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Representations of the Self in Social Phobia: Vulnerability to Social Threat

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Abstract
A revised Stroop color-naming task was used to test hypotheses derived from Beck's cognitive theory of anxiety disorders which proposes that social phobics are hypervigilant to social-evaluative threat cues. Color-naming latencies for social and physical threat words were compared to matched neutral words for both social phobics and individuals with panic disorder. As predicted, social phobics showed longer latencies for social threat words, and panickers had longer latencies for physical threat words. Latency for color-naming social threat words correlated with self-reported avoidance among social phobics. These results are consistent with Beck's notion of self-schemata which facilitate the processing of threat cues. Methodological issues and clinical implications are discussed.

Keywords: social phobia, information processing, cognitive assessment, stroop task, social anxiety

Beck has described anxiety disorders as "hypersensitive alarm systems . . . sensitive to any stimuli that might be taken as indicating imminent disaster or harm" (Beck & Emery, 1985, p. 31). This hypersensitivity is characterized by a style of cognitive processing, known as the *vulnerability mode*, which facilitates the processing of danger or threat cues. The vulnerability mode is an organization of cognitive structures called *schemata*, formulae, or rules based on experience which "orient the individual to a situation and help him [or her] to select relevant details from the environment and to recall relevant data" (p. 54). According to Beck, the schemata of anxiety-disordered individuals are dysfunctional in that they are *hypersensitive* to threat cues and *hyposensitive* to safety cues.

For social phobics, the vulnerability mode becomes active in social situations. Their schemata define them as defective or lacking the resources to meet social demands. Social situations are construed as challenges or confrontations in which they are at risk for revealing signs of vulnerability or weakness. Schematic hypersensitivity to threat cues may protect the vulnerable self from the perceived landmines of social interaction. However, social phobics' self-schemata overestimate their vulnerability and confirm their expectations of negative evaluation.

Thus Beck hypothesizes that vulnerability to negative evaluation is the primary construct in social phobics' cognitive representation of themselves in social situations. As a result of these self-schemata, social phobics process social information differently from nonphobics. Unfortunately, little research exists on social phobics' information-processing styles. A number of studies do, however, offer indirect support for Beck's proposals.

Several researchers have reported that high social anxiety is associated with a preponderance of negative self-statements (Cacioppo, Merluzzi, & Glass, 1979; Dodge, Hope, Heimberg, & Becker, 1988; Glass, Merluzzi, Biever, & Larsen, 1982). These negative self-statements generally fall into four categories: (1) thoughts of general social inadequacy, (2) concerns with others' awareness of distress, (3) fear of negative evaluation, and (4) preoccupation with arousal or performance (Hartman, 1984). These data are consistent with Beck's hypothesized vulnerability mode. Socially anxious persons' verbal reports suggest that they do construe themselves as probable victims of negative evaluation and as unable to meet the demands of social situations. However, self-statement assessment does not directly test Beck's notion of anxiety schemata because it examines the verbal content of cognitive activity rather than information-processing styles.

The primary function of schemata is to guide the processing of information. Social phobics' self-schemata should facilitate processing aspects of social situations that are schema-consistent. A number of studies suggest that socially anxious individuals do process information in a manner that confirms their view of themselves in social situations. Socially anxious individuals underrate their performance in social interactions, although they are able to make accurate ratings of others' performance (Clark & Arkowitz, 1975). They recall an excess of negative feedback (O'Banion & Arkowitz, 1977) and view feedback as more negative than nonanxious individuals (Smith & Sarason, 1975).

Schemata may also disrupt the processing of discrepant or irrelevant information. Some aspects of social interactions not essential for evaluating vulnerability, such as information about the interaction partner, may be screened out by socially anxious individuals. Socially anxious subjects do not show a preference for similar over dissimilar interaction partners (Heimberg, Acerra, & Holstein, 1985), a phenomenon that has been repeatedly demonstrated in nonanxious subjects (Byrne, 1971). They also recall fewer of their partner's self-disclosures than nonanxious subjects following a heterosocial interaction (Hope, Heimberg, & Klein, 1990). Although information about the interaction partner may not be essential to evaluating one's own social performance, this processing strategy may put socially anxious individuals at a disadvantage during social interactions and increase the probability that their fears of negative evaluation may become a reality (Heimberg, Acerra, & Holstein, 1985; Hope et al., 1990).

Three studies provide more direct evaluation of the social information-processing strategies of socially anxious college students. Goldfried and colleagues (Goldfried, Padawer, & Robins, 1984) asked socially anxious and nonanxious men to sort social situations into categories. Anxious men utilized the dimension "chance of being evaluated" but nonanxious men sorted situations on the dimensions of "intimacy" and "academic relevance." In a follow-up study (Robins, 1987), socially anxious subjects rated social situations as more risky and uncomfortable than nonanxious subjects. However, they utilized the dimension of intimacy more than nonanxious subjects in sorting situations. Robins suggested that this difference from the earlier study was a reflection of differences in stimulus materials but also noted that differences across situations in intimacy may be very important to socially anxious persons since they may determine the behaviors a person may expect to (or be expected to) perform.

The third study to directly examine information-processing used a depth of processing paradigm. Socially anxious and nonanxious subjects rated lists of adjectives on whether or not another person would use the adjective to describe them (Smith, Ingrain, & Brehm, 1983). Anxious subjects recalled more of these descriptive adjectives than nonanxious subjects, but only when anticipating a heterosocial interaction. Superior recall was hypothesized to indicate increased processing of the words which presumably occurred because how one appears to others was schema-relevant for socially anxious subjects awaiting a social interaction. However, greater recall (increased processing) did not occur when subjects were asked to determine whether they would use the words to describe themselves, a nonsocial task and therefore unrelated to schemata which evaluate social threat.

No studies have yet investigated whether clinically severe social anxiety (social phobia) is associated with extensive processing of social threat cues. However, Mathews and MacLeod (1985, 1986; MacLeod, Mathews, & Tata, 1986) have used experimental cognitive methods to demonstrate that subjects with generalized anxiety disorder (GAD) show more extensive processing of threat-related cues than control subjects. Their first study utilized the Stroop (1938) color-naming task. In the original Stroop task, subjects named the ink colors in which either color names or groups of neutral stimuli were written. Stroop demonstrated that subjects' response time was much longer for color names than for neutral stimuli. Although the exact mechanism of the effect is unclear (Dyer, 1973), it appears that increased response latencies are attributable to semantic processing of color-named words, despite instructions to the contrary. In Mathews and MacLeod's version of the task, GAD subjects and normal controls named the ink colors of words related to physical (e.g., disease, fatal) or social (e.g., foolish, criticized) threat or of neutral control words. Normal control subjects produced almost identical response times for threat and neutral words, but GAD subjects were slower on the threat words. The GAD subjects were then divided into two subgroups on the basis of whether they reported primarily physical worries or social worries. All subjects' performance was disrupted by the social threat words, but only those reporting primarily physical worries were disrupted by the physical threat words. It is unlikely that these findings are attributable to the specific methodology employed because Mathews and MacLeod have essentially replicated these findings with a dichotic listening task (MacLeod et al., 1986) and a signal detection task (Mathews & MacLeod, 1986).

Foa and McNally (1986) examined obsessive-compulsives' schemata using a dichotic listening procedure in which subjects repeated (shadowed) a prose passage they heard in their right ear while another passage containing a neutral target word or an individually selected fear word (e.g., urine, feces) was presented to their left ear. Prior to treatment, obsessive-compulsives were more likely to detect the fear word than the neutral word. However, following treatment, detection of the two types of words did not differ. Watts and colleagues (Watts, McKenna, Sharrock, & Trezise, 1986) found similar effects with the Stroop task in spider phobics. Spider phobics' latency to name the ink colors in which spider-related words were written was reduced following desensitization. Both studies suggest that the anxiety-disordered individuals were less hypervigilant to specific threat cues following treatment, thus indicating that the effect is not simply due to greater familiarity with the words.

The studies described above examined the cognitive processes of individuals with generalized anxiety disorder, obsessive-compulsive disorder, and simple phobia of spiders. As noted above, no one has examined whether severely anxious social phobics are hypervigilant to social threat cues in a similar manner. Therefore, we conducted a preliminary evaluation of the cognitive processing of social phobics using a revised version of the Stroop task. If social phobics are characterized by self-schemata which facilitate the processing of social threat cues, they may demonstrate increased color-naming latencies for social threat words compared to neutral words. Secondly, we hypothesized that their schemata would be specific to social threat and that they would not demonstrate increased latencies for other types of threat words. Finally, social phobic schemata should not be present in individuals with another anxiety disorder and, therefore, we predicted that individuals with panic disorder would not have increased latencies for social threat words.

Method

Subjects

Subjects were 16 social phobics and 15 individuals with panic disorder without agoraphobia or with mild agoraphobic avoidance who sought treatment for anxiety at the Center for Stress and Anxiety Disorders, University at Albany, State University of New York. Subjects were interviewed according to the Anxiety Disorders Interview Schedule–Revised (ADIS-R; DiNardo & Barlow, 1988; see DiNardo, O'Brien, Barlow, Waddell, & Blanchard, 1983) which has recently been updated in accordance with revisions in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R; American Psychiatric Association, 1987). Diagnostic interviews were conducted by clinical psychologists or advanced doctoral students. In addition to determining diagnosis, the ADIS-R interviewer also rated each subject on the 0 to 8 Phobic Severity Rating Scale (PSR; Watson & Marks, 1971). Only subjects exhibiting moderate to severe impairment in daily functioning (PSR of 4 or greater) participated in the study. Social phobics ($M = 5.56$, $SD = 0.81$) and panickers ($M = 5.80$, $SD = 0.63$, $t(24) < 1$) did not differ on the PSR.

Procedure

Prior to beginning treatment, subjects completed a revised version of the Stroop color-naming task (Stroop, 1938). As described earlier, the Stroop task involves naming the ink colors in which words are written. For the present study, the procedure was adapted from the one employed by Mathews and MacLeod (1985). Subjects named the ink colors of words or letter groups printed on six cards. We designed two forms (A, B) of the task because we originally intended to administer the task a second time following treatment and wished to control for practice effects. The words and colors utilized appear in Table I. The social threat words were selected to be representative of the self-schemata of social phobics in social situations. Words were chosen which evoked self-descriptive constructs (e.g., inadequate, inferior) or which described social phobics' expectations for their performance in social interactions (e.g., criticized, failure). The physical threat words were selected in a similar manner to reflect the self-schemata of individuals with panic disorder as hypothesized by Beck and Emery (1985). The social and physical threat control words were matched with their respective threat words on number of letters, number of syllables, and frequency of occurrence in the language (Caroll, Davies, & Richman, 1971). Subjects also named the ink colors of color names and groups of five Xs. Presentation order of the six cards and the form to be administered were randomly determined. Before each card, subjects gave ratings of anger, anxiety, and happiness on 0 to 8 Likert-type scales. Although the anxiety rating was of primary interest, the anger and happiness ratings were included to defuse the possible schema-priming effect of self-rating anxiety.

Table I. Stimuli for Forms A and B of the Revised Stroop Color-Naming Task

Color names	Social threat	Social threat control	Physical threat	Physical threat control
		Form A		
pink[a]	embarrassed	specialized	ambulance	firelight
green	stupid	insert	fatal	rayon
black	failure	network	illness	leaning
orange	inferior	obsidian	doctor	upward
blue	boring	metric	insane	defied
		Ink colors used: pink, green, black, orange, blue		
		Form B		
yellow[a]	foolish	portion	hospital	reported
brown	criticized	narratives	disease	lighted
gray	shameful	softened	stroke	sports
red	inadequate	imperative	coffin	purely
purple	ridiculous	democratic	deadly	parent
		Ink colors used: yellow, brown, gray, red, purple		

a. The control card for the color names consisted of groups of 5 Xs (XXXXX).

Materials

Each card consisted of words or letter groups hand-stenciled on 22 in. (56 cm) by 28 in. (71 cm) white poster board. Block letters ½ in. (1.3 cm) high were written with marking pens

(Pentel Color Pens, Fine Point no. S360). The five words appeared randomly on 20 lines. Randomization was done within pairs of lines so that each word appeared twice in two lines. Each word could appear (a) once on each line, or (b) twice on one line (although not sequentially), but not on the other line of the pair. Ink color was randomly assigned to the words in the same manner.

Administration of the Stroop Task

One of two experimenters (DAH or MJD) administered the task using written instructions. The experimenter told the subjects that the task was a measure of how people see events in their environment. They were instructed to name aloud the ink colors in which words were written as quickly and accurately as possible. The experimenter showed subjects a sample card with four neutral words and one color name written in various colors to clarify the procedure. The anger, anxiety, and happiness rating scales were explained, and the experimenter showed subjects a card with five groups of three Zs written in pink, green, black, orange, and blue (Form A) or yellow, brown, gray, red, and purple (Form B). Subjects named the ink colors of the Zs and were informed that these were the only colors they would see on subsequent cards. Finally, subjects were given the opportunity to practice the task. Subjects named the ink colors of five neutral words (once, interval, often, heavy, and desk) on a practice card. The practice card was identical to the other cards with the exception that each word was repeated 10 times rather than 20. Color-naming was timed for the practice card as described below. Once questions were answered, subjects rated their anger, anxiety, and happiness and the first card was presented. The experimenter began timing when the first color name was announced and stopped at the last color name. This procedure was repeated for each of the five remaining cards.

Other Measures

Both social phobics and panickers completed the verbal portion of the Shipley-Institute of Living Scale (Shipley, 1939). The Shipley Scale is a multiple-choice vocabulary test and was used as an estimate of verbal ability.

Social phobics also developed a fear and avoidance hierarchy. The hierarchies consisted of 10 situations which were relevant to the concerns for which subjects sought treatment, and were individually constructed with the aid of the first author. Subjects rank-ordered the 10 situations on the basis of difficulty and then rated each situation on three 0 to 100 scales—*fear* provoked by being in the situation, *avoidance* of the situation, and how concerned the subjects were about negative *evaluation* in the situation. Higher numbers indicate greater fear, more extensive avoidance, and more concern about evaluation. For the purposes of this study, only the five highest ranked situations were used.

Results

Preliminary Analyses

Although the panickers' scores on the vocabulary portion of the Shipley Scale were somewhat more variable ($M = 31.57$, $SD = 5.26$) than those achieved by social phobics ($M = 32.94$, $SD = 2.62$), the two groups did not differ ($t(28) = 1.31$, NS).[1] Mean anxiety ratings also did

not distinguish the two groups (social phobics $M = 2.56$, $SD = 1.97$; panickers $M = 2.64$, $SD = 1.48$; $t(29) < 1$).

Analyses of Color-Naming Latencies

Matched-pairs *t*-tests were used to test the three a priori hypotheses outlined above: (1) social phobics would show greater color-naming latencies for social threat words compared to control words; (2) panickers would show greater color-naming latencies for physical threat words compared to control words: (3) social phobics would not demonstrate increased latencies for physical threat words and panickers would not demonstrate increased latencies for social threat words. As shown in Table II, social phobics took longer to name the ink colors of social threat words ($M = 88.02$, $SD = 17.17$) than of matched control words ($M = 80.30$, $SD = 15.72$; $t(15) = 3.80$, $p < 0.002$). Color-naming latencies for panickers did not distinguish between social threat ($M = 88.21$, $SD = 14.78$) and control words ($M = 84.02$, SD = 14.64; $t(14) = 1.44$, NS). However, the opposite effect was found for the physical threat words. Panickers, but not social phobics, demonstrated increased latencies for the physical threat words (social phobics $M = 87.98$, $SD = 15.12$; panickers $M = 92.14$, $SD = 18.49$) compared to the matched control words (social phobics $M = 88.93$, $SD = 21.02$, $t(15) < 1$; panickers $M = 84.42$, $SD = 12.68$, $t(14) = 3.01$, $p < 0.009$). As expected, both groups had substantially longer latencies for color names than for *X*s (social phobics $t(15) = 6.98$, $p < 0.001$; panickers $t(14) = 9.69$, $p < 0.001$).

Table II. Color-Naming Latencies for Social Phobics and Panickers[a]

	Target words (sec)		Control words (sec)		
Card type	*M*	*SD*	*M*	*SD*	*t*
Social threat words					
Social phobics	88.02	17.17	80.30	15.72	3.80*
Panickers	88.21	14.78	84.02	14.64	1.44
Physical threat words					
Social phobics	87.98	15.12	88.93	21.02	< 1
Panickers	92.14	18.49	84.42	12.68	3.01*
Stroop (color names)					
Social phobics	127.77	35.33	73.77	16.82	6.98**
Panickers	123.20	26.59	71.61	11.75	9.69**

a. $N = 16$ for social phobics; $N = 15$ for panickers.

*$p < 0.01$

**$p < 0.001$

The difference between the color-naming latencies for social threat and control words was used as an index of social threat interference for the social phobics (a larger number indicates greater interference on the social threat words). This index was correlated with the mean fear ($M = 78.31$, $SD = 12.15$), avoidance ($M = 70.78$, $SD = 15.87$), and evaluation ($M = 80.70$, $SD = 12.98$) ratings from the fear and avoidance hierarchy. The correlation between the interference index ($M = 7.72$, $SD = 8.13$) and avoidance was significant, ($r = 0.42$, $p < .05$).

Discussion

Our hypothesis that social phobics would show greater processing of words related to their self-schemata but not of unrelated words was supported. Furthermore, as we expected, panickers did not show increased processing of social threat words but did have longer latencies for words related to their specific concerns. These data support Beck and Emery's (1985) hypothesis that social phobic and panickers have specific schemata which facilitate the processing of cues related to their sphere of vulnerability—social-evaluative concerns for social phobics and physical danger for panickers. Although these data are quite promising, we must note that the study is preliminary and requires replication.

In selecting the social threat words we specifically chose words which, based on self-statement assessment and our clinical experience, represented constructs in social phobics' self-schemata. As noted above, social phobics not only fear being inadequate in social interactions but also believe they actually do perform poorly, although objective observers may disagree (Clark & Arkowitz, 1975; Hope & Heimberg, 1988). Thus social phobics distort the events of social interactions to conform to their views of their own inadequacy. This study suggests how this distortion may occur. Social phobics devoted excessive amounts of processing capacity to information consistent with their self-schemata despite instructions to the contrary. Using such a strategy in social interactions would highlight any cues which fit their self-schemata, even if those cues were not characteristic of the overall tone of the interaction. For example, one or two speech dysfluencies would be much more salient than five minutes of fluent speech because the dysfluencies are consistent with the social phobics' self-schemata and thus are more extensively processed and remembered. Thus the social phobic reports that the dysfluencies are characteristic of his or her verbal behavior while the interaction partner likely sees fluency as more characteristic. The final result is that the social phobic's self-concept as a poor social interactor is confirmed, in spite of evidence to the contrary.

The correlation between self-reported avoidance and the social threat interference index indicates that, even within a group characterized by avoidance of their feared situations, greater hypersensitivity to social-evaluative cues was associated with more avoidance. The social threat interference index estimates the extensiveness of the processing of the social threat cues. In Beck's terminology, the index may be a measure of how vulnerable individuals perceive themselves to be in social situations. While it is logical that greater perceived vulnerability is associated with more avoidance, little is known about the relationship between cognitive processing styles and behavior. The influence of self-schemata on avoidance behavior merits further study.

This study is one of the first direct tests of the schemata of social phobics, and our findings indicate that the Stroop task is a viable strategy for examining cognitive structures in social phobia. However, these data are preliminary, and a number of methodological issues need to be addressed in future research utilizing the Stroop. First, our study was designed only to examine the amount of semantic interference generated by the social and physical threat words compared to their respective control words. Since word length and familiarity are thought to impact color-naming latencies, we carefully matched the threat and control words in order to measure only the interference caused by the meaning of the

threat words rather than by some extraneous factor. The implication is that the raw latencies for the threat words cannot be compared directly. Ideally, the social and physical threat words would be matched on word length and frequency of occurrence. However, attempting to do so dramatically reduces the pool of available stimulus words and eliminates words central to the construct of interest. Similarly, comparisons cannot be made across threat categories (e.g., comparing social threat words to physical threat control words or comparing physical threat words to social threat control words) because the two sets of control words are not equivalent. More research is needed to determine whether it is feasible to construct a single set of neutral control words for numerous sets of target words.

The second methodological issue involves whether or not schemata have to be activated before they influence processing. As discussed earlier, Smith et al.'s (1983) manipulation produced superior recall only when socially anxious subjects were anticipating an interaction. When not anticipating an interaction, their information-processing style did not distinguish them from nonanxious subjects. In the present study, schemata were likely activated since the Stroop task was completed in the setting in which the individuals had sought treatment for social anxiety and during the same appointment as other pretreatment assessment procedures. We would expect smaller differences between the social threat and control word latencies if the schemata were not activated.

Finally, although fear of negative evaluation is a common theme among social phobics, they are a heterogeneous group (e.g., Heimberg, Hope, Dodge, & Becket, 1990). Therefore, our use of standardized stimuli may have limited the effect size, and individualized stimuli would yield even longer latencies on the Stroop task. During cognitive restructuring that occurs as part of our cognitive-behavioral group treatment for social phobia (Heimberg, Becker, Goldfinger, & Vermilyea, 1985; Heimberg, Dodge, Hope, Kennedy, Zollo, & Becker, 1990), clients often use idiosyncratic language in describing their social fears. They may focus on a physical symptom such as shaking or blushing but usually at the heart of their fears is a derogatory self-statement such as "He/she will think I'm a wimp" (or "space-cadet" or "jerk" to use examples from recent groups). In the present study we summarized such labels under "inferior" and "inadequate." However, subjects' own words for such concepts may be even more central to their self-schemata and, consequently, cause even greater interference on the Stroop task.

With further development, the Stroop task may have utility for clinicians as well as researchers. First, it could become an additional diagnostic tool. If word lists that are representative of the cognitive constructs central to various disorders can be developed, the pattern of clients' interference on the various lists would suggest which diagnostic label was most appropriate. In fact, tasks such as the Stroop may be particularly useful for cases which appear to fall between two diagnostic categories. For example, it is often difficult to discriminate between panic disorder and social phobia if the person has panic attacks in social situations and fears both the symptoms and the embarrassment of visible signs of anxiety. In such a case an assessment of the person's information-processing strategies may reveal whether fear of the symptoms or of embarrassment is more central.

Secondly, the Stroop task could potentially help clinicians determine which issues should be the focus of cognitive restructuring exercises. As noted above, individuals within a diagnostic category are heterogeneous. Furthermore, they vary in their ability to report on

their thoughts. Color-naming word lists reflecting varying content of importance to patients with a specific disorder may help the clinicians determine which issues are most central for a particular individual.

Finally, if self-schemata play an important role in social phobia, then successful treatment should change them, and this change should be reflected on the Stroop. We are currently examining whether treatment gains are associated with decreased latencies for social threat words.

In conclusion, the information-processing strategies utilized by social phobics and panickers in this study support Beck's notion that anxiety-disordered individuals' self-schemata facilitate the processing of cues related to their specific sphere of vulnerability. While much remains to be done, this preliminary study and those cited above indicate that the methodologies developed by experimental cognitive psychologists have much to offer clinical researchers testing hypotheses derived from cognitive-behavioral theories of anxiety disorders.

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Note

1. Degrees of freedom equal 28 because one panicker failed to complete the Shipley Scale.

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