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Chapter 10

Cognitive Phenomena in Social Anxiety Disorder

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Historically, the notion of cognitive vulnerability to psychopathology has most often been associated with the study of depression, and particularly with the study of hopelessness depression, a subtype of the disorder proposed by Abramson, Metalsky and Alloy (1989). The hopelessness theory of depression distinguishes between distal and proximal factors that contribute to the disorder. Distal factors occur at the beginning of the chain of events that eventually leads to the expression of the symptoms of hopelessness depression. According to Abramson and her colleagues, a major distal influence is attributional style. Specifically, people who end up depressed tend to make stable and global attributions for negative events in their lives. Yet, simply having this attributional style does not *cause* depression. Rather, people must also experience negative events in their lives. Abramson et al. (1989) propose that a diathesis-stress approach can be used to understand these contributory factors, such that a depressogenic attributional style (the diathesis) and negative life events (the stress) interact to increase the likelihood that a person will experience the symptoms of depression in the future.

In their hopelessness theory of depression, Abramson et al. (1989) also discuss a specific proximal cause of the disorder – hopelessness. Hopelessness occurs close in proximity to the onset of depressive symptoms, and according to these authors, is a "sufficient" cause – meaning that the presence of hopelessness guarantees the occurrence of depressive symptoms. They suggest that when people expect negative outcomes of events in their lives *and* believe that they are helpless to change these outcomes, they will experience the symptoms of hopelessness depression. Other proximal contributory causes, such as lack of social support, might also play a role in the onset of depressive symptoms. Abramson et al.'s (1989) hopelessness theory of depression is premised on the idea that there is a specific and identifiable chain of events leading from distal and contributory proximal causes to an eventual culmination in hopelessness (the proximal sufficient cause) which then elicits the symptoms of hopelessness depression, and research has provided ample support for this notion (see Abramson et al., 1989).

In this chapter, we discuss cognitive vulnerability for social anxiety disorder. The concept of cognitive vulnerability is not as well developed in social anxiety disorder as it is in depression. Yet, the literature provides us with information on possible distal and proximal risk factors that may contribute to the development of social anxiety disorder or the occurrence of episodes of social anxiety. In the initial part of this chapter, we look at possible distal risk factors – those that occur relatively early in the chain of events that culminates in the symptoms of social anxiety disorder. Specifically, we review events that may occur in the family and within the context of peer relations. Early experiences with either family or peers may contribute to the development of thinking styles associated with social anxiety disorder. In the latter part of this chapter, we explore possible proximal risk factors – those that seem to occur in closer relation to the onset of symptoms. Specifically, we will explore the cognitive styles of adults with social anxiety disorder, focusing on attentional biases, memory biases and judgment-interpretation biases that might play a role in the onset and maintenance of the disorder.

Early Risk Factors for Cognitive Vulnerability to Social Anxiety Disorder

Social anxiety disorder, the most prevalent of the anxiety disorders, is characterized by intense fear and discomfort in social and/or performance situations (American Psychiatric Association (APA), 1994). Commonly feared situations include public speaking, initiating and maintaining conversations, asserting oneself, and eating, drinking and writing in front of others (Holt, Heimberg, Hope, & Liebowitz, 1992). These fears often lead to significant impairment in social, educational and occupational functioning (e.g., Schneier et al., 1994). In the National Comorbidity Survey (NCS; Kessler et al., 1994), the lifetime prevalence rate of social anxiety disorder, defined by the criteria specified in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R; APA, 1987), was 13.3%.

Various cognitive models of social anxiety disorder have been proposed (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997). The Rapee and Heimberg (1997) model posits that individuals with social anxiety disorder come to view the world as a harsh and critical place and thus conduct their lives as though they are constantly under the scrutiny of others. Specifically, socially anxious people come to view themselves from the perspective of the audience (most often perceived as critical). However, this mental representation is unlikely to be veridical, but instead is a compilation of the person's concerns about how he or she may come across to others, feedback from internal and external cues, and memories for (mostly negative) events. They then compare this mental representation of self as seen by the audience to the standards that they perceive the audience holds for them. The more the mental representation of the self as seen by the audience falls short of the perception of the audience's standards for the person, the greater the likelihood that the person with social anxiety disorder will expect to be negatively evaluated by the audience. The judgment of likely negative evaluation initiates behavioral, cognitive and physiological symptoms of anxiety, which serve to confirm the socially anxious person's beliefs that he or she has been or will be negatively evaluated by others, and a vicious cycle ensues. Rapee and Heimberg (1997) also point out that when attention is shifted to the representation of the self as seen by the audience, external indicators of negative evaluation

such as a person yawning in the audience during a public speaking experience or a single piece of criticism in an otherwise positive job evaluation become highly salient.

Important to the Rapee and Heimberg model is the person's belief that other people are likely to be critical and that negative evaluation is a probable outcome in social situations. One way to elucidate the origins of these beliefs is to look to early experiences with parents and peers.

Factors related to the family environment and parenting

Attachment

Beginning in early infancy, people develop schemas for understanding their social world via the parent-infant relationship. Bowlby (1982) and others (see Greenberg, 1999) have posited that the early parent-infant relationship has a major impact on personality development and can be predictive of later psychopathology. Attachment theorists have distinguished between secure and insecure attachment relationships (see Dozier, Stovall & Albus, 1999). Securely attached children have parents who are attentive and responsive. These children, who develop the beliefs that they are loved and that their caregivers are loving people, come to possess strong self-esteem and perceptions of competence. Insecurely attached children, on the other hand, have parents who are rejecting and undependable. These children develop the beliefs that they are unloved and that their caregivers are unloving, leading to feelings of anger, mistrust and anxiety. Indeed, Bowlby proposed that anxiety is "the fundamental condition underlying insecure attachment" (Greenberg, 1999, p. 488).

Researchers have not yet explored the relationship between parent-child attachment patterns and the later development of social anxiety disorder. Rather, patterns of *adult* attachment have been studied in individuals with social anxiety disorder based on the assumption that the way people relate to one another as adults has its roots in the early parent-child relationship. Mickelson, Kessler and Shaver (1997) explored adult attachment styles in the NCS and found that social anxiety disorder was negatively related to having a secure attachment style and positively related to having an avoidant or anxious attachment style. A study recently completed in our laboratory (Eng, Heimberg, Hart, Schneier, & Liebowitz, 2001) also found social anxiety disorder to be associated with insecure attachment styles. Eng et al. (2001) found that individuals with social anxiety disorder were more likely than non-clinical controls to be classified as insecurely attached, and insecure attachment was associated with greater severity of social anxiety disorder symptoms. Although some people with social anxiety disorder *do* exhibit secure attachment styles, it is interesting to note that those with insecure attachment styles were also more likely to become depressed.

Behavioral Inhibition

Another issue to consider with regard to infant-parent interaction patterns is infant temperament. Temperament refers to behavioral tendencies that are present in infancy and are presumed to be inherited, given their very early presentation. Interaction patterns are undoubtedly influenced by parental factors (e.g., parental mental illness, marital discord, etc.) but can also be influenced by these early tendencies exhibited by the infant. Particularly relevant to the anxiety disorders is the temperamental style referred to as behavioral inhibition to the unfamiliar. Approximately 15% of infants can be described as behaviorally inhibited. These infants react to novel stimuli (including unfamiliar people) in a fearful way, evidenced by both behavior (e.g., crying) and physiological reactivity (e.g., increased heart rate). According to Kagan, Reznick and Snidman (1988), three-quarters of children who were identified as either behaviorally inhibited or uninhibited at age 2 are similarly classified when re-assessed at age 8.

It is interesting to consider how behavioral inhibition can influence interactions very early in life. People might be less likely to approach infants who cry and appear fearful than infants who have a more outgoing disposition. This aversion might carry into childhood when peers and adults realize that these children might "do better" when left to their own devices. In other words, children who are behaviorally inhibited might have less experience interacting with others and might also find that when they do interact with others, the feedback that they get is less than positive.

Recent research has suggested that behavioral inhibition bears some relation to social anxiety disorder. Parents of behaviorally inhibited children have higher rates of social anxiety disorder than do the parents of uninhibited children (Rosenbaum, Biederman, Hirshfeld, Bolduc, & Chaloff, 1991). Furthermore, retrospective studies with both adolescents (Muris, Merckelbach, Wessel, & van de Ven, 1999) and college students (Hayward, Killen, Kraemer, & Taylor, 1998; Mick, & Telch, 1998) have provided evidence for a relationship between behavioral inhibition in childhood and a later diagnosis of social anxiety disorder.

Other family factors

Children might also learn about social relations from the way that their parents relate to others. Two major themes emerge in the research literature. First, people who develop social anxiety disorder seem to grow up in families where a great deal of importance is placed on making a good impression on others. Caster, Interbitzen and

Hope (1999) found that adolescents who described themselves as socially anxious were more likely than less socially anxious adolescents to report that their parents were concerned with the opinions of others. Similarly, Bruch, Heimberg, Berger and Collins (1989) reported that people with social anxiety disorder were more likely than people with agoraphobia to recall that their parents overemphasized the opinions of others. In Caster et al.'s (1999) study, socially anxious adolescents were also more likely to report that their parents were ashamed of their children's shyness and difficulties in social performance.

How may parental emphasis on the opinions of others be related to the development of cognitive vulnerability to social anxiety disorder? When parents have strong social-evaluative concerns, it makes sense that they will correct their children, constantly telling them how to act and what to say. This scenario may lead children to come to expect threat in social situations and may also lead them to believe that making a good impression on others is a difficult, if not impossible, goal to accomplish (Buss, 1980; Bruch et al., 1989; Cloitre & Shear, 1995).

The second major theme that has emerged in the literature is that children can learn about social relations by watching their parents' behavior in the social arena. This can apply not only to parents' relations with their own peers, but also to parents' abilities to help their children navigate the social world. While some parents who have socially reticent children may purposefully set up social interactions for their children, parents who themselves are socially anxious may be more than happy to facilitate avoidance for their children (which, in turn, serves their own desire to avoid). Bruch et al. (1989) found that people with social anxiety disorder were more likely than people with agoraphobia to report that their parents isolated them from social experiences when they were children. In that same study, people with social anxiety disorder were also more likely to report that their families rarely socialized as a unit. Similarly, in Caster et al.'s (1999) study, socially anxious adolescents were more likely than non-anxious adolescents to perceive their parents as socially isolated.

Two points are important to consider here. Parents who fail to provide their children with the opportunity to learn to interact with others also prevent their children from learning that such interactions can be rewarding and pleasurable. From a young age, then, some people may get caught in a vicious cycle of social avoidance and distress. Furthermore, parents may also communicate to their children that social situations are dangerous and should be feared. Thus, children may become more likely to notice threat in the environment and, furthermore, may be more likely to respond to such threat in a negative and maladaptive way.

Factors related to peer relations

As children grow older, they spend less time in the company of family and more time in the company of peers. As such, their beliefs about their abilities in the social world are undoubtedly influenced by peer relations. The relationship between social anxiety and peer relations is a difficult one to disentangle. The research seems to suggest the existence of a reciprocal relationship such that socially anxious children are more likely than non-anxious children to experience negative peer relations, most notably peer neglect (La Greca, Dandes, Wick, Shaw, & Stone, 1988; Strauss, Lahey, Frick, Frame & Hynd, 1988), and that these experiences lead to the exacerbation and maintenance of social anxiety.

Two studies have examined this complex relationship. Rubin and Mills (1988) assessed different types of social isolation in a group of school children during the second, fourth and fifth grades. Children who were classified as behaving in a passive, solitary way while at school were rated by their peers as more anxious, withdrawn and asocial than other children and were also more likely to be rejected (and less likely to be accepted) by their peers. This relationship between passive withdrawal and peer rejection got stronger as children got older. The authors also reported that the best predictor of loneliness during the fifth grade was low self-perceived social competence during the second grade. This study suggests that repeated peer rejection directed at passive, withdrawn children might contribute to the cognitive style associated with social anxiety disorder. Such children, based on repeated social failure, may develop a belief that they cannot succeed in social situations, leading them to then avoid social interactions with their peers and in turn, leading to increasing loneliness as they get older.

Vernberg, Abwender, Ewell and Beery (1992) looked at the relationship between social anxiety and peer relations in a sample of adolescents whose families had recently moved to a new community. Studying the adolescents over the course of their first year in the new community, Vernberg et al. (1992) found that social anxiety was associated with less frequent peer interactions in the first few months of school (for both boys and girls) and to less intimate friendships (for girls only) in the later part of the year. Peer exclusion was associated with increased social anxiety as the year progressed. In light of Vernberg et al.'s study, it is interesting to note that in an epidemiological study, moving more than three times as a child was positively related to a diagnosis of social anxiety disorder among children (Chartier, Walker, & Stein, 2001). However, these data do not permit an examination of cause and effect; as in Vernberg et al.'s study, it might be the case that socially anxious children have a more difficult time with making new friends after moving and that these difficulties lead to an exacerbation of social anxiety over time.

One interesting study on the relationship between social anxiety and peer relations in a clinical sample also deserves comment. In line with research in non-clinical samples of socially anxious children, Spence, Donovan and Brechman-Toussaint (1999) found that children with social anxiety disorder experienced more negative social interactions than did control children. Based on school observations, children with social anxiety disorder were found to have fewer positive interactions with their peers than were control children (the groups did not differ on negative or "ignore" interactions). Furthermore, children with social anxiety disorder were found to initiate interactions with peers less frequently than control children and were also found to have fewer peer interactions, suggesting that other children tended not to initiate interactions with them either. Spence et al. (1999) also reported on the impact that these experiences seemed to have in terms of cognitive style. When children in their study were presented with negative and positive social events and asked about the likelihood of these events occurring, children with social anxiety disorder were less likely than control children to expect positive social situations to occur and tended to be more likely than control children to expect negative social situations to occur. It is interesting to note that this pattern is in line with findings in the literature in adults with social anxiety disorder (e. g., Amir, Foa & Coles, 1998a), suggesting that cognitive biases with regard to social experiences may develop very early.

In line with the findings on difficulties with peer relations in socially anxious children, two studies have explored retrospective memories of childhood peer relations in socially anxious adults. Roth, Coles and Heimberg (2002) found that college students' high scores on a measure of social anxiety were related to reports of frequent teasing during childhood. In a recent unpublished study, McCabe et al. (2000) found that eighty-five percent of participants with social anxiety disorder recalled having been teased or bullied during childhood. Patients with social anxiety disorder were more likely to recall having been teased or bullied than were patients with obsessive-compulsive disorder or panic disorder. These studies suggest that difficulties with peer relations during childhood can continue to have an impact into adulthood.

Other life events

Other life events may also contribute to cognitive vulnerability for social anxiety disorder. For example, marital conflict, including early parental separation or divorce (Chartier et al., 2001; Davidson, Hughes, George & Blazer, 1993), lack of a close relationship with an adult during childhood (Chartier et al., 2001), and long-lasting separation from either parent during childhood (Wittchen, Stein, & Kessler, 1999) have all been associated with the development of social anxiety disorder.

Magee (1999) explored the influence of traumatic life events on the development of social anxiety disorder using data from the NCS. The onset of social anxiety disorder before the age of twelve in females was associated with rape and/or molestation by a relative. Chartier et al. (2001) also found a relationship between childhood sexual and physical abuse and incidence of social anxiety disorder. Magee (1999) suggests that because some perpetrators of rape or molestation blame their victims, people who have this type of experience might develop a more generalized fear of being criticized by others. While Magee did not find that parental divorce increased the odds of an individual developing social anxiety disorder (in contrast to the findings of Davidson et al., 1993), the onset of social anxiety disorder was strongly associated with verbal aggression between respondents' parents. Magee suggests that observing verbal aggression between parents can also be related to the development of generalized fears of being criticized by others. Watching one's own parents be verbally aggressive toward one another might suggest to a child that social relationships – even between people who are supposed to love one another – can be characterized by intense criticism and instability.

Various studies have also reported a link between the presence of psychopathology in parents and the development of social anxiety disorder in offspring (Chartier et al., 2001; Davidson et al., 1993; Wittchen et al., 1999). Lieb et al. (2000) explored this issue in greater detail, using data that was collected from over 1000 community adolescents. As suggested by research reviewed earlier, children of parents with social anxiety disorder were significantly more likely to also have social anxiety disorder than were children whose parents did not have the disorder. While the presence of social anxiety disorder in the parent was the *best* predictor of social anxiety disorder in the adolescent, other anxiety disorders, depressive disorders and alcohol use disorders in parents were also associated with social anxiety disorder in their children.

Lieb et al. (2000) also reported that respondents who met criteria for social anxiety disorder were more likely than those who did not meet criteria to describe their parents as overprotective and rejecting. It is interesting to note that the association between parental rejection and adolescents' social anxiety disorder was significantly greater when parents were affected by psychopathology of any kind.

The common thread in these studies seems to be that people who develop social anxiety disorder may be more likely than others to have parents who were unavailable (because of poor mental health or because they actually left the home). In such situations, children may come to blame themselves and may come to see themselves

as unable to establish and maintain positive social relationships. Furthermore, such experiences may lead children to develop the belief that social relationships are tenuous and that any "mis-step" could lead to their dissolution.

Cognitive Factors Associated with Social Anxiety Disorder

Much of the chapter thus far has offered an account of factors that may contribute to the development of cognitive styles that are characteristic of social anxiety disorder. In the current section, we review the available evidence that cognitive factors may play a role in the onset and maintenance of social anxiety disorder. Much of the evidence relating cognitive factors to social anxiety disorder concerns the study of biased information processing. In particular, three kinds of biased information processing – attentional biases, memory biases and judgment biases – have been extensively studied in these disorders, and the literature relevant to these areas will be reviewed.

Attentional Biases in Social Anxiety Disorder

Definitions and Methodology

A commonality shared by various cognitive models of psychopathology is that affected individuals have a "sensitivity to and preoccupation with stimuli in their environment that represent their concern" (Williams, Mathews, & MacLeod, 1996, p. 3). While it is generally adaptive to be vigilant to threat in the world (people are likely to live longer that way!), persons with social anxiety disorder are *hyper*vigilant, looking for potential social catastrophe (and finding it) around every corner. While biased attention of this nature may be the *result* of disorder, it is also possible that these attentional biases play more of a causal or mediational role in the development of social anxiety disorder, as well as in its maintenance.

Two primary tasks have been used to explore attentional biases in the anxiety disorders and in other forms of psychopathology. The most commonly used task is the Stroop (1935) color-naming task. In the original Stroop task, individuals were required to name the color in which a word was printed rather than reading the particular word aloud. Performance on the task was measured by the speed and accuracy in which words were color-named, and the greatest degree of interference with performance was observed when the participant was required to name the color of ink in which the name of a color was printed (e.g., responding with "green" when the word "red" appeared in green ink rather than reading the word "red" aloud).

In a very influential study, Mathews and MacLeod (1985) developed a modified Stroop task in which threat words, rather than color names, were used as stimuli. In this study, anxious patients were slower at color-naming during the modified Stroop task than were non-anxious controls. More importantly, anxious individuals were found to be particularly slow at color-naming words related to threat. Since that time, researchers have developed Stroop tasks that involve disorder-relevant threat cues. In studies of individuals with social anxiety disorder, threatening stimuli are generally of a social or evaluative nature (e.g., boring, foolish, inferior; see Mattia, Heimberg & Hope, 1993). The general assumption underlying the "emotional Stroop" is that individuals will take longer to color-name words which represent threat (or current concern) to them since the content of the word diverts their attention from the color in which the word is printed.

Another task used to assess attentional bias in psychopathology is the visual dot-probe paradigm (MacLeod, Mathews, & Tata, 1986). In this paradigm, participants are presented with a pair of words on a computer screen. The words, generally oriented one above the other, are presented briefly (typically for about 500 ms) and then disappear. Afterwards, a dot (.) is presented in the position previously occupied by one of the words. Participants are to respond as quickly as possible (usually by pressing a key) when the dot first appears on the screen. When a participant's attention is drawn to a word in the top position and the dot is presented in the top position, there may be facilitation of responding. Conversely, when the dot appears in the alternate position, responding may be slowed.

Studies of Stroop Response in Social Anxiety Disorder

As noted above, cognitive theories of anxiety posit that individuals with a specific disorder are highly vigilant to threat in their environment that is related to their specific concerns. In the case of individuals with social anxiety disorder, this "selective attention" should be directed to social threat. A study by Hope, Rapee, Heimberg, and Dombeck (1990) offers support for this hypothesis. In their study, patients with social anxiety disorder and patients with panic disorder were presented with neutral words, social threat-related words (e.g., stupid, embarrassed, boring) and physical threat–related words (e.g., fatal, illness, doctor) using a modified Stroop task. Individuals with social anxiety disorder demonstrated greater response latencies for social threat words than neutral words. However, their response latencies for physical threat words and neutral words did not differ. As would be expected, patients with panic disorder exhibited longer latencies for physical threat words but not social threat words. Two additional studies comparing patients with social anxiety disorder to matched community controls also provide support for the selective attention hypothesis (Lundh & Öst, 1996a; Mattia et al., 1993). In these studies, patients with social anxiety disorder exhibited longer latencies than did control participants on all word types (social threat, physical threat, and matched neutral words), but were particularly slow to respond to social threat words.

Maidenberg, Chen, Craske, Bohn, and Bystritsky (1996) addressed the question of whether selective attention was related specifically to threat or whether attention was drawn to words with a more generally negative valence. Patients with social anxiety disorder, panic disorder, and normal controls completed a modified Stroop task with word stimuli drawn from seven categories: social-threat (e.g., inferior), social-positive (e.g., respected), panic-threat (e.g., gasping), panic-positive (e.g., healthy), general-threat (cancer), general positive (e.g., happy), and neutral (e.g., identical). Among the patients with social anxiety disorder, latencies to color-name the various types of threat words (social, panic, general) did not differ. However, when latencies to color-name threat words were compared to latencies to color-name neutral words, differences emerged only for the social-threat words, with social anxiety disorder patients taking longer to color name the social threat words than neutral words. In contrast, panic disorder patients demonstrated longer latencies for all threat-related words (as compared to neutral words), leading the authors to conclude that social anxiety disorder is characterized by a more specifically focused fear network than that of panic disorder (Maidenberg et al., 1996).

Recently, DiPino and Riskind (2000) tried to determine the specific nature of social-threat words most relevant to shy people and people with social anxiety disorder. In their study, participants with social anxiety disorder, participants who had been classified as shy (but who did not meet criteria for social anxiety disorder) and non-clinical control participants completed a Stroop task that included neutral words and four kinds of affect words – words related to shame, guilt, evaluation, and shyness. While significant group differences did not emerge on the shyness, guilt or evaluation words, participants with social anxiety disorder and participants who were shy showed more interference on shame words (e.g., ashamed, exposed, embarrass, humiliate) than did non-clinical control participants. This is the first study to examine shame and its potential relationship to social anxiety, and further study is warranted.

Finally, it is interesting to note that successful treatment for social anxiety disorder can reduce the interference produced by social threat words in the Stroop color-naming task. In the Mattia et al. (1993) study, patients with social anxiety disorder who responded to a variety of treatments demonstrated a significant reduction in response latency for social threat words following treatment while patients classified as treatment nonresponders did not. The groups did not differ in their responses to physical threat words or color names. Similar findings were reported by Lundh and Öst (2001). While non-responders to CBT continued to show Stroop interference, patients who were deemed treatment responders showed a significant reduction in attentional bias for social treat words.

Studies of Dot-Probe Response in Social Anxiety Disorder

Only one study has employed the classic dot-probe paradigm in the study of social anxiety disorder. Asmundson and Stein (1994) employed the dot-probe task to compare patients with social anxiety disorder to nonanxious control participants by presenting pairs of words that were either both neutral, one neutral/one physical threat or one neutral/one social threat. In addition to viewing the words, participants were asked to read aloud the top word and then to quickly press the space bar for trials in which a dot appeared in the position of either word. Consistent with the selective attention hypothesis, patients with social anxiety disorder responded more rapidly to the presentation of the dot when social threat words were presented in the top position. Patients with social anxiety disorder did not show differences in response rates when physical threat or neutral words appeared in the top position. Furthermore, nonanxious control participants did not differ in their response rates for any pairings of words and dot probes.

Three studies have used a creative variation on the dot-probe paradigm to study attentional biases toward (or away from) different facial expressions. Facial expressions have been used in studies exploring attention and memory biases in social anxiety disorder since these stimuli are viewed as more externally valid than mere words. By definition, people with this disorder are exquisitely sensitive to the feedback that they receive from others and facial expressions are an important way in which that feedback is communicated.

Bradley et al. (1997, experiment 1) explored attentional biases for facial expressions using a modified dot-probe task in a non-clinical sample of participants who had been divided into high and low socially anxious groups according to their scores on the Fear of Negative Evaluation Scale (FNE; Watson & Friend, 1969). Bradley et al. (1997) did not find evidence for a social anxiety-related attentional bias for angry faces. Yet, in a study by Yuen (1994) in which participants were told that they would have to give a speech after completing the dot-probe task, those who scored high on the FNE scale responded more slowly to probes that were presented after negative faces than to probes presented after neutral faces. This bias was not exhibited by participants who scored low on the FNE scale.

In a natural follow-up to these studies, Mansell, Clark, Ehlers and Chen (1999) had participants – half of whom had been told that they would have to make a speech after they had finished the task – complete the modified dot-probe task. While Yuen (1994) only presented participants with negative and neutral faces, Mansell et al. (1999) also included happy faces. In line with Yuen's (1994) findings, highly socially anxious participants reacted

more slowly to probes presented after they had seen negative faces than to probes that were presented after they had seen neutral faces – but only in the social threat condition (i.e., when they expected that they would soon be giving a speech). In the social threat condition, highly socially anxious participants also reacted more slowly to probes presented after they had seen positive faces than to probes that were presented after they had seen neutral faces.

Mansell and colleagues advance some interesting suggestions as to why the attentional bias was demonstrated in reaction to both positive and negative faces. It is possible that *any* emotionally-valenced expression could remind socially anxious individuals that they are being evaluated, leading them to direct their attention elsewhere. They may also misinterpret positive expressions, thinking instead that they are being laughed at, for example. These findings are interesting to interpret in light of findings by Wallace and Alden (1997). These authors found that social success can actually lead to negative emotional states in people with social anxiety disorder because they perceive that others will expect even more of them following success, increasing the likelihood that they will not be able to live up to others' expectations during future interactions.

It is important to mention that the findings of the dot-probe studies that used faces as stimuli seem incongruent with the findings from Stroop tasks and from dot-probe studies that used words as stimuli. Stroop studies, as well as the study using the classical dot-probe paradigm, suggest that attention is directed *toward* threat words. Studies using the modified dot-probe paradigm suggest that attention is directed *away* from emotional faces (as compared to neutral faces). On closer consideration, these patterns need not necessarily be seen as discrepant. In the modified dot-probe studies of facial stimuli, differences in reaction time *did* emerge between neutral and emotional faces. In order for this difference to emerge, participants must have initially attended *to* the faces. Once the facial expressions were perceived as being emotionally-laden, participants may have subsequently diverted their attention. This pattern of findings fits well with what Mogg, Mathews and Weinman (1987) have termed the vigilance-avoidance pattern of cognitive processing. While people who are anxious are vigilant to threat in their environments, they also are motivated to avoid threat, reduce its impact, or to act as if it does not exist.

The vigilance-avoidance pattern of processing could have important implications for the maintenance of social anxiety disorder. At some stage in information processing, people with social anxiety disorder direct their attention away from the facial expressions of others. By not being attuned to the finer points of facial expressions (which is likely if they rapidly divert their attention), people with social anxiety disorder may miss out on positive feedback from others (in the forms of smiles, nods, etc.) or, at least, the opportunity to learn that these pleasant expression are not harbingers of future negative outcomes. Their beliefs about their lack of ability in social situations might therefore be perpetuated. Furthermore, by turning away from facial expressions, people with social anxiety disorder might miss out on important social cues, making it more likely that they will come across as less socially skilled than others. This too can serve to perpetuate social anxiety over time, since individuals with the disorder might actually have negative social interactions with others, serving to confirm their beliefs that they lack the ability to successfully negotiate social situations.

Studies Using Alternative Methodologies to Explore Attentional Bias in Social Anxiety Disorder

Researchers using other paradigms have also recognized the importance of studying reactions to facial expressions among people with social anxiety disorder. Gilboa-Schechtman, Foa, and Amir (1999) made use of a "face-in-the-crowd" paradigm to explore attentional biases for faces in social anxiety disorder. In their study, participants with social anxiety disorder and non-clinical controls were shown arrays of faces. On some trials, all of the faces in the crowd shared the same expression (neutral, happy or angry), and on other trials, one face in the crowd exhibited a different emotional expression (neutral, angry, happy or disgust) than the rest of the group. Participants were asked to indicate whether there was a discrepant face in each array that they were shown.

All participants were quicker at finding an angry face in a crowd of neutral faces than they were at finding a happy face in a crowd of neutral faces. However, this discrepancy was more pronounced in individuals with social anxiety disorder. This task took longer when participants with social anxiety disorder were exposed to happy or angry crowds than when they were exposed to neutral crowds. Explanations for this pattern of findings were similar to those advanced for the findings in Mansell et al. (1999). It is possible that people with social anxiety disorder are sensitive to emotional reactions of *any* type in others and it is also possible that people with the disorder view even positive faces in a negative way (e.g., a smile actually means that someone is laughing at you).

At a quick glance, the findings from Gilboa-Schechtman et al. (1999) seem to be in contrast to those of Mansell et al. (1999) in that the latter study found that socially anxious people diverted their attention *away* from emotional faces, while the former study found that people with social anxiety disorder directed their attention *toward* emotional faces. Yet, as noted above, in the Mansell et al. (1999) study, it seems that participants must have initially directed their attention toward the faces, identified the expressions, and subsequently diverted their attention when they saw that the faces were of an emotional nature. That Mansell et al. (1999) used more real-life stimuli than Gilboa-Schechtman et al. (1999) supports this argument.

In a study with better external validity than most, Veljaca and Rapee (1998) asked participants who had scored either high or low on a measure of social anxiety to give a speech to an audience of confederates who had been trained to engage in an equal number of positive (e.g., leaning forward) and negative (e.g., yawning) feedback behaviors, many of which included facial feedback of some sort. While participants low in social anxiety detected more positive feedback behaviors than negative feedback behaviors from audience members, participants high in social anxiety showed the opposite effect.

Finally, in a unique study using words as stimuli, Amir, Foa and Coles (1998b) used a homograph paradigm (a homograph is a word with multiple meanings) to study attentional bias in individuals with social anxiety disorder. In this paradigm, participants are presented with a sentence that is then followed by a word. Participants must decide if this word is related to the sentence that they had just seen. In Amir et al.'s study, the word that followed each sentence was presented either at a very short delay or at a longer delay in an effort to study the sequence of vigilance and avoidance hypothesized by Mogg et al. (1987).

Two types of sentences were used for the critical trials in their study. Half of the sentences ended in a non-homograph and the word following the sentence was a social threat word (e.g., She cut off the string. ABANDON). The other half of the sentences ended in a homograph and the stimulus word following the sentence implied the socially threatening meaning of the homograph but did not fit the meaning of the sentence (e.g., She wrote down the mean. UNFRIENDLY). It was assumed that the threatening meaning of homograph had been activated if participants took longer to respond to social threat words following sentences ending in homographs than those ending in non-homographs.

Significant results did in fact emerge for the sentences ending in socially relevant homographs. When words followed sentences at a short delay, people with social anxiety disorder showed more interference than they did after a long-delay; non-clinical controls did not show this effect. Amir et al. (1998b) interpreted these findings in terms of Mogg et al.'s vigilance-avoidance notion. It might be that cues in the environment (like the socially-relevant homographs) can immediately activate threat-relevant information in anxious people. Yet, given that this type of information is aversive, they may be motivated to shift their attention away from it. The longer delay between the sentence and the word in Amir et al.'s study might have permitted participants to do just that.

In summary, numerous tasks have been employed to explore the general hypothesis that people with social anxiety disorder selectively attend to social threat in their environments. Although the findings are often complex, they generally support this contention. It seems that people who are socially anxious have a natural tendency to attend to threat in their environments. However, once they have noticed threat (or what they *perceive* to be threatening), they may be motivated to divert attention away from it. This tendency to divert attention away from socially-relevant information (be it truly threatening or just perceived as such) may be very important to understanding the etiology and maintenance of social anxiety disorder.

Memory Bias in Social Anxiety Disorder

Definitions and Methodology

Researchers interested in memory biases distinguish between implicit memory and explicit memory. According to Schacter (1987), explicit memory is the form of memory demonstrated when someone attempts to learn new material and makes a specific effort to recall that material. Explicit memory requires conscious and effortful recollection of previous experiences. In contrast, implicit memory is the learning that takes place naturally in the course of everyday life. The person does not set out specifically to learn something, but his/her performance indicates that learning has indeed taken place.

Tests of implicit and explicit memory generally occur in two phases (see Roediger & McDermott, 1993). In the first phase, experimental participants are presented with test stimuli, generally words or pictures. In the second phase, task demands differ depending on the type of memory being assessed. Explicit memory tasks typically involve recall or recognition. In recall tasks, for example, participants might be asked to list the words that they had previously rehearsed. In recognition tasks, they might simply indicate whether or not they had seen a particular word or picture during the first phase of the task – in other words, they must distinguish stimuli they had already seen from novel stimuli presented for the first time. Explicit memory biases would be said to have occurred if the person recalls more threatening words than words of other sorts, endorses more threat words than neutral words in a recognition test, or if this tendency were noted in patients but not in normal control participants.

In implicit memory tasks, participants are not instructed to rehearse material or led to believe that they will be tested on it later. Rather, they are led to believe that they are completing a task unrelated to the first phase of the study. For example, participants might be given word stems and be asked to complete the stems with the first word that comes to mind. The assumption is that participants will be more adept at completing stems of words that they had previously studied than words that were not on the original stimuli list – this facilitation is referred to as "priming" (see Schacter, 1987). Implicit memory biases would be demonstrated if more word stems were

completed with previously seen threat words than with previously seen neutral words or if this tendency were noted in patients but not in normal control participants.

Studies of Memory Bias in Social Anxiety Disorder

It is clear that people who have difficulties with social anxiety selectively attend to social threat in their environments (although after having initially attended to threat, they might then direct their attention away from it). The literature on memory biases in social anxiety disorder is less clear-cut than the literature on attentional biases. Some studies have suggested that memory biases in social anxiety disorder do not exist. Rapee, McCallum, Melville, Ravenscroft, and Rodney (1994) ran four studies exploring both implicit and explicit memory biases in individuals with social anxiety disorder. Their studies involved both standard laboratory tasks (recall and recognition of social threat words as compared to physical threat words, positive words and neutral words) and tasks with relevance to situations that are difficult for people with social anxiety disorder (memory for feedback on a public speaking task). None of the studies in Rapee et al.'s (1994) report showed any sort of memory bias in people with social anxiety disorder. Lundh and Öst (1997) also failed to find evidence of implicit or explicit memory biases in people with social anxiety disorder.

Other studies have shown evidence of memory biases among patients with social anxiety disorder, with some demonstrating impaired memory and others demonstrating enhanced memory for information relevant to social threat. Wenzel and Holt (2002) found evidence for memory impairments in a study in which patients with social anxiety disorder and non-clinical control participants were presented with prose passages – some relevant to evaluative threat and some neutral in content. Participants were asked to complete free recall tasks immediately after reading each passage. Patients with social anxiety disorder actually remembered less information from the passages pertaining to evaluative threat than did the non-clinical controls. The authors interpreted their findings in the context of vigilance-avoidance theory, proposing that patients with social anxiety disorder avoided content that was of a threatening nature to them. Other studies, however, have shown evidence of enhanced memory for social-threat relevant information among patients with social anxiety disorder. Amir, Foa and Coles (2000) found evidence for an implicit memory bias in the disorder using the white-noise judgment paradigm (Jacoby, Allan, Collins & Larwill, 1988). This task was developed to reduce the influence of explicit memory processes on tasks meant to measure implicit memory. Participants in this study were asked to listen to and then repeat neutral sentences and social-threat related sentences. During the test phase, participants were presented with the sentences that they had heard before ("old") and with novel sentences ("new"), all of which were masked by white noise at variable volumes. Participants were then asked to rate the level of noise masking each sentence. Ratings of lower noise volume for old sentences than for new sentences have been taken as indicative of implicit memory (Jacoby et al., 1988), and, if this pattern were to occur specifically for socially threatening sentences among persons with social anxiety disorder, then an implicit memory bias would be demonstrated. While non-clinical controls did not rate the noise volume of old and new sentences differently, people with social anxiety disorder did make lower noise ratings for old social-threat sentences than for novel social-threat sentences, providing support for an implicit memory bias.

In line with the research on attentional biases, some researchers have explored memory for faces in people with social anxiety disorder. In a study by Lundh and Öst (1996b), participants with social anxiety disorder and non-clinical controls were presented with a series of faces and were asked to rate them as critical or accepting. Participants were subsequently presented with a larger set of faces (half of which they had rated and half of which they had never seen) and were asked to indicate if they recognized each face. While participants with social anxiety disorder and normal control participants did not differ in their judgments of faces as either critical or accepting, participants with social anxiety disorder were better than normal control participants at recognizing the faces that they had rated as critical. In contrast, normal control participants showed a trend towards recognizing more of the faces that they had classified as accepting. It is interesting to note that this memory bias for critical faces seems to be unique to social anxiety disorder. In a study by Lundh, Thulin, Czyzykow and Öst (1998), participants with panic disorder did not show a memory bias for faces that they had rated as critical, but rather, showed a memory bias for faces that they had rated as safe – a more relevant concern for people with panic disorder.

In Foa, Gilboa-Schechtman, Amir, and Freshman (2000, Experiment 1), participants with social anxiety disorder were shown pictures of a series of people and were asked to learn each person's name. They were then presented with an encoding task in which they were asked to state the facial expression (happy, angry or neutral) that each person exhibited. Subsequent to these learning and encoding tasks, participants performed a free recall task that involved listing the names of the people they had just seen and indicating the facial expression that each person had exhibited. People with social anxiety disorder performed better on the free recall task than did non-clinical controls. That is, individuals with social anxiety disorder were *better* than non-clinical controls at remembering the names of the persons they had seen earlier in the study and were better at correctly recalling the

facial expression that each person had exhibited. This pattern supports the idea that socially anxious persons attend to others' facial expressions before diverting their attention.

Participants in Foa et al.'s (2000) Experiment 1 also performed a cued recall task in which they were given a list of names and asked to indicate which expression each person had exhibited during the second phase of the study. All participants showed better recall of happy faces than of neutral or angry faces – which did not support the hypothesis that people with social anxiety disorder would show enhanced memory for angry faces. On the cued recall task, people with social anxiety disorder again performed better than non-clinical controls, and as in the free recall task, all participants recalled happy faces better than angry or neutral faces. Yet, people with social anxiety disorder were found to recall angry expressions better than did non-clinical control participants.

In Foa et al.'s (2000) Experiment 2, individuals with social anxiety disorder and non-clinical controls were shown faces with neutral, happy, angry or disgust expressions. Later, these faces were interspersed with faces that the participants had not seen before, and they had to indicate whether the faces were "new" or "old." In this study, participants with social anxiety disorder were better at recognizing old faces than were non-clinical controls and, furthermore, the clinical group was better at recognizing old negative facial expressions (anger and disgust) than they were at recognizing old non-negative facial expressions.

In a similar task, Mansell et al. (1999) assessed recognition for faces that were used in the dot-probe task discussed above. After completing the dot-probe task, participants were presented with a number of faces (half of which had been used in the dot-probe task) and were asked to indicate which faces they had seen before. Low socially anxious participants did not show a recognition bias. High socially anxious participants did show a bias, which differed depending on the threat condition to which they were assigned. Participants who were under high threat were more likely to recognize *any* emotional face (positive or negative) as compared to neutral faces, but those who were not under threat were actually more likely to recognize neutral faces.

Data inconsistent with other studies of memory for facial expressions among individuals with social anxiety disorder were presented by Pérez-López and Woody (2001). Patients with social anxiety disorder and non-clinical controls were told that they would be giving a speech and were then shown photos of individuals who might be in the audience. In the photos, individuals exhibited threatening or reassuring facial expressions. After the encoding task, participants were given three minutes to prepare their speeches and were then presented with two side-by-side photos of each individual they had originally seen. In one photo the person exhibited a threatening facial expression and in the other, the person exhibited a reassuring facial expression; participants were asked to select which face they had seen during the encoding task. Contrary to expectations, patients with social anxiety disorder were less skilled than non-clinical control participants at recognizing previously seen faces and although both groups showed a small bias in favor of remembering accepting faces, the bias index was only significant for patients with social anxiety disorder. These results were mediated by the level of state anxiety experienced by participants in anticipation of making their speeches. In other words, by focusing on the upcoming speech task, patients with social anxiety disorder might have been less able to encode information about the pictures that they had seen. This does not explain the bias in favor of remembering accepting faces; the authors point out though that this bias was quite small and was measured with an index that has limited utility.

In summary, the evidence for memory biases in social anxiety disorder is mixed. While there is some evidence for enhanced memory for information relevant to social threat, other studies failed to find any evidence of memory bias and one study actually showed impaired memory for such information. The range of methodologies used to explore the issue of memory bias might be a factor in these inconsistencies, suggesting that further research is required. It is quite likely that memory for social-threat related information is at times enhanced and at times impaired; further research might be able to uncover the factors that lead to these divergent outcomes.

There is slightly stronger evidence to suggest that a bias might exist for memory of faces. The studies that have explored this issue have shown, for the most part, that people with social anxiety disorder remember emotional faces (particularly when they are negative) better than neutral faces. This finding has important implications in terms of cognitive vulnerability for social anxiety disorder. If people come away from social situations remembering only the (real or perceived) critical people that they have encountered, this might facilitate future avoidance and perpetuate the cycle of social avoidance and distress.

Although not specifically a memory bias, it is interesting to note that a number of studies show that memory for non-socially threatening information may be disrupted in people with social anxiety disorder. Hope, Heimberg, and Klein (1990) asked female college students who had been classified as being high or low on social anxiety to interact with a male confederate. They were later asked to recall aspects of the interaction. Participants who scored high on the measure of social anxiety recalled less information (e.g., interests, appearance, background) about the male conversation partner and were more prone to make errors in their recall than were participants who scored low on the measure of social anxiety. In a subsequent study, Hope, Sigler, Penn, and Meier (1998) were not

able to entirely replicate the earlier findings; however, socially anxious females did make more recall errors. Other studies with non-clinical samples show similar findings (e.g., Bond & Omar, 1990; Daly, Vangelisti, & Lawrence, 1989; Kimble & Zehr, 1982).

These findings fit very nicely with recent research on focus of attention in social anxiety disorder. When socially anxious individuals find themselves in stressful social situations, their attention is focused inward on themselves and on how they believe that they are coming across to others, rather than on the social situation at hand (e.g., Hackmann, Surawy, & Clark, 1998; Wells, Clark, & Ahmad, 1998; Wells & Papageorgiou, 1999). This shift in focus of attention has an impact on individuals with social anxiety disorder when they are in social situations, but also impacts on how they recall social situations once they are over. When imagining or remembering themselves in social situations, some people take an "observer perspective," seeing themselves as they imagine that others see them (almost as if viewing themselves on videotape); others, take a "field perspective" in which people recall situations as viewed through their own eyes. Coles, Turk, Heimberg, and Fresco (2001) found that as the degree of anxiety associated with memories of social/performance situations increased, people with social anxiety disorder were more and more likely to take an observer perspective, while non-clinical controls were slightly more likely to take a field perspective. Furthermore, as the anxiety associated with these social memories increased, people with social anxiety disorder rated their behavior during the situations more negatively.

The excessive attention to how one is coming across to others (and to how one did come across to others, once social situations are over) has important implications for cognitive vulnerability to social anxiety disorder. By focusing attention on the self, rather than outward on the situation at hand, individuals with social anxiety disorder might come across to others as less socially skilled (e.g., not being able to follow the conversation, forgetting a person's name whom they have met many times, etc.), increasing the likelihood that they will receive negative feedback or be rejected by others. In addition, self-focused attention precludes socially anxious individuals from picking up on positive cues from others that might serve to *disconfirm* their beliefs. Because their focus is inward, they miss out on this important information and therefore judge the outcome of social situations on how they *felt* when they were in them, rather than on what actually occurred. This is clearly demonstrated in the Coles et al. (2001) study – when patients *felt* more anxious in social situations, they assumed that their performance was poorer. Coming away from social situations with biased data (overemphasis on the negative and missing out on the positive) could be important to both the onset and maintenance of social anxiety disorder. Furthermore, as already noted, being inwardly self-focused can actually lead to social impairments, which might also contribute to the onset and maintenance of the disorder.

Judgment and Interpretation Biases in Social Anxiety Disorder

A major factor implicated in the maintenance of social anxiety disorder is the fact that people with the disorder avoid social situations, often denying themselves the chance to learn that these situations are not as threatening as they perceive them to be. Studies of judgment and interpretation biases help us to understand the motivation behind this avoidance. First, socially anxious people tend to be harsh critics of their own social behavior. Following from this, it should come as no surprise that people who have difficulties with social anxiety expect negative outcomes in the social situations in which they find themselves. Further increasing the likelihood of avoidance, socially anxious people also perceive that they have little control over outcomes in their lives.

Judgments about the Self in Social Situations

Numerous studies have demonstrated that socially anxious people are their own worst critics. These studies typically place participants in a "mock" social situation and ask them to rate their own social behavior once the situation is over. Other participants in these mock social situations (usually experimental confederates) and/or objective observers are also asked to make similar ratings, allowing for a comparison between how socially anxious people judge themselves and how they are judged by others.

In a study by Stopa and Clark (1993), individuals with social anxiety disorder and non-anxious controls participated in a "get-acquainted" task with an experimental confederate. Participants were asked to rate their own social behavior, and tapes of the interaction were also rated at a later date by objective observers. As compared to non-clinical controls, participants with social anxiety disorder were rated higher on negative dimensions of social behavior (e.g., blushing, shaking, leaving gaps in the conversation) and lower on positive dimensions of social behavior (e.g., asking interesting questions, appearing socially competent, etc.) as assessed both by self-ratings and by ratings made by the observer. Of particular relevance, however, was the discrepancy between self-ratings and observer ratings. Participants in the social anxiety disorder group gave themselves significantly higher ratings on negative social behaviors and significantly lower ratings on positive social behaviors as compared to ratings made by the observer. In contrast, while non-clinical controls rated themselves somewhat lower on positive social behaviors than did the observer, self and observer ratings did not differ on negative social behaviors.

Alden and Wallace (1995) also used a "get-acquainted" task in which participants with social anxiety

disorder and non-anxious controls interacted with a confederate who had been instructed to behave either positively or negatively toward the participant. Following the interaction, participants were asked to rate their own social behavior and were also rated by the confederate. As compared to ratings made by the confederate, people with social anxiety disorder rated themselves as less interesting and less likeable in both positive and negative interactions.

Other studies have made use of a speech task in which participants are asked to make a speech and are then rated by both themselves and by objective observers. Rapee and Lim (1992) asked people with social anxiety disorder and non-clinical controls to make a speech in the presence of other study participants. Each person rated his or her own performance and was also rated by the other participants. While all participants (regardless of diagnosis) were more critical of themselves than others were of them, this was particularly true for people with social anxiety disorder. A similar finding was reported by Rapee and Hayman (1996).

People with social anxiety disorder also seem to differ from people without the disorder in terms of how they think that others interpret symptoms that are typically associated with anxiety such as blushing, shaking, or sweating. Roth, Antony and Swinson (2001) reported that while non-clinical controls assume that others will interpret these symptoms as being indicative of some normal physical state like being hot or cold or tired, people with social anxiety disorder assume that others will interpret these symptoms as being indicative of an intense anxiety problem or some other psychiatric disorder. Going into social situations with this type of expectation most likely contributes to the tendency of people with social anxiety disorder to selectively attend to negative reactions from others. As already noted, this type of expectation precludes people with the disorder from noticing positive feedback in the environment and might also serve as a distraction, increasing the likelihood of real difficulties in the social arena.

It is interesting to reiterate at this point that people with social anxiety disorder take an observer perspective when viewing their own social behavior, that is, they tend to view themselves as if through the eyes of another person. This is a hallmark of cognitive models of social anxiety disorder and has also been demonstrated empirically in the literature (e.g., Hackmann et al., 1998). With this in mind, we can interpret the self-ratings made in these studies as measures of how people with social anxiety disorder assume they are viewed by others. Since they assume that they are viewed much worse than they really are and because they do little to gather discomfirmatory data, this tendency should perpetuate social avoidance and distress over time.

Judgments about the Social World

We have established above that people with social anxiety disorder tend to judge themselves quite harshly in social situations. It should then come as no surprise that people with the disorder tend to expect negative outcomes in social situations. Lucock and Salkovskis (1988) first explored this issue, comparing patients with social anxiety disorder to matched control participants on the likelihoods they assigned to negative social and negative nonsocial events. Untreated patients with social anxiety disorder assigned a higher likelihood to a negative social event than did control participants. The two groups did not differ on the likelihood that negative nonsocial events would occur. Following treatment with cognitive behavior therapy, the patients with social anxiety disorder demonstrated significant improvement in their judgment bias for the likelihood of negative social events. Control participants did not repeat the assessment, however, leaving open the possibility that changes in the rated likelihood of negative social events were the result of repeated assessment rather than treatment.

Foa, Franklin, Perry, and Herbert (1996) replicated and extended the findings of Lucock and Salkovskis (1988) by comparing a sample of patients with social anxiety disorder to nonanxious controls. In this study, participants were also asked to assess the cost associated with negative events in addition to the likelihood of their occurrence. Nonanxious participants also repeated the task concurrent in time with the end of treatment for the patients with social anxiety disorder to control for repeated assessment and the passage of time. The findings of this study correspond favorably to those of Lucock and Salkovskis (1988). Untreated patients with social anxiety disorder were more likely than nonanxious participants to assign greater likelihoods to negative social events and to see their impact as being more costly. The groups did not differ in their likelihood and cost estimates for negative nonsocial events. Following cognitive-behavioral treatment, estimates of likelihood and cost were attenuated for the patients with social anxiety disorder. While drops in cost estimates were more related to improvement than changes in probability estimates, this finding was not replicated in a recent study by McManus, Clark and Hackmann (2000).

Gilboa-Schechtman, Franklin, and Foa (2000) extended these findings by presenting patients with social anxiety disorder with both negative and positive social events. Participants were asked to rate the probability that each event would happen to them and were also presented with questions about their reactions to each event. As compared to non-clinical controls, patients with social anxiety disorder estimated that positive social events were less likely and that negative social events were more likely. Furthermore, they associated a greater impact and more negative reactions to both positive and negative social events.

In two recently completed studies, participants were presented with ambiguous social situations (e.g., not obviously positively or negatively valenced) in an effort to identify a possible interpretation bias in social anxiety disorder. In Amir et al. (1998a), patients with social anxiety disorder, patients with obsessive-compulsive disorder (OCD) and nonanxious control participants were asked to consider a series of social and nonsocial scenarios. Participants were asked to rank order the likelihood that a positive, a neutral, and a negative outcome for each scenario would occur. As compared to patients with OCD and non-anxious controls, patients with social anxiety disorder were more likely to select the negative interpretation for social situations even when positive and neutral interpretations were available. The three groups did not differ in their interpretation of nonsocial events.

Stopa and Clark (2000) conducted a study similar to that of Amir et al. (1998a), comparing patients with social anxiety disorder to patients with any other anxiety disorder. In addition to rating ambiguous situations, participants were also asked to consider the meaning of mildly negative social events (e.g., "You've been talking to someone for a while and it becomes clear that they're not really interested in what you are saying."). Patients with social anxiety disorder were more likely than patients with other anxiety disorders to interpret ambiguous social situations as negative. They were also more likely than anxious controls to interpret the mildly negative social situations in catastrophic terms.

Not only do people with social anxiety disorder expect negative outcomes for themselves in social situations, but they also attribute outcomes in their lives to causes over which they have little control. Informed by research on attributional styles in depression (Abramson, Seligman & Teasdale, 1978), Heimberg et al. (1989) gave a slightly modified version of the Attributional Styles Questionnaire (Peterson et al., 1982) to people with social anxiety disorder, other anxiety disorders, and depression. As compared to non-clinical controls, people with social anxiety disorder exhibited a more internal, global and stable attributional style for negative events, quite similar to that exhibited by the depressed group. This attributional style suggests that people with social anxiety disorder attribute a great deal of responsibility for negative outcomes to unchangeable negative aspects of themselves. Two further studies (Cloitre, Heimberg, Liebowitz, & Gitow, 1992; Leung & Heimberg, 1996) shed additional light on the ways in which persons with social anxiety disorder explain the outcomes of events. In the study by Cloitre et al. (1992), patients with social anxiety disorder, patients with panic disorder and normal controls completed a measure of locus of control. Both groups of anxiety disordered patients endorsed causes beyond their control more frequently than control participants. However, the patients differed in the nature of the causes of events in their lives. Panic patients attributed outcomes to chance, a finding that seems consistent with their concern about attacks of physiological symptoms that appear to come out of nowhere. Socially anxious patients, in contrast, viewed "powerful others" as controlling the outcomes of events. It seems that socially anxious persons do believe in an orderly and controllable world; they just believe someone else is at the switch!

These findings fit nicely with our knowledge about avoidance in persons with social anxiety disorder. While they avoid social situations because they want to avoid feeling "bad", their attributional style likely also plays an important role. Simply put, people with social anxiety disorder might avoid social situations because they see negative outcomes as inevitable regardless of their efforts to have an impact on the situation. Because of their avoidance, they never learn that they have more control over outcomes in their life than they think they do.

Conclusions and Future Directions

A definite strength of the research on social anxiety disorder has been the development of cognitive models for the disorder (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997). While these models focus on factors that *maintain* the disorder, they put less emphasis on the *etiology* or *development* of the disorder. Because cognitive models of social anxiety disorder have been informed by cognitive-behavioral therapy for the disorder, and have in turn, helped to improve therapy for the disorder, etiology has not been emphasized. After all, cognitive-behavioral therapy is effective regardless of whether or not patients have a clear understanding of the origins of their disorder. Yet, efforts to prevent the development of a psychological disorder develop from knowledge of its root causes.

As has been the case in research on depression, a diathesis-stress approach may be useful for organizing the distal factors that may contribute to the later development of social anxiety disorder. In terms of stressors, we have reviewed literature that suggests that certain negative events may contribute to the later onset of social anxiety disorder. Specifically, factors relating to parenting styles, family functioning, and peer relations may influence the way that children come to see their social world and their ability to succeed therein. In terms of diatheses, the focus in social anxiety disorder has been different than it has been in research on mood disorders. Researchers in social anxiety disorder have focused most on the role that early temperament – specifically, behavioral inhibition to the unfamiliar – may play in the way that people come to experience their world. Although researchers have explored attributional style in people who *currently* have social anxiety disorder, this factor has yet to be explored downstream from the actual occurrence of social anxiety symptoms. It would be fruitful to employ longitudinal research methods to explore how specific negative life events and a negative attributional style eventually interact in

the development of social anxiety disorder. It remains unclear whether attributional style develops first, influencing perceptions of negative life events, whether negative life events lead people to develop specific attributional styles, or whether other variables are involved as well. Understanding the nature of this effect seems important in terms of both treatment and prevention.

In terms of more proximal influences that might result in the expression of social anxiety disorder, we have focused here on biases in attention, memory and interpretation of social stimuli. Again, these studies have examined individuals who currently *have* social anxiety disorder. People with social anxiety disorder are hypervigilant to social threat in their environments. They seem particularly likely to notice socially-relevant information, to interpret it as threatening or dangerous. and in some situations, to then divert their attention away from it. This diversion of attention from socially-relevant information may subserve the maintenance of social anxiety disorder by preventing people from attending to positive social cues that could serve to disconfirm their negative beliefs about their abilities in social situations. It may also lead to real impairments in social performance, serving to confirm and strengthen these negative beliefs. It comes as no surprise that people with social anxiety disorder expect negative outcomes in social situations and view their own social performance in a negative way, even though it is not always perceived that way by others.

When in the life of the socially anxious person do these biases become evident? Do they exist before a person actually develops problematic social anxiety? Or, are these biases actually symptoms of the disorder itself? These questions require empirical investigation. Longitudinal studies are the essential next step in understanding the causal sequence of events that leads a person who experiences negative life events to actually develop a disorder.

A study by Schwartz, Snidman, and Kagan (1996) is an example of a "good start" in exploring some of these "links." As noted earlier in this chapter, there seems to be a connection between behavioral inhibition in infancy/childhood and the later development of social anxiety disorder. Schwartz et al. (1996) had adolescent participants who had been classified as behaviorally inhibited or uninhibited 11 years earlier complete a Stroop task that included physical threat words, social threat words, positive words and neutral words. Although their results were quite complex, it appears that the responses of behaviorally inhibited adolescents (as classified 11 years earlier) included a greater proportion of words with threatening content than the responses of adolescents who had been classified as uninhibited. Although these inhibited teens had not yet been diagnosed with particular disorders, they exhibited response styles that one would expect to see in anxiety disordered adults. It would be interesting to look at this same sample again in a few years' time and see if these response styles were predictive of the later development of anxiety disorders. If so, we would have evidence showing a progression from an early temperamental style to later cognitive styles and to still later anxiety disorder.

In conclusion, it will be worthwhile to establish causal models for the development and etiology of social anxiety disorder. In terms of distal factors, researchers should continue to explore negative life events that seem to be tied to the upstream development of social anxiety disorder, while also gaining a clearer understanding of the vulnerabilities (e.g., behavioral inhibition, attributional style) that might influence the way that we perceive these events. Further along the course of events, it will be important to see how cognitive styles change over time and whether indeed, there is a culmination of sorts in that people who develop social anxiety disorder first develop an extreme concern about negative evaluation from others. Understanding these causal links will be very helpful in preventing or containing social anxiety disorder before it begins to have a negative impact on people's quality of life.

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