulos ambientales amenazantes, la propia actividad fisiológica, la conducta y las cogniciones negativas sobre el futuro); estas fuentes de información son también relevantes en los trastornos de ansiedad. En el presente artículo se revisa y actualiza el modelo teórico a la luz de las investigaciones que se han publicado en los últimos 10 años. El modelo teórico contempla cuatro trastornos de ansiedad estrechamente relacionados con las fuentes de información: trastorno de pánico, fobia social, trastorno obsesivo-compulsivo y trastorno por estrés posttraumático. Se concluye que el modelo actualizado proporciona un marco prometedor de actuación pero es necesario realizar más investigación en relación a la comorbilidad.

Palabras Clave: Trastornos de ansiedad, sesgos cognitivos, fisiología, conducta.

Title: *La teoría de los Cuatro Factores y los Trastornos de Ansiedad*

Problem background

Eysenck (1997) argued that it is important to try to understand the number and nature of anxiety disorders within an overall conceptual framework. This he endeavoured to do in his four-factor theory of the anxiety disorders. The starting point

Abstract: This theoretical review is concerned with Eysenck's (1997) four-factor theory of the anxiety disorders and its revision. According to the theory, four sources of information (environmental threat; an individual's physiology; an individual's behaviour; and an individual's negative future-oriented cognitions) determine the experience of anxiety, and these sources of information are directly relevant to the anxiety disorders. This theory is discussed with reference to research that has been published over the past 10 years and a revised version is proposed. In this revised theory, each of four anxiety disorders (panic disorder; social phobia; obsessive-compulsive disorder; and posttraumatic stress disorder) are regarded as associated primarily with a different source of information. It is concluded that the revised theory provides a promising framework. However, more research on comorbidity is needed to clarify the interconnections among components of the emotional system underlying anxiety.

Key words: anxiety disorders, cognitive biases, physiology, behaviour.

for the theory was to identify the main sources of information that determine an individual's level of experienced anxiety. It has generally been assumed (e.g., Lazarus, 1991) that the experience of anxiety depends mainly on threat-related environmental stimuli and situations, and this assumption is totally consistent with much of the available evidence. However, Eysenck (1997) discussed evidence indicating that there are three other relevant sources of information: the individual's own physiological state (e.g., heart rate); the indivi-

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dual's own behaviour (e.g., signs of nervousness); and the individual's own negative future-oriented cognitions (e.g., perceived future responsibility for one's actions). What is important with respect to each of the four sources of information is the perceived threat associated with it, which is determined by the amount of attention it receives and the precise interpretation of the information attended to. Experienced anxiety will be greatest when excessive attention is paid to a source of threat-related information (attentional bias) and when information from that source is interpreted as being very threatening (interpretive bias).

One of the important theoretical issues considered only briefly within the original formulation of four-factor theory was the extent to which the anxiety system functions in an interconnected fashion. Eysenck (1997) pointed out that interpreting the environment as threatening often has the effect of increasing physiological activity, behavioural anxiety, and threat-related cognitions, and so the four sources of information should not be regarded as entirely separate in their functioning.

According to four-factor theory, we might expect to find a different anxiety disorder associated with each of the four sources of information influencing the experience of anxiety, although it would be naïve to expect the associations to be precise. The central assumptions of the theory were concerned with possible relationships between anxiety disorders and sources of information. First, it was assumed that panic disorder is associated with attentional and interpretive biases for one's own physiological state. Second, social phobia is associated with attentional and interpretive biases for one's own behaviour. Third, specific phobia is associated with attentional and interpretive biases for environmental stimuli. Fourth, obsessive-

compulsive disorder is associated with attentional and interpretive biases for future-oriented cognitions.

What determines which anxiety disorder develops in any given individual who is vulnerable to anxiety (e.g., through having a high level of trait anxiety)? There are clearly several valid answers to that question. However, what may be of special importance in determining the specific anxiety disorder that develops is the prior existence of realistic concerns about a particular source of information. According to the theory, individuals could develop realistic concerns about their internal physiological state if they have suffered from a serious respiratory condition, and this could act as a predisposing factor for panic disorder. Individuals could develop realistic concerns about their own behaviour if they have often experienced difficulties in social communication and interaction (e.g., by being introverted), and this could act as a predisposing factor for social phobia. Individuals could develop realistic concerns about certain specific environmental stimuli if they have been exposed to aversive conditioning experiences in the presence of those stimuli, and this could act as a predisposing factor for specific phobia. Finally, individuals could develop realistic concerns about future threat-related events if they have been placed in situations involving high levels of personal responsibility (e.g., pregnancy and giving birth for women), and this could act as a predisposing factor for obsessive-compulsive disorder.

Research published prior to 1997 provided reasonable support for the assumptions of four-factor theory regarding realistic concerns associated with each of the anxiety disorders. First, there is the assumption that respiratory diseases can act as a predisposing factor for panic disorder. Verburg, Griez, Meijer, and Pols (1995)

found that patients with panic disorder were much more likely than patients with other anxiety disorders to have suffered from a respiratory disease prior to the onset of the disorder: the figures were 43% and 16%, respectively.

Second, there is the assumption that realistic concerns about an individual's social skills and interpersonal communication due to introversion could predispose to social phobia. Support was reported by combining the data from Stemmerger, Turner, and Beidel (1995) with those from Enright and Beech (1990). Patients with social phobia had an extremely low mean extraversion score (more than one standard deviation below the population mean), which was lower than that of patients with various other anxiety disorders. However, the data are correlational, and it is possible that the development of social phobia produces greater introversion.

Third, there is the assumption that threatening environmental events can predispose to specific phobia. There is much evidence supporting this assumption (see Eysenck, 1997, for a review). However, the fact that most specific phobias relate to objects that were dangerous in our evolutionary past rather than to objects that are currently dangerous and the fact that many patients with specific phobias cannot recall any highly unpleasant experiences relating to the phobic object (Keuthen, 1980) suggest that the overall support for the assumption is limited.

Fourth, there is the assumption that realistic concerns about personal responsibility (e.g., pregnancy and giving birth) can predispose to obsessive-compulsive disorder. Buttolph and Holland (1990) reported relevant evidence. They found that 69% of female obsessive-compulsive disorder patients reported the onset or the worsening of their symptoms during pregnancy or shortly after childbirth. This makes sense if

we assume that the great majority of women regard having a child as a major source of additional personal responsibility.

Developmental features of the problem

Recent evidence

In the years since 1997, many studies of relevance to four-factor theory have been published. Much of this evidence has provided additional support for the theory or has suggested minor additions to it. The assumption that susceptibility to respiratory diseases predisposes to panic disorder was tested in a novel way by van Beek et al. (2005). They found that 24% of the first-degree relatives of panic patients had suffered from obstructive pulmonary disease and 10.5% from asthma. These figures were much higher than for the first-degree relatives of patients with other anxiety disorders (13% and 3%, respectively).

The assumption that realistic concerns about social functioning and skills predispose to social phobia was tested thoroughly by Bienvenu et al. (2001). They found that social phobics, on average, scored lower on extraversion than did agoraphobics, panic disorder patients, specific phobic patients, or patients with major depressive disorder.

The assumption that realistic concerns about personal responsibility can predispose to obsessive-compulsive disorder has received additional support since 1997. For example, Labad, Menchon, Segalas, Jiménez, and Vallejo (2005) found with pregnant women that 50% of them showed a worsening of obsessive-compulsive disorder symptoms postpartum.

Theoretical changes

There are various limitations with Eysenck's (1997) theory that require revisions to it. First, generalised anxiety disorder and

posttraumatic stress disorder are both important anxiety disorders, but neither was fully incorporated within the theory. Second, one of the four anxiety disorders discussed in detail within the theory was specific phobia. However, it is typically less disruptive of everyday life than are the other anxiety disorders, and so it is arguable whether it should be considered an anxiety disorder. Third, while it was accepted that there are interactions and interconnections among the four sources of information, these interactions were not considered in any detail. For example, patterns of comorbidity can potentially shed light on such interactions, but comorbidity was not discussed. Fourth, research published since 1997 suggests that some changes are needed to the theory. Of particular importance is the notion that the theory is applicable cross-culturally.

The revised version of four-factor theory addresses all of the above limitations. The main change to the basic theory is that the anxiety disorder now identified as depending primarily on environmental threat is posttraumatic stress disorder. By definition, the central aetiological factor in the development of posttraumatic stress disorder is the occurrence of an extremely threatening environmental event, and so this disorder clearly depends more on that source of information than any other. The situation is less clear-cut with specific phobias in that patients often cannot recall any specific environmental events that seemed to trigger the phobia. In addition, specific phobias tend to involve objects (e.g., snakes; spiders) that were far more threatening in our evolutionary past than currently. This suggests that internal factors such as preparedness are important as well as the environmental stimuli *per se*.

The revised version of four-factor theory shares with the original version the omission of generalised anxiety disorder. It

is now assumed that generalised anxiety disorder can appropriately be regarded as a personality disorder that has much in common with high levels of trait anxiety in normal individuals. There are various reasons for making that assertion. First, there is frequently no specific aetiological factor that can be identified as preceding generalised anxiety disorder. Rapee (1991) found that 80% of generalised anxiety disorder patients could not recall when or how it started. This is as expected if it reflects an underlying anxious temperament. Second, generalised anxiety disorder is very often a chronic condition that changes relatively little over time. Indeed, Rapee (1991) found that many patients with generalised anxiety disorder report that the disorder has been lifelong. Third, Garyfallos *et al.* (1999) found that 53% of patients with generalised anxiety disorder had one or more personality disorders, especially avoidant, obsessive-compulsive, and dependent personality disorders.

The revised version of four-factor theory addresses the issue of comorbidity. It is assumed that any given anxiety disorder typically develops initially with respect to only one of the four sources of information associated with experienced anxiety. After that, attempts by patients to understand the nature of their disorder can cause attentional and interpretive biases to develop for a second information source. It is argued that potentially important information concerning comorbidity is available in the form of asymmetries (i.e., disorder A precedes disorder B much more often than B precedes A). We will briefly (and speculatively) consider two such cases. First, panic disorder precedes agoraphobia far more often than the opposite. We speculate that it is the attempt by panic disorder patients to identify a trigger for their panic attacks that causes them to focus on environmental sources of information.

Second, there is evidence that social phobia precedes panic disorder much more than panic disorder precedes social phobia in comorbid patients (e.g., Stein, Shea, & Uhde, 1989). Social phobics and those high in social anxiety attend more to their internal physiological state than healthy controls and also are more likely to believe that their external behaviour directly reflects their internal physiological state (e.g., Papageorgiou & Wells, 2002). Thus, social phobics may focus on their internal physiological state in an attempt to understand their perceived inadequate social behaviour (Spurr & Stopa, 2002), and this could play a role in the development of panic disorder as a comorbid disorder. In contrast, panic disorder patients do not attend especially to their own behaviour in order to understand the reason for their panic attacks.

How has recent research suggested changes in the original four-factor theory? According to the original theory, respiratory diseases such as bronchitis predispose to panic disorder. Recent research suggests that a broader range of factors relating to the functioning of the respiratory system should be taken into account. For example, Bouwer and Stein (1997) considered the lifetime incidence of traumatic suffocation experiences such as near drowning, near choking, and torture by suffocation. They found that three times as many panic disorder patients as those with social phobia or major depression (19.3% vs. 6.7%) reported traumatic suffocation experiences. In similar fashion, Alkin (1999) reported that 32% of panic disorder patients seen during a 6-month period reported near-drowning experiences.

Biber and Alkin (1999) identified another possible predisposing factor for panic disorder related to the respiratory system, namely, smoking. They found that 73% of panic disorder patients smoked,

which is far higher than the incidence of smoking in the general population. They also found that more severe panic cases had smoked more than twice as many cigarettes as less severe cases (12.5 vs. 4.8 pack-years, respectively).

Some research suggests that the theory can be applied on a cross-cultural basis. For example, consider the assumption that introversion predisposes to social phobia. It follows that cultures in which the mean level of extraversion is low might be at more risk of social phobia than those in which it is higher. Supporting evidence was obtained by W. Eysenck and M. Eysenck (submitted). They correlated the lifetime incidence of social phobia across several countries with the mean extraversion level in the same countries. They obtained the predicted negative correlation ($r = -0.35$), indicating that social phobia is more prevalent in introverted countries.

It is also possible to consider personal responsibility from a cultural perspective. There is more emphasis on personal responsibility in individualistic cultures than in collectivistic ones, and so we might predict that the incidence of obsessive-compulsive disorder would be greater in the former cultures. Preliminary evidence supports that prediction. Essau et al. (2004) found that there were substantially more obsessive-compulsive symptoms in children living in an individualistic culture (Germany) than those living in a collectivistic culture (Japan). It would be of great value to extend this line of research to other individualistic and collectivistic cultures.

Conclusions

The revised version of four-factor theory is based squarely on the original version but incorporates several new assumptions, all of which have empirical support. First, it is now assumed that posttraumatic

stress disorder rather than specific phobia is the anxiety disorder most directly influenced by environmental stimuli. Traumatic environmental stimuli always form an important part of the aetiology of posttraumatic stress disorder, whereas highly aversive environmental situations relating to the phobic object prior to the onset of phobia are often not recalled in patients with specific phobia.

Second, the assumption is clearer in the revised version of the theory that generalised anxiety disorder should be regarded as a personality disorder rather than as an anxiety disorder. The fact that generalised anxiety disorder is often a lifetime condition, that it generally has no known triggering factors, and the fact that there are close similarities in the attentional and interpretive biases associated with generalised anxiety disorder and high trait anxiety (Eysenck, 1997) are all consistent with that assumption.

Third, it is now assumed that the predisposition to panic disorder can be based on several factors that impact on the respiratory system rather than (as in the original theory) focusing specifically on respiratory diseases. Evidence indicating that panic disorder patients are more likely than those with other anxiety disorders to have experienced traumatic suffocation (Alkin, 1999; Bouwer & Stein, 1997) or to be chronic smokers (Biber & Alkin, 1999) indicates that the revised version is more in accordance with the evidence.

Fourth, the original version of four-factor theory ignored the role of cultural factors as predisposing to anxiety disorders. There is preliminary evidence that

cultural factors are associated with the incidence of obsessive-compulsive disorder (Essau et al., 2004) and of social phobia (W. Eysenck & M. Eysenck, submitted). However, this is an area in which much more research is urgently needed.

Fifth, the revised version of the theory attaches more weight to the importance of comorbidity than the original version. More specifically, it is assumed that realistic concerns about one of the four major sources of information influencing experienced anxiety play a role in predisposing to a given anxiety disorder. Thereafter, attempts by the patient to understand or explain his/her condition can be of relevance to the development of a subsequent anxiety disorder. It is very difficult to interpret comorbidity evidence. However, asymmetries in comorbidity (e.g., panic disorder precedes agoraphobia far more than the opposite; social phobia precedes panic disorder more than the contrary) can speculatively be accounted for within the revised version of the theory.

Finally, it is clear that there is much scope for developing the theory further. There is also much scope for additional empirical research designed to submit the assumptions of the theory to more rigorous tests to identify more precisely its strengths and limitations.

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