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TEST ANXIETY AND COPING WITH EVALUATION

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Psychology: General-Experimental

by
Jon George Mettrick

June 1998

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Approved by:



Michael Lewin, Chair, Psychology



Gloria Cowan



David Riefer

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Date

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ABSTRACT

Community college students ($n = 353$) participated in a study investigating qualitative and quantitative differences in worry as a shared cognitive component of test anxiety and Generalized Anxiety Disorder. Moreover, cognitive coping with stress was examined as a potential moderator of GAD-like worry. Participants ranked in the upper 20th percentile on a measurement of test anxiety rated significantly higher than the bottom 80th percentile on a measure of trait anxiety. Utilizing Eysenck's Hypervigilance and Processing Efficiency theories (1992) and Epstein's construct of Constructive Thinking (1991), it was hypothesized that high test anxious participants could be categorized as either GAD-like or high test / trait anxious (HT/TA) worriers on the basis of DSM-IV GAD diagnostic criteria. It was hypothesized that means tests comparing the GAD and HT/TA worrier groups would reveal that GAD worriers; would rate significantly higher on measures of number and breadth of worries, would rate significantly lower on a measure of cognitive coping with stress, and would rate significantly higher on measures of social evaluative concerns. All hypotheses were confirmed. Results are interpreted as suggesting that within a diathesis stress model cognitive coping with stress may moderate GAD vulnerability. Future research directions are discussed.

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TABLE OF CONTENTS

ABSTRACT iii

ACKNOWLEDGMENTS. iv

LIST OF TABLES vi

TEST ANXIETY AND COPING WITH EVALUATION. 1

 Limited-Capacity Threat Processing. 4

 Individual Differences in Anxiety Related
 Processing. 15

 Research on Hypervigilance 18

 HT, Test Anxiety, and Latent Vulnerability to GAD . 25

 Social Threat, Cognitive Coping, and GAD. 32

 Hypotheses. 36

METHOD

 Participants. 43

 Procedure 43

 Dependent Measures. 44

 Predictions 50

RESULTS

 Univariate Data Screening 52

 Scale Construction. 52

 Testing of Hypotheses 62

DISCUSSION 69

REFERENCES 86

LIST OF TABLES

Table 1.	Factor Loading of Three Factors: Number Of Worries	54
Table 2.	Factor Loading of Three Factors: Uncontrollable Nature of Worry in Life Domain.	56
Table 3.	Factor Loading of Three Factors: Social Anxiety When Engaged in a Specific Activity. .	59
Table 4.	Factor Loading of Three Factors: Social Avoidance of a Specific Activity when Feeling Anxious.	61
Table 5.	Differences in Mean Ratings of the Test Attitude Inventory (TAI) Upper 20 th Percentile Group	63
Table 6.	Differences Between GAD Worriers and High Test / Trait Anxious Worriers on Mean Ratings of the GAD DSM ADIS - IV Self Report Life Domain Number of Worries and Uncontrollable Worry Subscale Factors, AnTI, PSWQ, and the CTI Global Coping Scale.	66
Table 7.	Differences in Mean Ratings Between GAD Worriers and High Test / Trait Anxious Worriers: Social Phobia DSM ADIS - IV Self Report Social Evaluative Items, Social Anxiety, and Avoidance Concerns Subscales; BFNE, and SADS	67

TEST ANXIETY AND COPING WITH EVALUATION

Viewed as a response to stress, anxiety represents a possible reaction to threat detection, threat appraisal, and apprehension regarding potential outcome (Wells, 1994b). Research investigating anxiety and anxiety disorders suggests three measurable factors are central to the expression of anxiety. These are referred to as physiological, cognitive, and behavioral factors. These factors are considered as broadly representing observable responses to an anxiety producing stressor (Barlow, 1988; Lang, 1971). Thus, a person's anxious response to a stressful situation that signals threat may be an increase in heart rate (physiological), an unwanted preoccupation with diffuse and worrisome thoughts concerning potential outcomes and/or future similar anxiety producing situations (cognitive), and the subsequent avoidance of like situations based upon the person's expectancies and apprehensions of the experienced anxiety reoccurring (behavioral). These factors are typical of anxious responding to stress observed in clinical and non-clinical populations (Beck & Emery, 1985).

Daily activities can produce unwanted stress without producing anxiety. In this regard, an individual's ability to adequately cope with life events is related to whether stress results in anxiety. It has been shown that coping with stress contributes to psychological well-being and

overall health (Selye, 1976). Thus, it is a reasonable assumption that successful coping serves to moderate the course of stressed responding in such a way that anxiety may also be moderated (Dombeck, Siegle, & Ingram, 1996; Lazarus, 1993; Smith, 1996). For instance, a student facing an exam may feel stressed over it. However, stress may elicit that a competent plan as a form of coping with any perceived problems in performance. Studying differences in the relationship between people's perception of stressful social situations and attendant anxiety may provide evidence regarding how the cognitive, behavioral, and physiological factors of their anxiety are influenced by coping's moderating effects.

Theorists have emphasized the relationship between certain affective disorders, such as social phobia and Generalized Anxiety Disorder (GAD), and negatively biased social perceptions (Borkovec, 1994; Eysenck, 1992). Specifically, an individual's unrealistic concerns over behavioral competency and adequate social responding during social interaction may induce and sustain a stress-related anxiety component of the disorder (Carver & Scheier, 1988). These biased perceptions are correlated with a fear of negative evaluation by others, fear of failure, and excessive and uncontrollable worry (Barlow & DiNardo, 1991; Borkovec & Inz, 1990; Eysenck, 1992).

Research based on such theories suggests that some

people may automatically process ambiguous social stimuli as threatening, interfering with otherwise effective coping by inducing a state of stress that elicits anxiety (Borkovec, Shadick, & Hopkins, 1991). Individual differences in biased endogenous threat processing (i.e., dispositional/trait anxiety) can negatively impact responding in stressful social situations when a current and otherwise normal activity is perceived as being susceptible to threatening social evaluation (Campbell & Fehr, 1990). Anxiety may then lead to disruption of task-focus and an evolving perception that a climate of negative evaluation exists. For people who are predisposed to process in this manner, such perceptions may elicit chronic compensatory patterns of anxious behavior, thought, and physiologic responding (Olah, Torestad, & Magnusson, 1989; Ormel & Wholfarth, 1991).

Thus, under stressful circumstances a coping individual may be incapable of maintaining adequate levels of task-focus and performance. Reduced task performance would facilitate worry and anxiety that in-turn would facilitate the degradation of ongoing responding across social situations in-general. The evolution of an individual's transient, stress-induced biased processing of threat stimuli towards chronic and maladaptive anxious-response themes of social behavior is a component of theoretical models for vulnerability to, and genesis of, clinical anxiety disorder (C.F., Beck & Emery, 1985; Eysenck, 1991c;

Gray, 1985; MacLeod, 1996).

The stressful initiation of perseverating, excessive worry may follow inappropriate responding elicited by the perceived climate of evaluative threat. The incessant rumination of negative thoughts then leads to greater worry and more inappropriate responding resulting in a vicious cycle exacerbating anxiety and ineffective coping. Under these circumstances worry is the principle response-factor characterizing the experience of anxiety. When worrying persists over an ensuing time period of six months, a major constituent of a clinical GAD diagnosis possibly exists (Barlow et al., 1986). Thus, research studying worry as representing the increased vulnerability to anxiety is a necessary pursuit, considering anxiety's debilitating effects.

Limited-Capacity Threat Processing

As a survival adaptation, threat's rapid detection increases the likelihood of successfully avoiding harm. In their comprehensive review of experimental evidence concerning the role of attention and anxiety, Williams, Watts, MacLeod, and Mathews (1988) suggest that the detection of threat engages both nonconscious (preattentive) and conscious (focused attention) aspects of cognitive processing. As a stimulus is detected, scrutinized, and subsequently perceived to be threatening, an increase in arousal occurs. Under these conditions, arousal is

accompanied by the increased allocation of cognitive resources allotted to the threat processing of that stimulus (C.F., Barlow, 1988; Martin, Heimberg, & Hope, 1993; Shapiro & Lim, 1989).

Initial stressful stimulus detection may solicit threat processing without resulting in worry, situational avoidance, or physiological distress. Following threat's detection, but prior to any appropriate responding that may occur, the context in which the threat-stimulus is embedded needs to be evaluated (Eysenck & Calvo, 1992). Context-dependent threat processing includes possible stress reactions, relevant perceptions, and the allocation of automatic and controlled attentional resources. Such processing may be considered adaptive to the extent the situation is appropriately appraised as a pre-condition to threat or non-threat responding. Therefore, threat processing can be considered a necessary but not a sufficient condition for anxiety.

Thus, the continuation of ongoing behavior disregarding as threatening an indeterminable, ambiguous social stimuli may represent appropriate responding to initial threat detection without attendant anxiety. For example, a student's perception of missing lecture notes concurrent with stressful anticipation of an upcoming exam may not elicit uncontrollable worry concerning their test-taking ability. In contrast, unable to determine the weighted

importance of the missing information, the student can focus on existing lecture notes, homework, and course readings. For this student, the processing of ambiguous stimuli moderates the experience of anxiety and the perception that exams are a threatening stimuli representing negative performance evaluation by others.

Processing Efficiency Theory (PET; Eysenck & Calvo, 1992) maintains that some individuals are dispositionally oriented towards worry as a response to situational stress that induces anxiety (state-anxiety). Worry requires cognitive resources that would otherwise be used for the efficient processing of, and efficient responding to, important environmental information. PET assumes that stressful situations require corresponding increases in cognitive effort over and above that which is currently being utilized. PET postulates that for those people whose response to stressful situations is worry, the additional effort compensating for worry's effects only serves to maintain current levels of performance. The same effort provides a performance benefit in the case of the non-worrier. For example, a worried student may have to concentrate and re-read an important assigned article to overcome distracting unwanted thoughts and maintain their reading-comprehension level. On the other hand, the same level of concentrated re-reading by a non-worried student would result in a greater depth of comprehension. It is

assumed that this observed difference occurs due to worry being maintained by focused attention and lexical rehearsal in working memory and worry's preemptive utilization of cognitive resources that would otherwise facilitate the task at-hand.

PET utilizes a model of working memory that posits three subsystems (Baddeley, 1986; Baddeley & Hitch, 1974). These subsystems are the *executive*, the *articulatory loop*, and the *visio-spatial sketchpad*. The executive (i.e., central executive) is primarily involved with the integration of incoming sensory information with information in long-term memory and the coordinating of focused attention mediating stimulus response. The executive is also the analog of attention in awareness or consciousness. The articulatory loop (i.e., phonological loop) serves to process lexical comprehension. Another function of this subsystem is to maintain auditory and lexical information in memory through rehearsal long enough to be considered by the executive for storage in long term memory. The visio-spatial sketchpad represents a visual imagery memory capacity of limited duration. This aspect of working memory is assumed to facilitate mental imagery by maintaining an analog of visual stimuli during that stimuli's cognitive processing (e.g., looking at a wall-map while attempting to visualize and memorize relevant landmarks).

There is evidence supporting PET in recent research on

the effects of worry on working memory. For instance, in an experiment requiring the transformation of letters in forward numeric-dependent alphabetic sequence (i.e., MH + 2 = OJ) by high and low anxious individuals, the high anxious group had significantly greater response times when compared to the low anxious group; anxiety affected the performance of letter transformation associated with increased processing in the worry-related areas of working memory (Eysenck, 1985).

Worriers simultaneously utilized existing cognitive resources and maintained worry. Cognitive effort did solve the letter transformation task, but not by the efficient use of resources in working memory where response-speed is considered an index of processing efficiency. The low anxious group took comparatively less time to complete the cognitive task. For them, increased effort contributed to an increase in efficient problem solving. High anxious individuals were unable to redirect working memory towards problem solving presumably due to its maintenance of anxious worry. This inability was evidence of limitations imposed by this group's restricted capacity of resources.

These results suggest that attentional resources, otherwise available to the executive for directing focused attention toward the arena of working memory, were engaged by the articulatory loop and its lexical processing function of thought rehearsal presumed to maintain worry. In a

review of these experiments, Eysenck (1992) concluded that "... worry induction produces a shift towards predominance of ... the workings of the articulatory loop ... it would clearly be useful to have additional information concerning the processing mechanisms involved in worry" (p.145).

Situational stress and the advent of anxiety are correlated with perceptual activity, arousal, and levels of adequate responding in a performance task (Shapiro, Egerman, & Klein; 1984). There is experimental evidence supporting the assertion that people possess finite cognitive resources limiting the ability to effectively process information when conditions are sufficiently stressful (Beck & Emery, 1985; Darke, 1988; Eysenck, 1985). The thrust of research in this area is invested in understanding how anxiety loads additional non-conscious processing demands upon working memory until effective cognitive appraisal of threat-related stimuli and adequate response becomes problematic, if not maladaptive.

Easterbrook (1959) postulated a relationship between anxiety, arousal, and attention during task performance. Arousal significantly attenuates the focus of attention on a task, thereby narrowing its scope (i.e., cognitive breadth of attention in awareness). Thus, in Easterbrook's view a narrowing of attention that may initially benefit performance occurs in response to anxiety by limiting the quantity of irrelevant information attended to. However, a

continued increase in arousal may lead to the continued narrowing of attentional focus. Subsequently, task-relevant information previously located within the scope of attention is peripheralized and not detected. A narrowing of attentional focus past the point of effectiveness results from an arousal factor and arousal's effect on attention.

Easterbrook's hypothesis posits a relatively direct correspondence between an increase in arousal and the narrowing of visual attention. The arousal-attention process is predicated upon concurrent threat detection and cognitive appraisal where arousal directs the function of attention. The convergence of attention on a detected threat source following anxious arousal limits the availability of necessary information--over-focusing precipitates a decrement in response performance.

There is qualified experimental support for Easterbrook's hypothesis from studies that suggest experimental peripheral detection tasks performed during stress-induced anxiety-arousal states result in narrowed attention (C.F., Levinson, 1989; Nideffer, 1993). However, Eysenck (1992) points out that "When peripheral information is of as much relevance as central information, then anxiety seems to be associated with a broad sampling of information" (p. 54). In other words, if there is a situational demand for response where the overall environment is considered threat-salient, a larger visual sampling of information will

be attempted, including that on the periphery of vision. For instance, a person who is presenting a vitally important project to an unfamiliar group may visually appraise salient threat stimuli from a broad attentional field. The person may automatically, repeatedly and in rapid succession, scan the room for cues in an unfocused manner--peripherally noticing facial expressions, furious note-taking, drooping eyelids, anxious posturing. This is in contrast to an equally arousing exam-taking situation where salient threat can focus the same person's attention upon individual written items one-at-a-time, eliminating other distractions.

Eysenck (1992) suggests that certain aspects of visual attention help to explain why these alternate and contrasting scope-of-attention processes may occur. First, attention and anxiety affect the visual spotlight (visual "beam" of attention) conditionally--depending on the circumstance, there may be either an enlargement or contraction in breadth. Thus, to some extent, vision can be both broadened to enhance a searching-pattern capable of locating dispersed threat-related cues and narrowly focused on a particular area in the environment that is relevant to responding. Second, a stimulus once detected is then identified--if the stimulus is perceived as a threat, attention is localized to that point (focused attention). Third, semantic processing is limited to perceptions in the center of the field of attention--individuals only ascribe

meaning, through association in memory, to information that is the focus of their attention in the visual field. Focused attention is in contrast to a purposeful search of the environment meant to detect possible sources of stimuli (attentional search). The last point distinguishes interaction between the broadening and narrowing of the visual beam and the process of focused attention from that of attentional search (Broadbent, Broadbent, & Jones, 1986).

A finite cognitive resources perspective assumes that a limit to what can be effectively processed would necessarily influence the quantity and quality of information available. It is likely, from the standpoint of anxiety, that the relationship between cognitive function and performance deficits involves the correspondence between a finite capacity for information processing and an attentional and perceptual interaction that impedes effective responding under stress. This line of research does not consider that observed maladaptive performance in the face of a perceived-threat results from inattentiveness (ignoring information) or faulty drive processes (fight or flight).

Dysfunctional responding reflects interactions between a stress-induced state of anxiety and endogenous aspects of limited cognitive processing capacity, both attentive and pre-attentive. The model of working memory, limited capacity, and coping ability are implicated in a limited cognitive capacity explanation of anxious responding. This

is in contrast to a view that predicts a direct relationship between arousal and the narrowing of attentional focus, but does not preclude inattentiveness or faulty drive processes.

Differences exist between processing limitation perspectives and Easterbrook's hypothesis. First, experimental evidence suggests there are relevant attributes of working memory that serve to limit information processing (Baddeley, 1990). In a recent review of studies investigating GAD, Borkovec (1994) concluded that the executive and the articulatory loop overwhelmingly dominate cognitive resources, maintaining threat as worry in working memory, at the expense of imaginal processing. This suggests that the allocation of processing resources interactively supports an organizing role of focused attention. The implicit variation of responses to threat in a given situation is more in accord with experimental data concerning individual differences in threat-related stimulus perception and responding. This is in contrast to a direct relationship between arousal and narrowed attentional focus dictated by Easterbrook's hypothesis.

Second, a limited resource capacity perspective infers the advent of worry and intrusive thoughts as a component of anxiety in working memory. A negative biasing of ongoing mentation through selective interpretation of ambiguous stimuli as threat-related has been shown to impact cognitive processing (Sarason, Pierce, & Sarason, 1996). In this

regard, MacLeod (1996) states that, ". . . evidence has accumulated to suggest that it is the worry component of elevated anxiety, rather than the arousal component, which is most strongly predictive of impaired cognitive performance" (p. 48).

Third, limited cognitive resources allow for situational stress and individual differences in coping ability to be related in diathesis origin. The preceding discussion suggests a correspondence between the degree of worry, the influence of stress-induced anxiety on the perception of threat, and the degree to which that threat-perception intrudes upon an individual's ability to cope with anxiety. In other words, when responding to a stressful situation with the potential for perceived harm, biased processing of threat relevant information assumes primacy in working memory rather than instituting an automatic arousal concomitant with narrowed attentional engagement. It follows that the behavioral, cognitive, and physiological channels of anxious responding are observable manifestations of the complex interactions between stress, anxiety, arousal, and attention co-occurring with cognitive processing of perceived threat stimuli. Once again, this is in contrast to the observable factors of anxiety resulting from processing primarily dominated by the effects of arousal on attention.

Furthermore, decreasing arousal alone is not

necessarily correlated with the successful treatment of anxiety. In some instances (e.g., test anxiety) mitigating arousal is ineffective (Spielberger & Vagg, 1995). An information processing model considers coping with anxiety as moderating aspects of arousal and other factors that may otherwise come to dominate information processing (e.g., anxiety and attention). Identifying those attributes of cognitive coping that moderate worry as a dominant component of anxiety elicited in response to a perceived evaluative threat may reveal important information concerning the regulation of anxious responding. If this is the case, the presence or absence of conditions that are related to specific coping attributes may contribute to understanding the presence or absence of vulnerability factors related to anxious dysfunction.

Individual Differences in Anxiety Related Processing

People's acquired associations between stress in a social context and perceived threat (e.g., fear of an impending evaluation in a social setting) may contribute to an increased sensitivity for anxious responding (Williams et al., 1988). The increased propensity for experiencing stress and anxiety can develop to the point where the demand for cognitive resources prohibits effective appraisal or adequate performance in everyday situations that are innocuous but similar to those in which the original threat-association was acquired. For example, a novice college

student may consider class discussion a frightening experience due to past associations where providing an inadequate response in high-school meant an episode of negative social evaluation. In this case, regardless of the student's preparation or knowledge, actively participating in class may not be forthcoming due to worry elicited by the aversive effects of anxiety upon retrieval of the right thing to say. Individuals susceptible to a stress-induced bias for processing ambiguous social situations as evaluative threat may inadvertently increase their likelihood to engage in anxiety-related processing in particular, at the expense of accurate perception and task-relevant behavior (Eysenck, 1992).

Within the context of perceptions and cognitions of threat-related stimuli, Eysenck (1991b) has proposed a *hypervigilance theory* (HT). HT assumes that cognitive processes relevant to threat detection are evolutionarily adaptive. Thus, hypervigilance is related to a normal endogenous cognitive function that executes a rapid orientation of automatic perceptual processing supported by the re-allocation of attentional resources from competing neutral stimuli to signals of threat (Gray, 1985). HT places the automatic focusing of attention on threat in the context of a characteristic innate cognitive feature of attention essential to survival. This aspect of attention facilitates appropriate and functional cognitive channels

for threat's rapid detection.

It follows that attentional bias towards threat processing is subject to individual variation. According to HT, a cognitive bias for over-processing threat represents an increased affectability of systems that are otherwise evolutionarily adaptive. Therefore, in an otherwise functional non-clinical population, anxiety disorder may originate with the over-processing of both threat-related and ambiguous situations as those that precede harm. It is on the basis of these assumptions that HT predicts differences of pre-attentive and attentional cognitive functioning between individuals who possess a temperamental predisposition towards higher levels of anxiety and those not so temperamentally predisposed--referred to in HT as high trait-anxious and low trait-anxious individuals respectively. Furthermore, HT posits a relationship between high dispositional trait-anxiety (HDTA) and anxiety disorder. These individuals represent a population characterized by an endogenous proclivity to regularly over-process task irrelevant ambiguous stimuli as threat-related. The limited amount of cognitive resources that remain when in an increased state of stress is inadequate for normal functioning. Thus, these individuals may have an overall lower threshold of susceptibility to anxiety, worry, and anxiety disorder.

Research on Hypervigilance

Hypervigilance is an individual difference in perception processing that can be directly related to anxiety (Eysenck, 1992). HDTA individuals may manifest hypervigilance in several ways. There may be a noticeable inclination towards automatically processing information that is irrelevant to the task-at-hand. This amounts to distractibility, characterized by mind-wandering and the inability to sustain focused attention on necessary task-related functioning. Visual scanning may also present itself with quick eye movements seeking out threat-related stimuli that, once located, may elicit subsequent eye-fixation. There may be biased or selective attention towards threat-related rather than threat-neutral stimuli; attention is repeatedly directed towards stimuli in the immediate environment that is possibly, but not necessarily, related to harm. An additional quality that may be present is the broadening of attention prior to detecting and processing the salience of threat related stimuli, followed by a narrowing of attention during threat processing. This corresponds to the narrowing and widening of the visual beam of focused attention that facilitates the detection of threat-related stimuli and subsequent allocation of processing resources directing a threat response.

The interactive quality of anxiety in the presence of stressful situations has led researchers to investigate the

role of HDTA and state anxiety components in the etiology of anxiety disorder--both are implicated in the development of anxiety related dysfunction. It is important to clearly emphasize that dispositional (trait) and state anxiety are conceptually distinct. Trait anxiety has been characterized as temporally stable and dispositional (endogenous). In contrast, state anxiety is generally regarded as temporally transient and situationally defined (exogenous).

Eysenck (1992) has suggested that the distinction between trait and state resembles what Ryle (1949) has termed "disposition and occurrence. Disposition is an attribute given in consideration of predictable responses that are consistently evident across time under identifiable conditions. In contrast, an occurrence is an observed response isolated in time and frequency as a single event. In this sense negative responding to testing as evaluative questioning is consistent with disposition whereas worry focused upon the grade is preoccupation with a specific result or occurrence.

In accordance with the separateness of disposition and state, research on HT has focused on comparisons of task performance under conditions of cognitive demand. HT research typically employs participants from functional populations rated high and low on dispositional anxiety, clinically disordered populations, and successfully recovered anxious populations. In this regard, Eysenck has

suggested that experimental data on HT reveals a relationship between Generalized Anxiety Disorder (GAD) and the HDTA individual.

GAD is a diagnosable DSM-IV anxiety disorder. It is a defining characteristic of individuals who are diagnosed GAD-positive to manifest "... an intensity, duration, or frequency of... anxiety and worry [that] is far out of proportion to the actual likelihood or impact of the feared event. The person finds it difficult to keep worrisome thoughts from interfering with attention to tasks at hand and has difficulty stopping the worry" (DSM-IV, 1994; p. 443).

A central component of GAD is a systematic bias in the interpretation and subsequent processing of irrelevant, ambiguous stimuli as threatening. HT assumes that this bias is a non-normal cognitive function related to the presence of hypervigilance in HDTA individuals.

Eysenck (1991) has found support for HT in a series of studies investigating cognitive vulnerability to GAD. His assessment is principally concerned with discriminating between two hypothesized forms of cognitive vulnerability to GAD that may be present in HDTA individuals. One possible form, termed "*manifest vulnerability*," represents a low-level of constant and chronic vulnerability to anxiety disorder that exists regardless of state anxiety or stress. The second possible form is termed "*latent vulnerability*."

Latent vulnerability represents a threshold for clinically anxious dysfunction that is significantly lowered for HDTA individuals when compared to non-HDTA individuals in certain situations. The dysfunctional condition only emerges in the presence of stress-induced anxiety state anxiety, indicating that latent vulnerability is stressed-state dependent.

HT research paradigms measure differences between the anxiety-related cognitive functioning present in groups of HDTA individuals, low dispositionally anxious normal controls, currently diagnosed clinically GAD individuals, and recovered post-morbid GAD individuals. If a state-anxiety-independent manifest vulnerability factor exists for GAD, cognitive-related task-performance in unstressed HDTA individuals should more closely resemble GAD populations when compared to normal controls or recovered GAD populations. On the other hand, if HDTA individuals more closely resemble normal controls until a stress-induced state of anxiety occurs, at which time their cognitive functioning is relatively comparable to that of GAD populations, then support would be found for a latent vulnerability factor. Consistent with a diathesis-stress model, Eysenck's research suggests that hypervigilant HDTA individuals in methodologically appropriate stressful situations are representative of a latent vulnerability to GAD.

Additional research has implicated the presence of

hypervigilance in HDTA individuals. In an important illustration of the distractibility component of HT, Mathews, May, Mogg, and Eysenck (1990), manipulated the awareness of location for a target stimulus presented with either neutral or threat-related destructors. In their study, Mathews et al. utilized groups of GAD recovered and currently diagnosed individuals in addition to normals. Two experiments analyzed differences between groups on the speed of stimulus detection when neutral letters or words were presented as stimulus targets in the presence of various destructors.

In the first experiment, the neutral letter target was detected on-screen, in the presence of a number termed a destructor digit. These targets were not processed significantly different by any of the three groups when compared to one another. In the second experiment neutral words were used as targets, and threatening or non-threatening words were presented simultaneously as destructors. When compared to normals, the recovered and currently GAD diagnosed groups showed significantly greater latency (slower detection speed) in locating the target, across cued (a dot indicating the target's forthcoming location) and uncued (no indication) conditions in the presence of destructors. In the absence of destructors there were no significant differences between groups; distraction rather than orienting cues affected the anxious

groups.

A comparative analyses of the three groups concerning distraction effects (using either threatening or non threatening destructors) on uncued trials revealed that when non-threat destructors were presented, the pattern of effects in the normal and recovered groups resembled each other. This suggests that GAD recovered individuals and normals locate and process words in the presence of non-threat distraction equally well; distraction in and of itself was not a factor. This was in contrast to the threat word destructor condition where recovered GAD individuals resembled the currently diagnosed GAD individuals while neither resembled the normal controls. Although capable of processing in the presence of distraction per-se, the qualitative nature of the distraction affected recovered GAD individuals, with threat words demanding an increase in cognitive processing.

Similar support for hypervigilance as a component of dispositional anxiety and its relationship to GAD comes from experimental investigations of selective processing (for a discussion, see Eysenck, 1991a). Mogg, Mathews, and Eysenck (1992) compared GAD, GAD recovered, and normal control groups with each other on the selective allocation of attention towards threat related and neutral words presented in paired sequence. The first word in the presentation sequence was a prime eliciting the activation of semantic

associations in memory. Immediately following the prime, the paired neutral or threat-related target-word appeared and was vocally identified by the participant. A reduction in the time taken to identify the target-word was assumed to indicate that a facilitation of attentional responding had occurred due to the semantic association with the antecedent prime-word present in memory.

As predicted, the normals showed no difference in the allocation of attention when comparing threat-related to neutral target word-naming response times. However, the GAD diagnosed individuals showed a significant attentional bias towards threat-related target words over neutral words. This was indicated by the relative increase in speed with which the naming of threat-related words took place. These and other experimental findings suggest that hypervigilance is a substantive element contributing to dispositional anxiety (for a discussion, see Eysenck, 1992).

Current research investigating HT is focused on determining if predicted elements in high trait anxious individuals are at work in the postulated relationship between biased threat processing and the latent vulnerability to GAD. Eysenck (1992) has concluded that fear of evaluation occurring in a social setting may be implicated as one such element. Importantly, he states that the biased processing of ambiguous stimuli as threat-related may create "... unrealistic social-evaluative worries"

(p.162) that are excessive and uncontrollable. The selection of a social environment where state-anxious and trait anxious individuals are routinely evaluated would complement an investigation of possible relationships between the fear of evaluation, worry, and stress-induced anxious dysfunction representing a latent vulnerability factor to GAD. College students with test anxiety are such a population. The worry and fear of evaluation in test anxiety corresponds to those elements of anxiety and threat that Eysenck has suggested affects the relationship between endogenous biased threat processing and latent vulnerability (Flett & Blankstein, 1994).

HT, Test Anxiety, and Latent Vulnerability to GAD

College students represent an adult population in which testing, as a social evaluative experience, is a common source of stress. Test anxiety may be viewed as a specific category of social-evaluation anxiety occurring in this non-clinical, and so, generally functional population (for a discussion, see Krohne, 1992). Test anxiety is defined as the maladaptive and anxious response to the stressful evaluative experience of testing concomitant with a persistent preoccupation with possible failure (Sears & Milburn, 1990). Furthermore a central feature in test anxiety in excessive and intrusive ruminative thoughts concerning negative evaluation (Carver & Scheier, 1989).

Studies (e.g., Sears & Milburn, 1990) have shown that

test anxious individuals' attentional focus is constrained during test taking by a fear of failure due to their self-perceived lack of behavioral competency when subjected to evaluation; in test anxiety the test is cognitively over-processed as a perceived threat stimulus that elicits a fear of negative evaluation and anxious worry concerning poor performance. Fear of negative evaluation is a distressed and anxious preoccupation with others' perceptions of the individual's failure to adequately perform in accordance with social norms. The test-anxious individual is threatened and worried by sustained, unwanted, and intrusive thoughts related to perceptions that suggest an inadequate test performance may lead to a form of social rejection and social censorship by others.

During test-taking, the test anxious student exhibits the three factors generally found in anxious responding. Thus, there may be present the worries, actions, and sensations characteristic of the behavioral, physiological, and cognitive response channels observed in anxious individuals. For example, test anxious individuals may simultaneously act to behaviorally subvert their doing well on the day of the test by showing up late (behavioral; Murray & Warden, 1992), expect to suffer from moments of physiological distress such as heart palpitation, sweating, dizziness (physiological; Reiss, 1991), regard the test as linked to an ever-expanding cycle of failure in general

(worry; Flett & Blankstein, 1994), and experience an inability to sustain task-related mental focus (cognitive interference; Sarason, 1984).

Research suggests that fear of evaluation in test anxiety is consistent with the fear of negative social evaluation (FNSE) component observed in GAD (C.F., Edwards & Trimble, 1992; Endler, Parker, Bagby, & Cox, 1991). Furthermore, in both test anxiety and GAD, worry as the cognitive component of anxiety is most representative of an individual's threat processing and responding. Thus, corresponding differences between the worry these two groups have may reflect differences in aspects of the stress they experience (e.g., school vs. work, class discussion vs. public speaking). It follows that characteristic attributes of worry that differ between test anxiety and GAD may somehow represent separable processing characteristics affecting dysfunction across differing stressful situations. In the academic environment, where the organized and ritualized regimen of higher education culminates in evaluation by a familiar and standardized form of testing, anxious responding may be isolated in narrow areas, such as a fear of tests and worry about grades.

However, the scholastic expression of social-evaluative fear may contrast with its expression in a relatively spontaneous everyday social environment. For example, unlike the student facing a test, a trait anxious sales

person extemporaneously speaking at a out-of-town meeting may be the object of intense evaluative scrutiny. If this stressful evaluative experience leads to anxiety and an inadequate performance, it seems improbable that a corresponding fear of the meeting's topic would become the focus of worried thought. Rather, an increased occurrence of broad and diffuse worry about stressful evaluative responding in-general seems more likely. This is in accord with HT's perspective in that biased processing of ambiguous social stimuli as threat-related may meaningfully contribute to increased unrealistic worry. Thus, an initial stressful social interaction that increases the awareness and fear of possible negative evaluation may initiate or contribute to chronic, broad, excessive, uncontrollable worry of a kind that characterizes GAD.

Learning the process of learning how to be successful in evaluative situations is one job of institutionalized education. In this regard, the scholastic environment's function is to inculcate coping strategies as a means of meta-enabling the student. Importantly, the material to be learned is presented in a manner appropriate for an unambiguous and clearly stated evaluative objective achieved through formal testing. The effect of this learning may transform the HDTA student's perception of evaluative threat in-general into a fear of test taking in-particular. HDTA anxious students with high levels of test anxiety may be

representative of endogenous biased threat processing. However, the disordered expression of this bias threat as GAD, may be moderated by the structured, routinized, educational environment with its relatively effective and concerned population of accessible peers, scholars, and administrators.

The explicit rules and the implicit routines of a university-dominated lifestyle impose an organized structuring of behavior. The enforced doctrines of matriculation and the repeated, unavoidable, systematic exposure to a disambiguating learning environment may increase some HDTA student's overall coping proficiency. This seems reasonable as the academic environment is ostensibly formulated to orient the focus of attention toward situationally relevant social stimuli in a non-threatening and unambiguous way in order to preclude unwanted distraction. In part, academia may inadvertently increase cognitive functioning in some HDTA students by environmentally suspending the proclivity for biased threat-processing and anxiety-driven global worry. What remains as a residual is the stress-induced test anxiety. For these students, test taking is the academic equivalent to a stressful social situation where hypervigilance biases cognitive processing and inadequate coping with negative evaluation and failure perpetuates a degradation of task-performance.

The test anxious student's adaptive responses to the systematic training of academic discipline may direct attention away from non-scholastic evaluative concerns that might otherwise sustain an evolution towards severe global dysfunction (Endler, Kantor, & Parker, 1994). Spielberger and Vagg (1987) have noted that test-anxiety treatment programs rely upon a predictable traditional educational setting to help inculcate effective coping strategies. These programs utilize group discussion, skills training, and focused cognitive processing directing effort towards overcoming evaluative concerns. The intent is to " ... help students to organize and structure their activities in test situations, thus contributing indirectly to improved test-taking skills" (Spielberger & Vagg, 1987; p. 182).

In comparison with a university context, everyday social evaluation may be subject to a lesser degree of environmental moderation. For instance, a job interviewer might challenge an HDTA job candidate with a fear of negative social evaluation to make an impromptu presentation of an imaginary product line. In this and similar instances, environmental structure is problematic, and occurrence of disordered anxious cognitive, behavioral, and physiological responding that perseveres across time may be more likely. If a latent vulnerability factor exists, the lack of structure and learning may contribute to the

occurrence of chronic worrying characteristic of GAD (Carver & Scheier, 1989).

Under stressful state-anxious evaluative conditions, the test anxious HDTA student exhibits all three of the factors of anxious responding. However, the most operative dysfunctional factor is the cognitive element of worry. Furthermore, recent evidence suggests that the test anxious individuals' fear of evaluation is closely tied to a corresponding social evaluative fear present in GAD diagnosed individuals (Edwards & Trimble, 1992; Endler, Parker, Bagby, & Cox, 1991). HT, PET, and the speculated latent vulnerability to GAD present in certain trait anxious individuals, suggest that the fear of negative evaluation component in test anxiety is related to the FNSE component in GAD and social phobias. Thus, some students with test-anxiety may represent socially anxious, but coping, trait anxious individuals with a moderated vulnerability to GAD.

In consideration of this possibility, related questions emerge. For instance, is a GAD evaluative worry component present in some test anxious HDTA college students but not others? Do some test anxious individuals quantitatively differ in worried-thought occurrence and worry-arena breadth from others? In addition, do they differ in how diffuse their worried ruminative thoughts are--a qualitative aspect of their worry? Do differences in the quantitative and qualitative aspects of worry correspond with differing

degrees of general coping ability in test anxious HDTA college students?

Social Threat, Cognitive Coping, and GAD

The current discussion takes the perspective that stress-induced, state anxiety elicits the biased processing of ambiguous social stimuli as evaluative threat initiating uncontrollable anxious worry in some HDTA individuals. In response to the demands of stress, working memory's executive control attempts to allocate additional cognitive resources. Some HDTA individuals have no excess resources available and cannot shift utilized resources to the executive control, presumably due to the maintenance of on-going worry in the articulatory loop of working memory. Thus, an important quality of HDTA individuals is that worry limits the degree to which perceptions of threat can be efficiently regulated. Under stress, increased cognitive effort may cope with additional demands from the executive control, although effort does not increase the efficiency of responding as much as maintain existing performance levels.

It is reasonable to assume that if the HDTA individual's cognitive efforts successfully cope with situational response-demands, decreasing stress may occur. However, threat-processing is regulated outside of awareness and not directly moderated by increased cognitive effort. The HDTA individual's negative cognitive bias works against effortful coping and overloads working memory systems. This

can lead to a global state of anxious arousal producing intrusive and uncontrollable worrisome ruminations (lexical processing) that serve to facilitate gross misperceptions and misrepresentations in consciousness while decreasing the probability of adequate social responding. What responding does occur is a warding-off of threat in the guise of socially unacceptable and inept conduct (defensiveness possibly concomitant with avoidance). The implied circularity of negative interpersonal responding has been a contributing pre-morbid factor in the case histories of GAD (Vitkus, 1996).

A specific category of social interactions may be intensely stressful to an HDTA individual (e.g., speaking with authority figures, interacting with the opposite sex). According to the theoretical perspective taken by this study, circumstances that elicit corresponding anxious arousal also increase the probability for automatic interpretation of irrelevant/ambiguous stimuli as threat and subsequent threat responding as one or all of the observable anxiety response channels--cognitive, behavioral, and physiological factors. It is reasonable to assume that experiencing a spiraling incline in the frequency of and intensity of stressful situations may contribute to higher levels of global stress. Thus, an overall increase in the frequency of anxiety provoking situations may lead to a lengthening in duration of event related stressed-states and

heightened perceived presence or salience of event related evaluative threat.

Given the above, it seems unlikely that the HDTA individual would respond to fewer and fewer situations with worry. Rather, a generalization of perceptions of evaluative threat and ambiguity would seem to be indicated. Thus, over time the HDTA individual may develop a circularity of anxious dysfunction that generalizes to a broader variety of recurring situations, increasing the probability that uncontrollable worry will be a consistent element present during many different social interactions across many life-domains. Furthermore, there may be an acquired susceptibility to engage in threat processing. This is made more probable given the reasonable assumption that most social interaction requires a tacitly understood and shared context that abridges ambiguity in communication. However, under stressed circumstances, ambiguity may nevertheless prevail.

Consider the perceptions of an HDTA student attempting to add an important class. The shared context between themselves and a professor who might add them may be disparate, due to the student's automatic bias for threat processing. The resulting ambiguity could obscure the perception of information relevant to efficient interaction between the student and the class instructor. If a stressful professor/student interaction ensues, the already-

stressed HDTA student's anxiety and worry may escalate past the point of effortful coping, with simultaneous maintenance of adequate task performance becoming problematic. Under these circumstances, the student might not be able to re-focus adequate attention upon relevant disambiguating information; despite either person's intent, the student's task-disoriented processing could become a string of defensive, poorly conceived responses. The student's ability to direct the conversation towards a satisfactory conclusion at that point would be unlikely. The student's failure to successfully petition might contribute to sustaining the now-decreased threshold for global anxious social responding under induced stress.

Eysenck (1992) postulates a relationship between coping strategies and vulnerability to clinical anxiety, stating that "inter-individual" social evaluative cognitions comprise the preponderance of worried thought-content in HDTA individuals. The preceding scenario describes a fictional circumstance that is supported by evidence from many different related lines of experimental inquiry cited by Eysenck. Related research includes studies on self-confirmatory evidence seeking by individuals in social situations (Swann, 1987), HDTA negative self-perceptions (Endler et al., 1996), and HDTA individuals' inappropriate social behavior inducing situational stress (Campbell & Rushton, 1978; Ormel & Wolfarth, 1991).

Hypotheses

Utilizing Eysenck's theoretical framework as meaningful empirically driven constructs with explanatory power concerning the development of worry in GAD, the current study posits specific relationships concerning trait anxiety, test anxiety, and GAD.

Research suggests that trait anxiety and test anxiety are characterized by the biased cognitive processing of threat, eliciting worry as the cognitive component of anxious responding (Eysenck, 1992). Therefore, individuals with high measures of test anxiety should also be trait anxious. These individuals would represent both high trait anxiety and high test anxiety.

Studies of clinically diagnosed GAD populations that have used non-clinical trait anxious populations as a comparison group report a significant correlation between trait anxious worry, as a response to evaluative threat, and worry in GAD. These and other studies report that uncontrollable diffuse worry across many life areas, a key feature existing in pre-morbid and currently morbid GAD populations, pervades the mentation of situationally stressed trait anxious individuals. Both experimental and correlational investigations of GAD utilize the similarly reported characteristics of trait anxious worry as the response component most representative of the disorder (for discussion see Eysenck, 1992). As a result, among high test

anxious-high trait anxious individuals, differing qualitative and quantitative aspects of worry as the cognitive component of anxious threat responding to evaluation should not be distinguishable.

Heretofore, studies exploring a relationship between trait anxiety and GAD have assessed differences in maladaptive responding to stressful situations and not comparative differences between the nature of anxious worried thoughts. These findings suggest that excessive worry in high trait anxious test anxiety should be self-rated as diffuse across many domains, representing HT and PET's conceptualization of the general endogenous propensity for maladaptive biased cognitive over-processing of evaluative threat shared by trait anxious individuals and those with GAD. Individuals who exhibit comparatively narrow and few worry domains concomitant with stress, would be uncharacteristic of GAD's worry component, regardless of their degree of trait anxiety. This distinction indicates that number of worries, worry breadth, and worry domains are relevant to differences in threat perception and subsequent processing within a specific anxious population.

Current research (Flett & Blankstein, 1994) suggests that for trait anxious students, testing should be one of many excessive worry-producing situations--in this case, worry as a threat-response to the task of successfully completing a scholastic evaluation. Based on this

assumption worry in test anxiety, as a channel of their anxious responding, should conform to a number of the currently defined attributes of worry observed in high trait anxious individuals in general.

Furthermore, within the theoretical framework of Eysenck's HT and PET, these shared attributes of worry are empirically related to the expression of GAD in clinically diagnosed persons (Borkovec & Inz, 1990). As such, trait anxiety, test anxiety, and measures of GAD worry should possess a basic relationship and similar cohesive structure of diffuse ruminative thoughts. These thoughts should be measurable as excessive and uncontrollable worry on reliable self-report assessment instruments. In trait anxious individuals, it is assumed that it is uncharacteristic for worry to be about narrowly focused concerns, but rather characterized by diffuse perseverating and intrusive thoughts across many areas of personal experience.

This study suggests that a careful investigation of the relationship between the nature of worry in test anxious individuals and the nature of worry as indicative of possible GAD vulnerability is warranted. In the case of trait anxious students who have test anxiety but do not cope well, latent vulnerability to GAD may be characterized by worrisome, intrusive GAD-like thoughts. The GAD vulnerable student's worrying reflects the unmitigated incursion of threat-related evaluation fear structures as worry

maintained in working memory primed by the perceived threat of impending social evaluation--including test-taking. It is assumed these students would have worrisome thoughts that are both global in nature and span across many life domains compared to trait anxious individuals assessed as having test-anxiety concomitant with the ability to cope. Thus, coping test-anxious individuals will self-report principally narrow worry in fewer domains (e.g., academic worry concerning grades) and will not represent a latent vulnerability to GAD.

Thus, hypervigilant trait anxious individuals with a latent vulnerability to GAD should report significantly more diffusion and breadth of worry across many worry domains when compared to those whose higher ratings on measures of GAD worry (e.g., Penn State Worry Questionnaire, PSWQ; Meyer, Miller Metzger, & Borkovec, 1990) reflect a GAD-correlated, high level of global anxious responding. Furthermore, hypervigilant trait anxious individuals should also score higher on domains of worry measures (e.g., Anxious Thoughts Inventory, AnTI; Wells, 1994a) revealing a significantly broader arena of concerns (unfocused breadth), when contrasted with coping individuals representing significantly fewer and more context-specific concerns as evaluative threat--such as an upcoming test.

An anxiety-moderating influence that may be representative of the coping skills referred to by Eysenck

(1992) and further developed in the current study, is meaningfully represented by the construct of "*Constructive Thinking*" (Epstein, 1990) and measured by Epstein's Constructive Thinking Inventory (CTI: Epstein & Meier, 1989). In their recent study employing the CTI, Epstein and Katz (1992) point out that "Constructive thinking is defined as the ability to solve problems in everyday life at a minimum cost in stress" (p. 813). The CTI has one global coping factor along with six reliable sub-factors; Emotional Coping, Behavioral Coping, Categorical Thinking, Personal Superstitions Thinking, Esoteric Thinking, and Naive Optimism. The global coping factor and six sub-factors assess a general coping ability, not how individuals deal with stress.

The CTI should distinguish between dispositionally trait anxious individuals who have acquired a general ability to cope while in college, but do not do well on tests, and those whose broader dimension of worry persists in the absence of this ability. Importantly, the relationship between the CTI and a latent vulnerability to GAD is hypothesized as a characteristic of cognitively coping with the demands of scholarship and responding to relatively ambiguous stimuli without subsequent anxious arousal.

This study's hypothesized theoretical relationship between the structured academic learning environment's

capacity to produce a global coping ability as measured by the CTI and a moderation of trait anxious worry in general, is relevant to its investigation of Eysenck's GAD latent vulnerability factor. This theoretical relationship is the central component of the investigation's general exploratory and descriptive element involving the possible mitigating effects of coping with anxious responding when worry is considered the cognitive element of anxiety. However no mechanism tying individual differences in the scope and nature of trait anxious worry to that moderation is considered. It is likely that the inclusion of this general exploratory and descriptive element will result in valuable collaborative support by providing information resulting from data generated through concurrent CTI measurement. This contribution is well within the purview of the theoretical models employed in this discussion of vulnerability to GAD.

By integrating the possible relationship between coping and Eysenck's latent vulnerability to GAD, this study seeks to establish the importance of considering the breadth of worry in test anxious college populations within this context. Specifically, there should be significant differences in social responding. Furthermore, these differences should relate to differences in cognitive coping, measurable with the CTI: high trait anxious test anxious individuals rating high on Constructive Thinking and

rate low on the DSM-ADIS measures of global worry should rate significantly lower on measures of social phobia and the FNE compared to trait anxious test anxious individuals rating low on Constructive Thinking and rating high on the ADIS-DSMIV measures of global worry. These findings would represent initial support for Eysenck's conclusion that intrasocial elements can be linked to GAD vulnerability through predictions generated by Hypervigilance Theory and Processing Efficiency Theory.

METHOD

Participants

The study's participant pool ($n = 353$) was from a southern California community college student population enrolled in regular classes scheduled during a normal academic-year semester. Participant's characteristics concerning anxiety were unselected.

The mean age of those 352 participants reporting age was 23 years. Of those reporting gender ($n = 352$); 214 (61%) were women and 138 (39%) were men, with 1 case missing. For those reporting annual income ($n = 335$); 219 (57.3%) were under \$10,000, 40 (11.3%) were between \$10,001 and \$15,000, 18 (5.1%) were between \$15,001 and \$20,000, 17 (4.8%) were between \$20,001 and \$25,000, 4 (1.1%) were between \$25,001 and \$30,000, 10 (2.8%) were between \$30,001 and \$35,000, 7 (2.0%) were between \$35,001 and \$45,000, 20 (5.7%) were above \$45,000, with 18 (5.1%) missing. Of those reporting race ($n = 349$); 200 (56.7%) were Caucasian (or White), 78 (22.1%) were Hispanic, 33 (9.3%) were African American (or Black), 25 (7.1%) were Asian (or Asian American), 3 (0.8%) were Native American (or American Indian), 10 (2.8%) were Other, with 4 (1.1%) missing.

Procedure

Survey packets were distributed in class during normal class hours following a brief presentation to familiarize

the participants with the packet's self-report Likert-type scales and printed instructions. It was assumed that assessment of test-anxiety as well as other anxiety-related constructs by self-report would have enhanced reliability if testing were a salient attribute of the participant's environment. As a result, all surveys were distributed during a class session taking place 3 to 7 days before an examination scheduled for that class. All testing was regularly scheduled on the class syllabus. All participants were given extra credit for the instrument packet's completion. The amount of extra credit was determined in advance of and was uniform across survey-data collection.

Dependent Measures

Anxious Thoughts Inventory (AnTI; Wells, 1994a). The AnTI is a 22 item, five point (1-5) Likert-type scale designed to assess worry in three domains; social worry, health worry, and meta-worry (defined as conscious concern over worry). Wells (1994a) reports the scale as having good internal consistency (Cronbach's alpha = .80).

Constructive Thinking Inventory Short Form (CTI-S; Epstein & Meier, 1989).

The CTI-S is a 52 item, five point (1-5) Likert-type scale designed to assess global coping ability. Published 1994 norms indicate good internal consistency (Cronbach's alpha = .80).

Brief Fear of Negative Evaluation Questionnaire (BFNE; Watson & Friend, 1969).

The BFNE is a 12 item, 5 point (1-5) Likert-type scale designed to assess threat-related fear/anxiety responding in evaluative social situations, with scores ranging from 0 to 30; higher scores indicating greater perceived social-evaluative threat. The scale is reported as having good internal consistency (KR-20 = .94) (Corcoran & Fischer, 1987).

Social Avoidance and Distress Scale (SADS; Watson & Friend, 1969).

The SADS is a 28 item true-false inventory designed to assess the avoiding of social situations due to the anxious and fearful distress experienced in those situations, with scores ranging from 0 to 28; higher scores indicating greater anxious avoidance and social distress. The scale is reported by Corcoran and Fischer (1987) as having excellent internal consistency (Formula KR-20 = .94).

State-Trait Anxiety Inventory - Form Y (STAI Form Y-1 & STAI Form Y-2); Spielberger, 1983).

The STAI Form Y-1 (state) and the STAI Form Y-2 (trait) anxiety inventories are 20 item, four point (1-4), Likert-type scales. Form Y-1 is designed to assess the situation and time specific elements of anxiety—referred to as state anxiety. Form Y-2 is designed to assess enduring dispositional anxiety-proneness—referred to as trait

anxiety. Scores for the scales range from 20 to 80 with higher scores indicating greater perceived anxiety. Spielberger (1983) reports excellent reliability for both Form Y-1 (Cronbach's alpha = .925) and Form Y-2 (Cronbach's alpha = .905).

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990).

The PSWQ is a 16 item, five point (1-5) Likert-type scale designed to assess worry as a component of experienced anxiety. Scores range from 16 to 80 with higher scores indicating greater perceived anxious worry. The PSWQ has excellent reliability with Cronbach alphas in the 90s (Paulhus, 1987).

Test Attitude Inventory (TAI; Spielberger, Gonzalez, Taylor, Algaze, & Anton, 1978).

The TAI is a 20 item, four point (1-4) Likert-type scale designed to assess test-anxiety. Scores range from 20 to 80 with higher scores indicating greater test-anxiety. The TAI has reported KR-20 reliability alphas of .92.

Social Phobia and GAD Self Report ADIS-IV

This scale was developed by Mettrick and Lewin as a verbatim reconstruction of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown, DiNardo, & Barlow), used to diagnose Social Phobia and GAD. The ADIS-IV is a clinical assessment instrument designed to be administered as a structured interview providing detailed information

specific to a disorder's DSM-IV description and requisite criterion. The primary function of the ADIS-IV is to augment the therapists' determining the nature and the severity of an individual's presenting dysfunction.

The Social Phobia and GAD Self Report ADIS-IV is comprised of two sections; one devoted to the assessment of Social Phobia (Social Phobia ADIS-IV) the other is devoted to the assessment of GAD (GAD ADIS-IV).

The Social Phobia ADIS-IV section is comprised of 3 subsections termed Social Evaluation, Social Anxiety, and Social Avoidance. Subsection items are eight point Likert-type scale with descriptors labeled "not at all," "moderately," and "extremely." The section is designed to assess Social Phobia as anxious responding in social surroundings, higher scores denoting greater perceived anxiety.

The Social Evaluation subsection is comprised of 3 items that assess general aspects of anxious social perceptions as evaluative concerns (e.g. 'when you're in social situations where others could be evaluating you or when you meet new people, do you feel fearful, anxious, or nervous').

The Social Anxiety subsection is comprised of 12 items that assess the severity of anxiety as affect the individual would experience in response to a specific social situation (e.g., being at a party, speaking in public). Below a

general measure description asking; "Here are some situations. How anxious would you feel in each situation-- and if you found yourself making a decision about doing this thing [sic] when anxious would you do it or avoid it?" is positioned a restatement asking; "How anxious would you feel if you found yourself in a situation where you might be:" This restatement precedes the list of 12 situation-specific items (e.g., being at a party, speaking in public).

Directly below each of the listed 12 Social Anxiety item, is placed the corresponding Social Avoidance item. Each of the 12 Social Avoidance items is preceded by a question that asks "when anxious would you avoid this?" This question is in reference to the described social situation (e.g., being at a party, speaking in public).

The GAD subsection is comprised of 12 items designed to assess worry as the principle cognitive component in GAD. Each item targets one of 12 specific life-domain areas of worry (e.g., being on time, fitness and health). Each life-domain worry area item incorporates four embedded subscales. In the order in which presented, these embedded subscales are labeled; GAD - Worry Frequency, GAD - Worry Breadth, GAD - Uncontrolled Worry, and GAD - Excessive Worry.

The GAD - Worry Frequency subscale is an 8 point numeric index assessing the number of worries the participant experienced per week over the last six months in the specified life-domain worry area. Below a written

description of the life-domain worry area (e.g., your academic performance, your concern over minor matters/little things), is a question asking; "How often you were worried..." Place directly to the right is a sequential numeric index consisting of eight numbers in a horizontal string with anchors 0 and 7, descriptors labeled "never," "seldom," and "all the time"; the number indicating the corresponding equivalent number of worries.

The GAD - Worry Breadth subscale is dichotomous forced-choice and is designed to assess the diffuse breadth of the individual's worry content in the specified life-domain worry area being assessed. The GAD - Worry Breadth subscale is placed immediately below the GAD- Worry Frequency measure. To the immediate right of the subscale description asking "Was your worry content" are two boxes located horizontally side by side, with headings placed directly above the boxes labeled focused on the left and wide on the right.

Located beneath The GAD - Worry Breadth subscale, are the GAD - Uncontrolled Worry, and GAD - Excessive Worry subscales. The two subscales are designed to assess the degree to which anxious worry in the described worry life domain is experienced as uncontrollable and excessive. To the immediate right of a subscale description question asking "was the nature of your worry" are placed two eight point (0-7) Likert-type scales in vertical column alignment.

The first scale is preceded by the term Uncontrolled, the second scale is preceded by the term Excessive. Item descriptors are labeled "not at all," "moderately," and "extremely." Higher scores denote greater perceived anxious worry in the life domain being assessed.

Predictions

Utilizing community college norms published in the Preliminary Professional Manual for the Test Attitude Inventory (TAI: Spielberger, 1980), self-reported ratings of test anxiety as measured by the Test Attitude Inventory (TAI; Spielberger, Gonzalez, Taylor, Algaze, & Anton, 1978) will be used to segment the participant pool into two groups. The 80th percentile groupings of women and men will be employed. The upper 20% will be considered high test anxious individuals and the lower 80% will be considered low test anxious individuals. All comparisons will utilize only high test anxious individuals.

1. High test anxious students will also be high trait anxious as measured by the Trait Anxiety Inventory (STAI Form Y-2; Spielberger, 1983).
2. High Test / Trait Anxious (HT/TA) individuals can be differentiated into two groups based upon significant differences in their mean ratings on the GAD - Excessive Worry subscale.

Those individuals rating themselves as having significantly higher comparative ratings on the

GAD - Excessive Worry subscale will be termed GAD worriers with test anxiety and those having significantly lower comparative ratings will be termed HT/TA worriers.

3. Prediction number three addresses qualitative and quantitative differences in the nature of worry experienced by GAD worriers with test anxiety and High Test / Trait Anxious worriers.

A means comparisons between GAD worriers with test anxiety and HT/TA worriers will reveal the following:

A. GAD worriers with test anxiety will rate significantly higher than HT/TA worriers on two self-report measures associated with GAD; the PSWQ and the ANTI.

B. GAD worriers with test anxiety will rate significantly higher than HT/TA worriers on number of domains of worry as measured by the Number of Worries Per-Week sub-scales and Uncontrollable Worry sub-scales of the GAD Self Report ADIS-IV.

C. GAD worriers with test anxiety will rate significantly lower than HT/TA worriers on global cognitive coping as measured by the CTI.

4. Prediction four addresses differences between the two groups on measures of Social Phobia.

GAD worriers will rate significantly higher than HT/TA worriers on measures of social phobia as measured by the SAD, SFNE, and the social phobia scales of the Social Phobia and GAD Self Report ADIS-IV.

RESULTS

Univariate Data Screening

All analyses utilized SPSS v.8.0. All variables were examined for accuracy of data entry and missing values. Missing values were assessed during composite scale construction and were replaced with the mean value.

All assessment scales were analyzed for fit between their distributions and the assumptions of univariate analysis. For all scale items, no values were identified as significant univariate outliers (values < 3.3 SDs, $p < .001$). The AnTI, BBDI, CESD, PSWQ, SAD, STAI-Y1, SFNE, and the TAI were skewed in the range of 3.3 to 3.9 standard deviations. These scales were retained untransformed due to the importance of preserving extreme values.

Scale Construction

A: Scale Construction of the GAD Self Report ADIS-IV Number of Worries & Uncontrollable Worries Subscales

Two separate principle factor extractions with oblique rotation were performed on response items that comprised the Number of Worries & Uncontrollable Worries subscales of the Self Report DSM AIDS-IV for the sample of 353 participants. Principle components extraction was used prior to principle factors extraction to estimate number of factors, presence of outliers, absence of multicollinearity, and factorability of the correlation matrices.

The principle components extraction procedure of Number

of Worries subscale (the number of worries per week experienced in the life domain area) revealed adequate factorability (Kaiser-Meyer-Olkin-measure of sampling adequacy = .895) and no evidence of collinearity. With an $\alpha = .001$ cutoff 9 of the 353 participants produced scores that identified them as outliers and were deleted from principle factors extraction.

Three factors were extracted with corresponding Eigenvalues of 4.920, 1.013, and .924 (see Table 1). These three factors accounted for 57% of the item response variance. With a cut off of .30 for inclusion of a variable in interpretation of a factor one variable did not load on a factor (number of worries per week concerning peers/friends). Scale reliability analysis for all items in their respective factors revealed that the deletion of item 6 (social worries) from Factor 2 increased the reliability for this factor from alpha = .75 to alpha .78. This increase was not considered sufficient to warrant the item's removal. Thus, all retained items in their respective factor scales were utilized. Factor 1 (labeled Lifestyle Worries) consisted of worries concerning academic performance, the participant's health, the participant's appearance, the participant's finances, the participant's family and the participant's being on time. Factor 2 (labeled Distracting Worries) consisted of worries

concerning minor matters/little things, lots of details, and the participant's social performance. Factor 3 (labeled Extra-Social Worries) consisted of worries concerning others' health and worries about the community or world affairs. Alphas for these scales were Factor 1 = .81, Factor 2 = .78, and Factor 3 = .59.

The principle components extraction procedure of Uncontrollable Worries subscale items (the extent to which worries in the life domain areas were uncontrollable) revealed adequate factorability (Kaiser-Meyer-Olkin-measure of sampling adequacy = .9215) and no evidence of collinearity. With an $\alpha = .001$ cutoff, 13 of the 353 participants produced scores that identified them as outliers and were deleted from principle factors extraction.

Table 1. Factor Loading of Three Factors: Number of Worries Per Week Across Life Domain ($n = 344$)

<u>Life Domain</u>	<u>Factor Number</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Academic Performance	.731	-.0582	-.173
Fitness and Health	.688	.0682	.194
Physical Appearance	.570	-.0728	.104
Finances	.501	-.0212	.0241
Family	.481	.0768	.206

Being on Time	.419	-.293	-.0615
Minor Matters and Little Things	-.0521	-.806	.0034
Lots of Detail	.0124	-.749	.6722
Social Performance	.193	-.345	.143
Other's Health and Fitness	-.0366	-.162	.651
Community and World Affairs	.138	-.0133	.380
Peers and Friends	.138	-.249	.271

Three factors were extracted with corresponding Eigenvalues of 6.457, .968, and .798 (see Table 2). These three factors accounted for 68.5% of the item response variance. With a cut off of .30 for inclusion of a variable in interpretation of a factor, all variables loaded on a factor. Scale reliability analysis for all items in their respective factors revealed that no item deletions increased any factor's reliability. Thus, all items were retained and utilized in their respective factor scales. Factor 1 (labeled External Worries) consisted of worries concerning lots of details, minor matters/little things, the participant's being on time, worries about the community or world affairs, the participant's peers and friends, others' health, and the participant's social performance. Factor 2 (labeled Pragmatic Worries) consisted of worries concerning the participant's finances, the participant's family, and

the participant's academic performance. Factor 3 (labeled Internal-Self Worries) consisted of worries concerning the participant's appearance and the participant's health.

Alphas for these scales were Factor 1 = .88, Factor 2 = .80, and Factor 3 = .88.

Table 2. Factor Loading of Three Factors: Uncontrollable Nature of Worry in Life Domain (n = 340)

<u>Life Domain</u>	<u>Factor Number</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Lots of Details	.845	-.0036	-.0493
Minor Matters and Little Things	.818	-.0709	-.103
Being on Time	.751	-.0157	.0241
Community and World Affairs	.589	.0260	-.0316
Peers and Friends	.498	.248	.0968
Other's Fitness and Health	.436	.0516	-.237
Social Performance	.338	.292	-.208
Finances	-.0897	.803	-.0787
Family	.126	.697	.0559
Academic Performance	.079	.595	-.113
Fitness and Health	.0187	.0848	-.828
Physical Appearance	.0806	.0161	-.817

B: Scale Construction of GAD Self Report ADIS-IV
Excessive Worry Subscale

Principle components extraction was used prior to principle factors extraction to estimate number of factors, presence of outliers, absence of multicollinearity, and factorability of the correlation matrices.

With an $\alpha = .001$ cutoff 19 of the 353 participants produced scores that identified them as outliers and were deleted from principle factors extraction.

Investigation of the correlation matrix prior to factor analysis revealed uniformly high levels of item correlations. This was confirmed during principle factors analysis. Only one factor was extracted due to multicollinearity and singularity.

Subsequent scale reliability analysis of all twelve items comprising measure 4 revealed that no deletion of items improved scale reliability. Thus, all twelve items were retained to create an Excessive Worry Scale. Alpha for this scale was .92.

C: Scale Construction of Social Phobia Self Report
ADIS-IV Social Anxiety and Social Avoidance Subscales

Two separate principle factor extractions with oblique rotation were performed on response items that comprised Social Anxiety and Social Avoidance Subscales of the Social Phobia Self Report ADIS-IV for the sample of 353

participants. Principle components extraction was used prior to principle factors extraction to estimate number of factors, presence of outliers, absence of multicollinearity, and factorability of the correlation matrices.

The principle components extraction procedure of Social Anxiety subscale items (perceived anxiousness when engaging in specific social activities) revealed no evidence of collinearity and adequate factorability (Kaiser-Meyer-Olkin-measure of sampling adequacy = .905). With an $\alpha = .001$ cutoff, 10 of the 353 participants produced scores that identified them as outliers and were deleted from principle factors extraction.

Three factors were extracted with corresponding Eigenvalues of 6.215, 1.740, and .831 (see Table 3). These three factors accounted for 73% of the item response variance. With a cut off of .30 for inclusion of a variable in interpretation of a factor, all variables loaded on a factor. Scale reliability analysis for all items in their respective factors revealed that no item deletions increased any factor's reliability. Factor 1 (labeled Inter-Personal Social Concerns) consisted of a perceived anxiety concerning attending a party, speaking with unfamiliar people, speaking with people in authority, being assertive (refusing unfair requests), initiating a conversation and maintaining a conversation. Factor 2 (labeled Social Exposure Concerns)

consisted of a perceived anxiety concerning eating in public, using a public restroom, and writing in public/using ATM. Factor 3 (labeled Extra-Personal Social Concerns) consisted of a perceived anxiety when formally speaking in front of people and performing at meetings/classes. Alphas for these scales were Factor 1 = .92, Factor 2 = .80, and Factor 3 = .86.

Table 3. Factor Loading of Three Factors: Social Anxiety When Engaged in a Specific Activity ($n = 343$)

<u>Activity</u>	<u>Factor Number</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Initiating a conversation	.956	-.0685	-.0817
Maintaining a conversation	.906	.0036	.0985
Speaking with people in authority	.713	-.0157	.0241
Dating situation	.707	.0262	-.0974
Being assertive	.659	.0597	.0968
Attending a party	.632	.105	.150
Speaking with unfamiliar people	.338	.292	-.208
Using an ATM	.517	.0256	.330
Using a public restroom	-.0378	.868	.0582
Eating in public	-.0310	.721	-.0535

Speaking formally in front of a group	.260	.593	-.0166
Performing in a class situation	.0206	.0693	.842

The principle components extraction procedure of Social Avoidance subscale items (avoidance of specified social activities) revealed no evidence of collinearity and adequate factorability (Kaiser-Meyer-Olkin-measure of sampling adequacy = .894). With an $\alpha = .001$ cutoff, 9 of the 353 participants produced scores that identified them as outliers and were deleted from principle factors extraction.

Three factors were extracted with corresponding Eigenvalues of 5.983, 1.388, and .960 (See Table 4). These three factors accounted for 69% of the item response variance. With a cut off of .30 for inclusion of a variable in interpretation of a factor, all variables loaded on a factor. Scale reliability analysis for all items in their respective factors revealed that no item deletions increased any factor's reliability. Factor 1 (labeled Inter-Personal Social Avoidance) consisted of a perceived anxiety concerning attending a party, speaking with unfamiliar people, speaking with people in authority, being assertive (refusing unfair requests), initiating a conversation and maintaining a conversation. Factor 2 (labeled Social Exposure Avoidance) consisted of a perceived anxiety concerning eating in public, using a public restroom, and

writing in public/using ATM. Factor 3 (labeled Extra-Personal Social Avoidance) consisted of a perceived anxiety when formally speaking in front of people and performing at meetings/classes. Alphas for these scales were Factor 1 = .90, Factor 2 = .70, and Factor 3 = .89.

Table 4. Factor Loading of Three Factors: Social Avoidance of a Specific Activity When Feeling Anxious $n = 344$)

<u>Activity</u>	<u>Factor Number</u>		
	<u>1</u>	<u>2</u>	<u>3</u>
Maintaining a conversation	.951	-.0964	-.0594
Initiating a conversation	.877	-.0738	.0488
Being assertive	.717	.0617	-.0564
Speaking with people in authority	.593	.154	.108
Dating	.514	.236	.102
Attending a party	.424	.103	.247
Using an ATM	-.0301	.770	.0239
Eating in public	.131	.616	.0334
Using a public restroom	-.0378	.868	.0582
Speaking formally in front of a group	-.0296	.580	-.0411
Performing in a class situation	.0048	-.0607	.905
Speaking with unfamiliar people	.391	.121	.404

Testing of Hypotheses

Analyses and Classification of High Test Anxious/ Trait Anxious Individuals

To identify participants who were high test anxious students, participants were grouped according to normed scores for the 80th percentile (Women \bar{M} = 53.00, Men \bar{M} = 47.00) published in the Preliminary Professional Manual for the Test Attitude Inventory (TAI: Spielberger, 1980). Participant 80th percentile norms for this sample were Women \bar{M} = 59.00, Men \bar{M} = 50.00.

Separate One-way Analyses of Variance (ANOVAs) indicated that the Upper 20th percentile and Lower 80th Percentile Test Anxious groups differed significantly on a comparison of scores on the Spielberger State-Trait Anxiety Inventory (See Table 5). Those individuals in the Upper 20th percentile rated significantly higher on both State and Trait Anxiety as measured by the STAI Forms Y-1 (State) and Y-2 (Trait) when compared to individuals in the Lower 80th percentile.

Participant mean scores on the STAI Y-2 for Women (\bar{M} = 49.17) and for Men (\bar{M} = 45.83) corresponded to the 83rd and 80th percentile respectively for college students' scores on the STAI Y-2 published in the Manual for the State-Trait Anxiety Inventory (Spielberger, 1983).

As a result, those participants rating in the upper 20th percentile of the TAI (n = 96) were selected as

representative of a study population with high test and high trait anxiety and are referred to as High Test / Trait Anxious (HT/TA). Only HT/TA participants' scores on assessment instruments of interest were utilized in subsequent analyses.

Table 5. Differences in Mean Ratings of the Test Attitude Inventory (TAI) Upper 20th Percentile Group ($n = 96$) Compared to the Lower 80th Percentile Group ($n = 257$): STAI Forms Y-1 (State) and Y-2 (Trait).

Measure	df(1,351)	F	Sig	TAI Group				
				Lower 80 th %		Upper 20 th %		
			M	SD	M	SD		
STAI Y-1 (State)		32.91	.001	33.40	11.86	41.68	12.61	
STAI Y-2 (Trait)		58.22	.001	38.42	10.42	48.02	10.76	

Classification of GAD and HT/TA Worriers

As an exploratory procedure, Hierarchical Cluster Analysis with Wards method of classification was employed to investigate the grouping of scores on the Excessive Worry Subscale developed from the GAD section of the DSM ADIS-IV Self-Report. An inspection of the dendogram produced by this procedure revealed that 2 groups could be distinguished based upon participants' self report of excessive worry.

Following the exploratory Hierarchical Cluster analysis, a K-Means Cluster was utilized to create a final

classification of participants into 2 groups based upon their total expressive worry scores. Missing data for 2 of the 96 cases were replaced with mean scores. Convergence of participant ratings on the Excessive Worry Scale used to establish Cluster Centers was achieved in 2 iterations with the Distance between Final Cluster Centers = 28.38 (Cluster 1 Center = 20.22; Cluster 2 Center = 48.59). A One-way Analysis of Variance of the group means suggested that Cluster Centers did differ significantly, $F(1,94) = 194.74$, $p < .001$. Cluster 1 was labeled individuals with High Test/Trait Anxiety (HT/TA) worry ($n = 46$). Cluster 2 was labeled with GAD Worry ($n = 50$).

A direct Discriminant Function Analysis was performed using the entire 12 excessive worry items of the DSM ADIS-IV GAD section as predictors for the High and Low GAD Worry groups. The discriminant function grouped 49 (98%) of the 50 individuals into the category previously determined by K-Means Cluster Analysis as HT/TA Worry and all 46 cases (100%) into the previously determined category GAD Worry based upon their scores of the 12 excessive worry items. Overall, the discriminant function classified 95 of the 96 cases (99%) into the groups previously established by the K-Means Cluster Procedure.

Differences in DSM - IV Worry Domains, Qualitative Worry, and CTI Global Coping

To assess differences between the GAD and HT/TA worrier

groups in quantitative and qualitative aspects of worry. One-way Analyses of Variance (ANOVAs) were performed (see Table 6).

To investigate differences in the number and breadth of GAD worry-domain, comparisons were made between GAD and HT/TA worriers on the ANTI, and Routine, Distracting and Extra-Social Factors of the GAD ADIS-IV Self Report Number of Worries Subscale.

To investigate differences in the qualitative aspects of GAD worry, comparisons were made between GAD and HT/TA worriers on PSWQ and the Extra-Self, Privacy, and Intra-Self Factors of the GAD ADIS-IV Self Report Uncontrollable Nature of Worry Subscale.

To investigate differences in global coping with stress, comparisons were made between GAD and HT/TA worriers on the CTI Global Coping.

Table 6 indicates that all differences on assessment measures of GAD breadth of worry domains and GAD worry were significantly higher for those in the GAD Worry group compared to those in the HT/TA Worry group.

However, on the CTI measure of global cognitive coping, those in the GAD Worry group rated significantly lower than the HT/TA Worry Group.

Table 6. Differences Between GAD Worriers and High Test/
 Trait Anxious Worriers on Mean Ratings of the GAD DSM ADIS -
 IV Self Report Life Domain Number of Worries and
 Uncontrollable Worry Subscale Factors, AnTI, PSWQ, and the
 CTI Global Coping Scale. (df, 1,94)

<u>Numbers of Worry</u>	<u>Worry Group</u>						
				<u>HT/TA</u>		<u>GAD</u>	
<u>Subscale Factor</u>	<u>F</u>	<u>Sig</u>	<u>η²</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Routine	32.18	.001	.231	4.07	1.15	5.28	.89
Distracting	48.32	.001	.329	2.82	1.45	4.72	1.18
Extra-Social	12.80	.001	.108	2.83	1.23	3.79	1.36
<u>Uncontrollable Worry</u>							
<u>Subscale Factor</u>	<u>F</u>	<u>Sig</u>	<u>η²</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Extra-Self	87.99	.001	.499	1.61	1.06	3.71	1.12
Pragmatic	51.22	.001	.352	2.53	1.50	4.59	1.27
Intra-Self	56.85	.001	.352	1.97	1.53	4.35	1.53
<u>AnTI</u>	26.30	.001	.218	64.15	16.29	48.98	12.18
<u>PSWQ</u>	25.37	.001	.214	58.41	10.14	47.31	11.18
<u>CTI-GLOBAL</u>	23.16	.001	.191	55.52	9.28	46.46	8.97

Differences in DSM - IV Social Phobia and Fear of
 Negative Social Evaluation

To assess differences in anxious social responding
 between the GAD and HT/TA worrier groups, One-way Analyses

of Variance (ANOVAs) were performed (see Table 7).

Table 7. Differences in Mean Ratings Between GAD Worriers and High Test / Trait Anxious Worriers: Social Phobia DSM ADIS - IV Self Report Social Evaluative Items, Social Anxiety, and Avoidance Concerns Subscales; BFNE, and SADS. (df 1,94)

				<u>Worry Group</u>			
				<u>HT/TA</u>		<u>GAD</u>	
<u>Social Evaluation</u>							
<u>Evaluation Item</u>	<u>F</u>	<u>Sig</u>	<u>η^2</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Social Evaluation	6.70	.011	.070	4.35	2.17	5.49	2.03
Social Interaction	5.76	.018	.060	4.55	2.11	5.53	1.78
Trait Social Evaluation	5.04	.027	.055	5.50	2.03	6.36	1.54
<u>Social Anxiety</u>							
<u>Subscale Factor</u>	<u>F</u>	<u>Sig</u>	<u>η^2</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Inter-Personal	21.14	.001	.170	3.03	1.58	4.50	1.53
Privacy	7.32	.007	.073	1.53	1.83	2.62	1.98
Extra-Personal	31.59	.001	.262	2.50	1.53	4.18	1.37
<u>Social Avoidance</u>							
<u>Subscale Factor</u>	<u>F</u>	<u>Sig</u>	<u>η^2</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Inter-Personal	13.91	.001	.125	2.23	1.70	3.47	1.51
Privacy	9.60	.003	.091	1.13	1.57	2.22	.82
Extra-Personal	8.22	.005	.085	2.68	2.28	3.95	1.99

<u>BFNE</u>	14.42	.001	.130	33.78	7.65	40.20	8.22
<u>SAD</u>	10.21	.002	.105	9.02	7.23	14.49	8.81

To reveal underlying differences in Social Phobia's Anxiety component, comparisons were made between Gad and HT/TA worriers on ratings of the Inter-Personal, Privacy, and Extra-Personal Factors of the GAD ADIS-IV Self Report Social Anxiety Subscale.

To investigate differences in Social Phobia Avoidance, comparisons were made between Gad and HT/TA worriers on ratings of the Inter-Personal, Privacy, and Extra-Personal Factors of the GAD ADIS-IV Self Report Social Avoidance Subscale, and the Fear of Negative Social Evaluation Brief Form.

As illustrated by Table 7, all differences on the Social Phobia Anxiety Factors and Social Phobia Avoidance Factors were significantly higher for GAD worriers in comparison to HT/TA worriers.

Ratings on the Brief Fear of Negative Social Evaluation revealed that GAD worriers rated significantly higher on Fear of Negative Social Evaluations compared to HT/TA worriers.

DISCUSSION

This study's findings are in accord with the theoretical position that worry as the cognitive component of anxiety may represent an endogenous negative processing bias for evaluation as threat. It was assumed that a stressful environment would contribute to increased levels of worry and so, facilitate self-report of that worry. On the basis of this assumption, a population of community college students facing a regularly scheduled exam was utilized. These students were given the Test Attitude Inventory (TAI) to assess their current levels of test anxiety. Normed 80th percentile scores of a similar population from the published manual of TAI were employed to segment this study's participants into low test anxious and high test anxious groups. A means test comparing the high and low test anxious groups revealed that high test anxious participants were rating significantly higher on the State-Trait Anxiety Inventory Forms Y-1 and Y-2 (measuring state and trait anxiety respectively). Thus, in a comparison between the two groups, the high test anxious group reported experiencing significantly greater levels of state-dependent anxiety as well as greater levels of overall anxiety. These reported higher levels among high test anxious participants suggests that predictions concerning differences in the quality and quantity of these individuals' worries should be useful in identifying the degree to which that worry is

similar or dissimilar to anxiety disorder.

In functioning trait-anxious populations, worry elements correlated with anxiety disorder do not necessarily deprive individuals of the ability to perform their day-to-day routines. Research investigating PET suggests that trait anxious individuals dedicate additional processing resources to the maintenance of, rather than the increased efficiency, of performance tasks. Some high test / trait anxious individuals facing a threatening evaluation task could represent increased risk of dysfunction due to their anxiety. This vulnerability should appear as a similarity between their worry numbers and content and the worry numbers and content reported by individuals diagnosed with GAD.

Worry as the cognitive component of anxiety is the central element at work in test anxiety rather than the physiological or behavioral (Spielberger & Vagg, 1995). The narrow and specific nature of the worry incapacitates the individual's ability to perform at adequate levels on a specific cognitive task--participating in a standardized evaluation of what they have learned. As in test anxiety, the cognitive component of anxiety in GAD outweighs the physical or behavioral components--GAD is a cognitive processing disorder. Unlike test anxiety, in GAD diagnoses undifferentiated excessive worry is a defining characteristic of individuals who are GAD-positive.

Thus, HT/TA individuals may be differentiated as GAD or only High Test / Trait Anxious by self-reported levels of excessive worry (as the cognitive component of their anxiety). This prediction stems from two sources. First, Eysenck's (1992) theoretical perspective that stressed high trait anxious individuals possess a negatively biased endogenous threat processing of stimuli, representative of a manifest vulnerability to GAD. Second, research findings indicate that worry, as the cognitive element in anxiety, is a shared central component at work in both test anxiety and GAD. This shared component of worry may differ on measurable qualitative and quantitative dimensions (Spielberger & Vagg, 1995).

Within the Diathesis Stress model of anxiety, excessive worry in high trait anxious individuals is a central element related to Social Phobia, GAD, and vulnerability to both GAD and Social Phobia. Research on the nature of anxiety has shown excessive worry to be significantly related to high levels of endogenous biased threat processing in high trait anxious individuals (Crake, Rapee, Jackel, & Barlow, 1989; Schwarzer, 1996).

Excessive worry is a DSM-IV criterion for establishing clinical levels of GAD present among high trait anxious individuals. This criterion was measured in the current study by the GAD DSM ADIS-IV Self-report Excessive Worry Subscale. Participant ratings on this subscale provided a

basis for the classification of two groups--GAD worriers and HT/TA worriers.

The anticipated utility of measuring a DSM-IV GAD diagnostic criterion for classification purposes is to place high test anxious trait anxious individuals on a continuum. At one end would be the HT/TA individual whose endogenous negative processing-bias of evaluation as threat did not represent a manifest vulnerability to GAD. At the other end would be those whose processing was more closely aligned with a component residing with clinical GAD populations. This measure preserved a fundamental element of GAD shared, in varying degrees, that could form a bridge between those who are only high test / trait anxious and those who may be vulnerable to GAD. Preserving the link between GAD and test anxiety among the groups maintained a direct relationship between the exploration of significant differences between qualitative and quantitative worry dimensions and the theoretical context of HT and PET.

Interestingly, the Excessive Worry Scale emerged as a homogeneous scale due to high inter-item correlations. The high correlations prevented a Factor Analysis of 12 items that eventually were used to comprise the scale. It must be noted that the development of the Excessive Worry Scale in this final homogeneous configuration was unanticipated and serendipitous. Whether the scale is empirically and psychometrically valid in its measurement of excessive worry

per-se is not addressed here. It is the position of this researcher that the Excessive Worry Scale was legitimately employed due to this study's a-priori integration of the DSM ADIS-IV as a measure of GAD worry.

Differentiating HT/TA individuals by their ratings on the Excessive Worry Subscale was a necessary first-step in order to determine important qualitative and quantitative dimensions-of-worry differences in the subsequent groups. The scales inclusion in subsequent analyses reflects the assertion that excessive worry is a central diagnostic element capable of differentiating GAD-like from non GAD-like groups of participants on the basis of their worry. Furthermore the scale's homogeneity and high reliability suggests that ratings correspond to the participant's experience of excessive worry in general. Subscale items asked respondents to indicate their level of excessive worry in the 12 life domains listed in the GAD DSM ADIS-IV. Thus, high ratings on those items reliably indicate the degree to which excessive worry dominates GAD responding in various performance arenas.

A Cluster Analysis was used to classify participants by empirically establishing the similarity in groupings of scores on the GAD Excessive Worry scale. These groupings were then validated through Discriminant Function Analysis correctly classifying 99% of the individuals into their previously established groups. The two groupings were

termed GAD worriers and HT/TA worriers.

It was predicted that GAD worriers would rate higher on reliable measures of GAD and GAD worry when compared to HT/TA worriers. In support of the predictions, those with GAD worry scored significantly higher when compared to HT/TA worriers on the Penn State Worry Questionnaire, the Anxious Thoughts Inventory, all three factors of the Life Domain Number of Worries subscale and all three factors of the Life Domain Uncontrollable Worry subscale. These findings support the hypothesis that a possible relationship exists between some trait anxious individuals and a manifest vulnerability to GAD due to stressed responding increasing negatively biased threat processing.

To illustrate, consider the PSWQ; a measure used to discriminate the degree of worried thought in diagnosed GAD populations (Borkovec, T. D., 1994; Wells, A., 1994a). In addition, the Penn State Worry Group has employed the PSWQ to screen unselected populations for incidence of GAD (Borkovec, T.D., Shadick, R., & Hopkins, M., 1991). The GAD worry group's comparatively higher ratings on this measure provide evidence that their worry content (qualitative content) more closely resembles that of GAD diagnosed individuals and more closely resembles the worry of individuals with undiagnosed GAD in unselected populations relative to those individuals who are High Test / Trait Anxious.

Furthermore, those classified as GAD worriers rated significantly higher compared to those individuals classified as HT/TA on levels of uncontrollable worry--a qualitative GAD-worry dimension. On average, The GAD worry individual reported comparatively greater difficulty controlling worries on established DSM-IV GAD measures. The GAD worry group reported significantly greater difficulty controlling worries that were external in nature, concerned with practical matters, and worries concerning internal self-related issues (e.g., worries concerning lots of details, the community or world affairs, finances and academic performance, and personal appearance). This additional evidence supports the conclusion that qualitative aspects of a stressed, high trait anxious individual's worry may represent a relative increase in vulnerability to GAD.

The GAD worry group also reported quantitative differences in worry compared to the HT/TA group. On average, individuals in the GAD worry group reported comparatively higher levels of worry in domains measured by the AnTI. The GAD worry individuals also reported significantly more worries per week in life areas related to their lifestyle, day-to-day routine, and the larger social world. These findings suggest that compared to high trait anxious individuals with focused concerns over testing, GAD worriers have a considerably greater number and a wider range of anxious ruminative thoughts.

Lastly, the relationship between cognitive coping and manifest vulnerability to GAD in stressed high trait anxious individuals was investigated. The exploratory investigation of cognitive coping as a mitigating factor for the manifest vulnerability to GAD centered on the prediction that GAD worriers would score significantly lower on Epstein's Constructive Thinking Inventory when compared to those individuals classified as having test anxiety concomitant with high trait anxiety. This prediction originates with research that concludes that Constructive Thinking is a measurable component of global cognitive coping with stress (Epstein, S. & Katz, L., 1992; Epstein, S., & Meier, P., 1989). Individuals may experience stress but some will utilize cognitive processes to mitigate a negative impact of stress on performance tasks by implementing increased problem solving without increased stress. It is the perspective of this study that Constructive Thinking may also signify the individual's ability to moderate the impact of stress on thought and so moderate the impact of stress on worry.

Thus, it was predicted that individuals who rated high on instruments that measured the GAD quantitative and qualitative aspects of worry would rate comparatively low on Epstein's Constructive Thinking Inventory (CTI) as a measure of global cognitive coping. In support of this prediction, cognitive coping in GAD worriers as measured by mean scores

on the Global Coping CTI was significantly lower when compared with HT/TA individuals. This finding is interpreted as suggesting the possibility exists that increased cognitive coping as measured by the CTI is a successful compensatory learned response to stress within the framework of PET. GAD worriers may not learn how to use additional processing to mitigate stress and so reduce their GAD worry because they are worried about testing and everything else. By comparison, increased problem solving processing in HT/TA individuals may be targeted on more narrow concerns relatively focused on testing. This comparative narrowing of focus may increase the cognitive "pay-off" when additional attentional resources are dedicated to learning how to learn a strategy allowing HT/TA students to cope with evaluation.

Eysenck (1992) has suggested that manifest vulnerability to GAD in high dispositionally trait anxious individuals may be related to dysfunctional threat responding during social interaction. Threat in these situations is the misinterpretation of ambiguous social stimuli as social evaluative threat concomitant with increased anxiety (in this case measured by GAD worry) and decreased performance levels. The misinterpretation of social interaction as evaluative threat is facilitated and maintained by the high trait anxious individuals' negative cognitive threat-processing bias.

In order to ascertain whether fear of negative social evaluation and social phobia-like responding are implicated in manifest vulnerability to GAD, comparative differences between HT/TA worriers and GAD worriers on measures of social phobia and fear of negative social evaluation were investigated. It was hypothesized that those with a GAD worry component would score significantly higher on these measures when compared to HT/TA individuals.

The findings supported the hypotheses. GAD worriers scored significantly higher on the BFNE, the SAD, the Social Evaluation Items of the Social Phobia ADIS-IV, and the Social Anxiety and Social Avoidance subscales of the Social Phobia ADIS-IV.

Those individuals who were broad and diffuse in their excessive worry, who did not problem solve without increasing their stress, also were significantly impacted by evaluative social concerns as well as evaluative testing concerns compared with those individuals whose excessive worry was significantly more constrained and focused on testing. GAD worriers responded significantly higher on comparative ratings of questions that asked them whether they felt ill-at-ease in social situations, were concerned with other's forming unfavorable impressions, were affected by someone's judging them, and the extent to which they were fearful in " ... social situations where others could be evaluating you ..."

When rating their anxious feelings in situations that required their active involvement, GAD like worriers responded significantly higher compared to HT/TA individuals. On average, the GAD worriers rated higher than HT/TA worriers on Inter-Personal Social Concerns (attending a party, speaking with unfamiliar people, speaking with people in authority, being assertive (refusing unfair requests), initiating a conversation and maintaining a conversation), Social Exposure Concerns (eating in public, using a public restroom, and writing in public/using ATM), and Extra-Personal Social Concerns (formally speaking in front of people and performing at meetings/classes). GAD like worriers responded significantly higher compared to HT/TA individuals when rating their affiliated behavioral avoidance in these situation due to their anxious feelings.

Taken together these data suggest that characteristics present in high dispositionally trait anxious individuals are also present in high test anxious community college students. When excessive worry is used to differentiate between groups of high test anxious / trait anxious students, a corresponding element related to GAD worry as threat processing and lowered global ability to cope with stress emerges. This assertion is made more plausible given the size of the corresponding values of eta squared of the means tests of differences between groups on those measures utilized in determining these differences. There is also

evidence that the fear of negative social evaluation is relevant to the investigation of manifest vulnerability to GAD.

Individuals with GAD worry showed a comparative greater number of concerns in the arena of Social Phobia and social evaluation fear. A primary component of test anxiety is fear of negative evaluation. Test anxious students see testing as an evaluative process whose outcome may mean negative social performance judgments. However, compared to the GAD worry group, HT/TA individuals did not augment their concern over testing with increased worry about social avoidance or social-phobic anxious thoughts. It may be that these individuals' focus on learning provides a central theme with which to maintain stability over performance. Thus a poor test is only as threatening as the grade it represents, rather than representing one more areas of poor performance in the student's social life.

This study began by postulating that for some high trait anxious individuals the structure provided by the academic environment may serve as a prophylactic for the manifest vulnerability to GAD. A self report measure of excessive worry was employed to investigate qualitative and quantitative dimensions of anxious ruminative thoughts. Findings concerning these differences were in accord with the study's predictions stemming from Eysenck's Hypervigilance and Processing Efficiency Theory. The

results are interpreted to suggest that the scope of worry in high test / trait anxious individuals may correspond to a comparative degree of dysfunction in cognitive and social performance.

A final and exploratory effort of this investigation was to hypothesize that comparative ratings on Constructive Thinking (Epstein & Meier, 1989) would be higher in those individuals whose worry was more focused and less broad-- whose worry was constrained in areas directly related to GAD, Fear of Negative Social Evaluation, and Social Phobia. The findings supported the hypothesis. This support led to a preliminary interpretation that the global ability to solve problems without increasing stress may be related to increased competency during stressful social interaction and lower vulnerability to GAD.

Importantly, Eysenck (1992) has observed that worry concerning social performance dominates anxious thoughts in clinical GAD populations. He suggests that worry concerning social performance may be an unexplored element in a stress-diathesis model of manifest vulnerability to GAD. Eysenck states that GAD may result from an endogenous negative processing bias of ambiguous social information as threat. HT/TA individuals who are capable of solving problems without increasing stress would exhibit adequate responding without requiring additional resources dedicated to worry. In contrast, GAD worriers ratings on social phobia and

social avoidance factors and social evaluative concerns are significantly higher. Several conclusions can be derived from this interpretation.

First, the higher rating of Constructive Thinking among HT/TA individuals may be indicative of lower levels of manifest vulnerability to GAD. Second, the relatively focused worry across fewer GAD related life-domains may indicate higher levels of social and cognitive performance in community college students. Third, this study provides preliminary and qualified evidence for suggesting that for some high trait anxious individuals, the academic environment may be related to the moderation of a manifest vulnerability to GAD.

This interpretation is necessarily limited; no data regarding participant cognitive or social functioning were collected and analyzed (e.g., GPA, attendance, comprehension ability). As a result, a relationship between levels of GAD worry and established academic criterion for adequate cognitive or social responding can not be directly assessed. However, Gad-like worry has been shown to be highly correlated and causally implicated in increased distraction, forgetfulness, irritability, and emotional discomfort (for discussion see Williams, Watts, MacLeod, & Mathews, 1988). Thus the assumption that a relationship between observed differences in test anxious students' qualitative and quantitative GAD worry elements and adequate cognitive and

social performance is justified though not directly supported by empirical evidence gathered in this study. Further research is needed to explore a possible correspondence between levels of cognitive and social functioning in stressed HT/TA individuals, worry, learning, and performance.

A relationship may exist between the structured academic environment and the mitigation of worry, and between adequate scholastic functioning and coping with stress as measured by the CTI. Interpretation of the findings concerning relationships of this nature are necessarily qualified by a lack of direct evidence. No attempt to directly assess the impact of the academic environment upon coping with stress and subsequent moderation of GAD worry was made. However, this study's results remain relevant to this issue.

The results of this study support an observation that relationships between the structure inherent in academia and a moderating factor in the manifest vulnerability to GAD are possible to explore. It can be concluded that self-report instruments measuring changes in scholastic aptitude along with academic social and cognitive involvement may correlate with changes in qualitative and quantitative aspects of worry. The development of these instruments would further research in the area of test anxiety and worry. Differences between the HT/TA and GAD worried student groups on the CTI

do suggest that, on average, problem solving without increasing stress is a factor related to worry in these populations. Thus, factors increasing Constructive Thinking as cognitive problem solving are implicated in the mitigation of GAD worry. From this standpoint it is reasonable to argue that the scholastic environment may provide an unambiguous structure for learning problem solving without increased levels of stress, relative to the larger social world. This suggests that future research is required concerning the scholastic environment and that environment's contribution to increased coping and possible decreased manifest vulnerability to GAD worry.

In conclusion, this study was successful in its attempt to reveal underlying dimensions of worry and the relationship between those dimensions and cognitive coping with stress. Future research may find it useful to develop models that investigate Epstein's Constructive Thinking as a moderator of GAD worry. Furthermore, the findings suggest that theory and research focused on GAD and Social Phobia are related to research exploring test anxious / trait anxious community college students ability to adequately cope with stress. Lastly, there are elements related to social evaluation and the inference of threat concerning evaluation common to GAD, Social Phobia, and Test Anxiety. This provides preliminary evidence for Eysenck's (1992) statement that social interaction may represent increased

worry and stress, resulting in the increased likelihood of vulnerability to GAD. The support gathered for these hypotheses is qualified and provisional. However, it appears that this study does provide initial direction for further exploration of factors that may have a potential to mitigate both test anxiety and GAD.

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