

CIRCUMSCRIBED VERSUS GENERALIZED SUBTYPES
OF SOCIAL PHOBIA: A COGNITIVE
PSYCHOPHYSIOLOGICAL
INVESTIGATION

BY

MICHAEL R. LEWIN

Bachelor of Arts
State University of New York At Albany
Albany, New York
1983

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1987

Submitted to the faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
July, 1992

Thesis
1992D
L672C

CIRCUMSCRIBED VERSUS GENERALIZED SUBTYPES
OF SOCIAL PHOBIA: A COGNITIVE
PSYCHOPHYSIOLOGICAL
INVESTIGATION

Thesis Approved:

Daniel W. White

Thesis Advisor

William H. Rambo

Kenneth D. Sandvold

Gene D. Hugley

Dean of the Graduate College

ACKNOWLEDGMENTS

I would like to express my gratitude to the many people, who in their own way have helped to encourage and inspire me to complete my graduate studies and be the person I am today. I would like to express appreciation to committee members Kenneth Sandvold, William Rambo, and Jim Hughey, as their input and flexibility has been extremely helpful toward completing my dissertation. A special appreciation is owed to Dan McNeil for his input, patience, and support as my dissertation advisor, research advisor, clinical supervisor, and friend.

I would also like to express my sincere gratitude to my friends, whose laughter and support have helped me to continue ahead in difficult times: Marty Boone, Dave and Laura Brunetti, Benn and Leslie Carter, Bill Lewis, Khanh Nyguen, Scot Robinson, Jordan Schoenhaut, and my special friend, Norb Seufert, whom I consider my brother. Additionally, I would like to express appreciation to my new friends at OSU for their support and friendship down the stretch: Matt Doppler, Tim Durazzo, Isaac Martinez, Barry Ries, Cindy Turk, and Debbie Uretsky.

Finally, words could not express the deep felt gratitude I feel towards my family for their continuous love

and encouragement: my "little" sister and friend, Lori Constance Lewin who I am fortunate and proud to have in my life, my mother, Helen Estremera for her support and her special love for her son, my "padrino", Arthur Lewin for his continuous love and encouragement, and my father, Charles Riess Lewin for being a special dad whose love and support for his family was his first priority..... It is in his loving memory that I dedicate this dissertation.

TABLE OF CONTENTS

	Page
ABSTRACT.....	1
Social Phobia.....	2
Comorbidity of Social Phobia and Personality Disorder.....	5
A Continuum of Social Anxiety.....	6
Prevalence of Social Phobia and Social Anxiety.....	9
Conceptual Models of Social Phobia.....	11
Classical Conditioning Model.....	11
Response Deficit Model.....	12
Cognitive Construct Model.....	12
Psychobiological Theory.....	13
Bioinformational Model of Emotion.....	13
Assessment of Cognitive Processing.....	15
Imagery and Psychophysiological Assessment: Simple Versus Social Phobia.....	15
Physiological Reactivity.....	18
Verbal Reports of Imagery.....	19
Cognitive Interference: The Stroop Color-Naming Test.....	20
Use of Nonclinical Subjects.....	24
Statement of the Problem.....	26
METHOD.....	28
Subjects.....	28
Materials.....	30
Screening Assessment Battery.....	30
Laboratory Assessment Battery.....	30
Apparatus and Laboratory Setting.....	33
Procedure.....	35
Screening Session.....	35
Laboratory Session.....	36
Imagery Assessment Phase.....	36
Audiotaped Scripts.....	37
Order of Script Presentation.....	39
Imagery Trials.....	39
Stroop Color-Naming Assessment Phase.....	40

	Page
Stroop Test Forms.....	42
Stroop Trials.....	43
Order of Stroop Form Presentation.....	44
RESULTS.....	45
Data Reduction and Preliminary Analyses.....	45
Initial Assessment Verbal Report Instruments.....	47
Speech Anxiety, Social Anxiety and Modified Stroop Tests.....	48
Imagery Assessment.....	49
Cardiac Responsivity to Imagery Content.....	49
Valence Ratings.....	49
Arousal Ratings.....	50
Dominance Ratings.....	51
Vividness Ratings.....	52
DISCUSSION.....	52
Distinctions Between Circumscribed Speech and Generalized Social Anxiety.....	52
Replication of Findings From The Bioinformational Theory.....	54
Equivocal Results and Implications For Future Research.....	56
REFERENCES.....	60
APPENDIXES.....	82
APPENDIX A - RELAXATION SCRIPT.....	82
APPENDIX B - IMAGERY SCRIPTS.....	83

LIST OF TABLES

Table	Page
1. Mean Scores for Initial Assessment Verbal Report Instruments.....	72
2. Mean Scores for Stroop Tests.....	75

LIST OF FIGURES

Figure	Page
1. SAM Valence Ratings Across All Content Areas.....	78
2. SAM Arousal Ratings Across All Content Areas.....	79
3. SAM Dominance Ratings Across All Content Areas.....	80
4. Vividness Ratings Across All Content Areas.....	81

Abstract

This study examined differences in cognitive processing of public speaking anxious and generally socially anxious individuals via imagery and Stroop color-naming assessments. From a pool of psychology students, 48 subjects were chosen for inclusion into one of three gender-balanced groups: (a) high in both public speaking and general social anxieties (generalized group), (b) high in public speaking anxiety and low in general social anxiety (circumscribed group), or (c) low in both types of anxiety (control group). Cardiac and verbal data were collected as subjects imagined a variety of scenes (e.g., speech and conversation). Additionally, subjects color-named anxiety as well as control words in Stroop tasks. Subjects high in both social and public speaking anxieties manifested greater reports of negative evaluation fears, more generalized social anxieties, and more arousal in social scenes than their circumscribed speech anxious counterparts. Additionally, both anxiety groups demonstrated more reports of social anxiety, and lesser reports of dominance and positive valence in speech scenes, as compared with controls. Findings are discussed in relation to Lang's bioinformational theory of emotion.

Circumscribed Versus Generalized Subtypes of Social
Phobia: A Cognitive Psychophysiological Investigation
Social Phobia

Social phobia is a disorder characterized in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition-Revised (DSM-III-R; American Psychiatric Association, 1987) by (a) persistent fear of one or more social situations in which scrutiny by others is possible, (b) immediacy of anxiety when exposed to phobic situation(s), (c) avoidance of phobic situation(s) or endurance with intense anxiety, (d) interference with social/occupational functioning or experience of pronounced distress about anxiety, and (e) recognition of anxiety as unreasonable or excessive by the person. Moreover, social phobia is presented in several forms in the DSM-III-R. These types range from more circumscribed social phobias (e.g., public speaking, eating in public places, urinating in public restrooms, writing in public) to a "generalized type" of social phobia that reflects anxiety across a variety of social situations (i.e., in most or all social situations). Most circumscribed forms of social phobia, with the exception of public speaking phobia, are believed to be relatively uncommon (Pollard &

Henderson, 1988; Turner & Beidel, 1989). Public speaking phobia (a circumscribed type) and the generalized type of social phobia are considered to be the most common (Barlow, 1988; Pollard & Henderson, 1988; Turner & Beidel, 1989).

Researchers have delineated types of social anxieties and phobias (Fremouw, Gross, Monroe, & Rapp, 1982; Heimberg, Hope, Dodge, & Becker, 1990; McNeil & Lewin, 1986, 1992; Pollard & Henderson, 1988; Turner & Beidel, 1985). Public speaking anxiety and phobia have been demonstrated to exist independently of more general social anxieties/phobias (Heimberg et al., 1990; McNeil & Lewin, 1986, 1992). Moreover, McNeil and Lewin (1986, 1992) found that general social anxiety is a more pervasive condition than public speaking anxiety. Specifically, generally socially anxious individuals manifested a greater degree of general fearfulness and negative evaluation fears than public speaking anxious individuals. Heimberg et al. (1987, 1990), using a clinical population of social phobics, concluded that generalized social phobics reported more anxiety, more depression, and manifested greater anxiety and poorer social skill during an individualized behavioral avoidance test (BAT) compared

to circumscribed speech phobics. The McNeil and Lewin (1986, 1992) and Heimberg et al. (1987, 1990) studies utilized nonclinical and clinical subjects, respectively. Results from both studies suggest that public speaking anxiety/phobia is a more circumscribed, less pervasive condition than more generalized social anxiety/phobia. Given these findings, current diagnostic criteria for social phobia are seen as problematic in that individuals with discrete and generalized forms of the disorder receive the same diagnosis. These two subgroups of individuals, however, present with different symptomatology.

In a recent review of the literature on subtypes of social phobia, Heimberg and Holt (1991) conclude that social phobia subtypes are heterogeneous, with varying levels of psychopathology, differential clinical presentations, and perhaps differential treatment response. These researchers call for more research in the area of subtypes of social phobia so that there can be a more coherent set of diagnostic criteria in future revisions of the DSM.

Comorbidity of Social Phobia and Avoidant Personality Disorder

Social phobia has been demonstrated to be a distinct clinical entity relative to agoraphobia and panic disorder (Brooks et al., 1989; Rapee, Sanderson, & Barlow, 1988; Turner & Beidel, 1989) and generalized anxiety disorder (Reich, Noyes, & Yates, 1988). Features of social phobia, however, are prevalent across other anxiety disorders (Rapee et al., 1988; Turner & Beidel, 1989).

Social phobia is highly associated with avoidant personality disorder (Barlow, 1988; Herbert, Hope, & Bellack, 1992; Holt, Heimberg, & Hope, 1992; Turner, Beidel, & Townsley, 1992; Widiger, 1992). Currently, the distinction between the generalized type of social phobia and avoidant personality disorder is confused by the overlap in diagnostic criteria (i.e., three of the seven criteria for avoidant personality disorder are identical to social phobia criteria). Recently, four articles on the topic were published in the Journal of Abnormal Psychology (Herbert et al., 1992; Holt et al., 1992; Turner et al., 1992; Widiger, 1992). In general, the findings were consistent across the three studies. Specifically, many instances of generalized social

phobia (GSP) existed without concomitant avoidant personality disorder (APD); the converse, however, was very uncommon. Moreover, these studies suggest that differences between GSP and APD were more quantitative than qualitative. Specifically, more concomitant depression, social anxiety, and general anxiety was found in APD than in GSP. Interestingly, no differences between groups were found in their behavior during role-plays. Previous research had suggested that differences between GSP and APD were in the area of social skill (Turner et al., 1986). Widiger (1992) calls for more research in the area toward a refinement of diagnostic criteria for social phobia and APD.

A Continuum of Social Anxiety

Social anxiety has been conceptualized as existing on a continuum ranging from little or no anxiety to "typical" social anxieties to more problematic social anxiety to the condition of social phobia. Marks (1987) has forwarded definitions of fear, anxiety, and phobia. Fear is believed to be a normal unpleasant affectual response to realistic threats in the environment. Anxiety is viewed as an emotion similar to fear, but arising without an objective threat from the environment. Phobia is viewed as an intense fear

which is out of proportion to the objective danger of the feared stimulus. This level of fear cannot be either explained or reasoned away; such fear will lead to the avoidance of the feared stimulus (Marks, 1987). McNeil, Vrana, Cuthbert, Melamed, and Lang (1992), however, have conceptualized fear and anxiety somewhat differently. Specifically, McNeil et al. (1992) view fear as a visceral mobilization for physical avoidance or escape in response to stimulus cues. Anxiety, on the other hand, is defined as state which creates only modest, less focused visceral demands than fear (e.g., less physical avoidance and escape); anxiety takes forms such as worry, restlessness, passive avoidance and negative self-talk. These researchers have found that severity level of phobia and imagery ability of phobics differentially influenced "anxious" and "fearful" groups. Specifically, "fearful" phobics demonstrated more visceral responsivity to phobic memories than "anxious" phobics.

Presently, the DSM-III-R criteria for social phobia do not require actual avoidance of social stimuli for the classification of social phobia (American Psychiatric Association, 1987). Under the current DSM system, intense anxiety in response to

social stimuli can substitute for avoidance in the diagnosis of social phobia.

In the current study, social anxieties are viewed as existing on the previously mentioned continuum, with the premise that social anxiety research has important implications for social phobia research, and vice versa. Based upon this premise, intense forms of social anxiety are viewed to be similar to social phobia, with differences perhaps being in degree of distress and presentation for psychotherapeutic assistance. Highly anxious but nonclinical populations (e.g., highly anxious undergraduates) are viewed as appropriate populations for study of social anxiety, which has relevance for the understanding of social phobia.

In the social phobia literature, a multitude of terms have been used to describe social discomfort (e.g., social anxiety, stage fright, social fear, social phobia, and shyness). The current review of the literature will examine research on both social anxiety (including studies utilizing nonclinical populations) and social phobia (including studies utilizing DSM diagnosed individuals).

Prevalence of Social Phobia and Social Anxiety

Research based upon nonclinical, intensely socially anxious individuals estimates that the prevalence of social anxiety in the general population is approximately between 20-41% (Beidel et al., 1985). Prevalence data on social phobia estimate that approximately 2% of the general population are affected by the disorder (Barlow, 1988; Pollard & Henderson, 1988; Robins, Helzner, Weissman, Orvaschel, Gruenberg, Burke, & Reiger, 1984). Pollard and Henderson (1988) report social phobia prevalence rates of 22.6% in the general population, before applying the DSM-III-R significant distress criterion, a criterion which the authors believe is excessively conservative. Additionally, in clinical investigations of persons requesting therapeutic assistance at anxiety disorder clinics, 8% to 15% of these clients had a principal diagnosis of social phobia (Barlow, 1988; Marks, 1970; Sanderson, Rapee, & Barlow, 1987). The differences in prevalence rates between severe social anxiety and social phobia has been hypothesized to be due to the inclusion of behavioral impairment and/or significant distress criteria in the categorization of social phobia as a mental disorder (Turner & Beidel, 1989).

Researchers suggest that prevalence rates for social phobia may in fact be higher due to the avoidant nature of the disorder. This notion is consistent with viewing social anxieties on a continuum, with differences between social anxiety and social phobia as one of degree of distress. Some individuals with social anxieties will have social phobia, while others will not have problems that severe.

These prevalence figures have profound clinical implications when one considers the psychological concomitants of social phobia or intense social anxiety. Inadequate or stressful social relationships are widely regarded as either the primary or a major component in many forms of psychopathology (Richardson & Tasto, 1976). Research has implicated both social anxiety and social phobia as concomitants with behavioral impairment or avoidance in social situations (Beidel et al., 1985; Zimbardo, 1977), feelings of frustration and loneliness (Marlodo, 1981), inability to date or become involved in romantic relationships (Schlenker & Leary, 1982; Twentyman, 1985), alcohol abuse (Leibowitz, Gorman, Fyer, & Klein, 1985; Pilkonis, Feldman, & Himmelhoch, 1981; Schneier,

Martin, Liebowitz, Gorman, & Fyer, 1989) and depression (Brooks, Baltazar, & Munjack, 1989).

Ironically, social phobia was not officially recognized as a mental disorder until the publication of the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III; American Psychiatric Association, 1980). Social phobia has been referred to as the "neglected anxiety disorder" (Leibowitz et al., 1985). Recently, however, a special issue of Clinical Psychology Review (1990) has been devoted to social phobia.

Conceptual Models of Social Phobia

Researchers in the field of social phobia typically conceptualize the etiology and maintenance of social phobia in accordance with behavioral models (Glass et al., 1982; Richardson & Tasto, 1976; Trower & Gilbert, 1989; Turner & Beidel, 1989) that are described here.

Classical conditioning model. This model asserts that social phobia represents relatively automatic conditioned anxious responses to social stimuli. Additionally, the classical conditioning model of social phobia advocates the use of systematic desensitization as a primary intervention (Curran &

Gilbert, 1975). The efficacy of systematic desensitization, however, is diminished with clients who exhibit more generalized social anxieties (Meichenbaum, Gilmore, & Fedoravicious, 1971) and with clients who possess limited social behavioral repertoires (Glass et al., 1982).

Response deficit model. This model conceptualizes social phobia as negative affective residuals of ineffective behavioral repertoires in coping in social situations. This response deficit model advocates the use of social skills training and response acquisition programs as primary interventions (Twentyman & McFall, 1975).

Cognitive construct model. This model conceptualizes social phobia as a negative arousal state in response to self-induced, self-maintained, inappropriate or inaccurate cognitive constructs and panic-related imagery (Beck, 1976; Ellis, 1977; Heimberg & Barlow, 1988; Meichenbaum et al., 1971). Moreover, these inappropriate cognitions lead to distraction from the social task and increases in anxiety and possibly less appropriate social behavior. The use of cognitive desensitization and restructuring interventions is advocated in order to disengage the

cognitive induction of anxiety in response to social situations.

Psychobiological theory. This specific theory postulates that social phobias developed to deal with perceived social threats. Psychobiological theory focuses on species-specific evolutionary survival mechanisms (Ohman, 1985; Trower & Gilbert, 1989). It is assumed that behavior is organized via power relationships which emphasize both dominant and submissive roles (Trower & Gilbert, 1989). Social phobic people strive for dominance; they have low efficacy expectations related to the development and maintenance of dominance, however, and become anxious when attempting dominance behavioral repertoires. In order to preserve their current status, socially phobic people settle for appeasement behaviors or more primitive strategies of avoidance/escape. Therapeutic approaches advocated by this model include cognitive behavioral approaches to alter appeasement coping strategies (e.g., changing self-deprecation to self-acceptance).

Bioinformational model of emotion. The bioinformational model of emotion adopts an information processing perspective in the conceptualization of the

memory organization of fearful information (Lang, 1977, 1985). Emotional information is hypothesized as being coded in memory in the form of propositions arranged in associative networks. These propositions form "if-then" associations in memory in which an appropriate trigger event may lead to the evocation of a fear/anxiety response. The fear/anxiety representation in memory is viewed as an action prototype composed of information in three domains: (a) propositions that delineate the fear/anxiety-relevant stimuli, (b) propositions that represent the overt behavioral, physiological, and verbal response mechanisms, and (c) propositions that identify the contextual meaning of the stimulus and response components. It is hypothesized that when a threshold of fear/anxiety-relevant sensory inputs match the fear/anxiety-relevant propositions in memory, the fear/anxiety memory network is activated, possibly leading to overt fear/anxiety expressions (e.g., behavioral avoidance), and/or an increase in physiological responsivity, and/or negative verbalizations. Given that imagery has proved to be an effective method in accessing fear/anxiety networks, including response components, the present study

examined social phobia subtypes from a bioinformational perspective using imagery.

Assessment of Cognitive Processing

Recently, researchers have adopted traditional methodologies of cognitive psychology in an attempt to understand the cognitive processes underlying psychopathology. In the present study, two such methodologies will be employed:

1. Imagery assessment, based upon Lang's bioinformational model of emotion (e.g., Lang, 1985) is one such procedure which assesses the manner in which individuals may interpret, process and respond to environmental stimuli according to propositional network theory.

2. The Stroop color-naming test is a procedure which assesses the degree of interference in cognitive processing when an individual is confronted with conflictual stimuli in a color-naming task.

Imagery and psychophysiological assessment:

Simple versus social phobia

The research of Lang and his associates has assessed the hypothesis that nosological variance in fear/anxiety imagery among the anxiety disorders exists, and is due to differences in the organization

of emotional memory among these disorders (Cook, Melamed, Cuthbert, McNeil, & Lang, 1988; Lang, 1985; McNeil et al., 1992). Specifically, it is hypothesized that anxiety disorders can be considered as existing along a continuum, based upon the interrelatedness of various propositions comprising an underlying memory structure (Lang, 1985). Within this conceptualization, the simple phobias are viewed as possessing the most highly organized and coherent propositional networks, permitting the most consistent lucid evocation of fear/anxiety imagery and responsivity via circumscribed trigger stimuli. Social phobia is viewed as being further down the continuum, possessing less organized fear/anxiety related propositional networks in memory organization. Social phobia, however, is seen as having a more coherent and organized propositional fear/anxiety memory network than generalized anxiety disorder and agoraphobia. Therefore, in studies examining differences between social phobia and simple phobia, it is presumed that social phobics will manifest less psychophysiological responsivity in response to fear/anxiety relevant imagery prompts than simple phobics, but more than persons with generalized anxiety disorder or agoraphobia.

Research comparing public speaking phobics with small animal phobics has provided support for the idea that social phobics have a less coherent memory structure and therefore less activating imagery than simple phobics (Lang, Levin, Miller, & Kozak, 1983; Lang, Melamed, & Hart, 1970; McNeil et al., 1992; McNeil, Vrana, Melamed, & Lang, 1985; Weerts & Lang, 1978). Group differences have been observed in the realm of verbal report of imagery vividness and in physiological reactivity (e.g., heart rate and skin conductance) to imagery scenes. Results in these experiments, although encouraging, have been mixed, both within and between studies. Conclusions from this work are that there is a general trend toward more physiological and verbal responsivity to fear/anxiety stimuli in simple phobics versus social phobics. These differences, however, have not always reached statistical significance. One possible explanation for the equivocal findings in this area is the utilization of speech phobics anxious/phobic individuals as subjects. As already noted, some of these individuals have circumscribed problems, primarily or only pertaining to speeches; others have more generalized social anxieties in addition to public speaking

anxiety. The heterogeneity in this subject population may cause difficulties in elucidating differences between social anxiety/phobia and other anxieties and anxiety disorder. Individuals with circumscribed speech phobia may respond more like simple phobics and obscure differences that may exist between social phobia and other anxiety disorders.

Physiological reactivity. Variance in imagery between simple phobics and social phobics has been observed via psychophysiological indices (e.g., Lang et al., 1970). In Lang et al. (1970), spider phobics' (simple phobic group) physiological responses (heart rate, skin conductance, and respiration rate) were consistently positively correlated with hierarchical rankings of anxiety associated with imagery scripts. Speech phobics, however, exhibited a significant positive correlation only for heart rate data. Additionally, spider phobics exhibited habituation in their electrodermal activity over trials. The speech phobics, however, did not manifest such habituation (Lang et al., 1970). These data suggest that spider phobics display more focused psychophysiological responses than speech phobics. Lang et al. (1983) reported that snake phobics responded with greater

physiological response to snake fear imagery scripts than speech phobics. Speech phobics, however, did not respond more physiologically to speech fear imagery scripts than spider phobics. For the speech imagery scripts, spider phobics and speech phobics responded similarly. Across all fear/anxiety and other arousing imagery scripts, except speech scripts, the spider phobics manifested physiological responses that were greater than the speech phobics. Along these lines, McNeil et al. (1992) found that for specific phobics (i.e., dental phobics), cardiac responsivity was positively correlated with report of imagery vividness and concordant with verbal report of affective distress; these results were not found for speech phobics. Additionally, speech phobics failed to demonstrate a stronger cardiac response to speech scenes than their dental fear counterparts.

Verbal reports of imagery. Differences between social phobics and simple phobics have been identified in the realm of verbal report as well. Lang et al. (1970) found that simple phobics reported greater imagery vividness to both neutral and fear/anxiety scripts. Additionally, the simple phobics displayed a significant linear relationship between self-report of

anxiety and ranking on an anxiety script hierarchy. This linear relationship between anxiety hierarchy ranking and self-report of anxiety was not observed in speech phobics. Weerts and Lang (1978) found that simple phobics reported more imagery vividness for both fear/anxiety and standard scenes than speech phobics. Additionally, simple phobics rated the fear/anxiety scripts as more arousing. This finding was not observed in the speech phobia group. Finally, Lang et al. (1983) found that simple phobics' imagery and arousal ratings to their fear/anxiety-relevant imagery scripts were significantly greater than speech phobics. Conversely, both groups reported similar ratings to speech fear/anxiety scripts.

The aforementioned studies suggest that social phobics' imagery responses are less coherent and robust than those of simple phobics. These findings are consistent with the notion that the memory organization of fear/anxiety-relevant information is considerably more diffuse and less coherent in social phobics than simple phobics.

Cognitive Interference: The Stroop Color-Naming Test

Recently, researchers have utilized the Stroop color-naming task (Stroop, 1938) in the assessment of

anxiety disorders (Hope et al., 1990; Lunsford et al., 1991; Mathews & MacLeod, 1985; Watts, McKenna, Sharrock, & Trezise, 1986). Stroop (1938) required subjects to name the ink color of words which were either control patches (e.g., a series of squares) or names of colors (e.g., blue). Results indicated that subjects' response time for color name words was much greater than their response time for control patches. An early explanation of this phenomenon was that color naming of color words requires more cognitive processing than control patches due to a semantic interference effect (Dyer, 1973). Several other explanatory models of the Stroop effect have been proposed:

1. Input models, in which incoming stimuli, both relevant (i.e., colors of words) and irrelevant (i.e., semantics) are viewed as in competition for limited perceptual processing capacities (Treisman, 1969).

2. In output models, a blocking of weaker, less practiced responses (i.e., verbal response to color names) occurs in the presence of a simultaneous, stronger, more practiced (i.e., verbal response to word meaning) responses (Stroop, 1938).

3. In Decision making process models, the Stroop effect is seen as a delay in the decision to respond to color or semantics of Stroop stimuli (Pardo, Pardo, Janer, & Raichle, 1990).

4. Parallel processing models, in which words and colors are conceptualized as being processed in parallel initially along separate pathways. These separate pathways, however, are seen as terminating in a common response pathway, creating competition for response. Word stimuli are processed more automatically due to a hypothesized stronger pathway connection and therefore are the primary response tendency as opposed to color-naming (Cohen, Dunbar, & McClelland, 1990).

In a recent review of the literature, MacLeod (1991) examined theoretical models of the Stroop effect. It was concluded that models attempting to locate blocking in attention were less powerful than parallel processing models in accounting for the Stroop effect.

Researchers have examined reaction times in a modified Stroop task requiring the color-naming of fear/anxiety words versus neutral words (Hope et al., 1990; Lunsford et al., 1991; Mathews & MacLeod, 1985;

Watts et al., 1986). These studies have identified a similar interference effect in the color-naming of fear/anxiety words versus neutral ones, as in the interference between color words and neutral words.

Mathews and MacLeod (1985) demonstrated that patients diagnosed with generalized anxiety disorder manifested significantly greater response times on a color-naming task of threatening (anxiety-related) words than control subjects. Moreover, these patients' response times were significantly slower for threat words than neutral words. Control subjects, however, did not respond differentially between neutral words and threat words. Watts et al. (1986) reported similar findings with spider phobics who either received treatment (systematic desensitization) or no treatment. Results indicated that both groups demonstrated posttest improvement in color-naming of fear/anxiety relevant words. The treatment group, however, exhibited greater improvement than their no-treatment counterparts. Moreover, this finding was not found for neutral control words. These data are promising in that they point to the utility of the Stroop test in clinical assessment and in the evaluation of treatment outcome of phobic individuals. More recently,

researchers have demonstrated response latencies for social phobia affective or situational words with social phobic populations (Hope et al., 1990; Lunsford et al., 1991).

Use of Nonclinical Subjects

A large amount of research on social anxiety and phobia has been conducted utilizing highly anxious college student populations (Beidel, Turner, & Dancu, 1985; Glass, Merluzzi, Biever, & Larsen, 1982; Leary, 1983; McNeil & Lewin, 1986; Turner & Beidel, 1985). Research utilizing highly socially anxious student populations rests on the assumption that highly socially anxious students represent an appropriate analog of social phobia. All fears/anxieties are viewed as existing on a continuum of fear/anxiety ranging from mild fear/anxiety to extreme fear/anxiety or phobias. Research assessing the appropriateness of this assumption has demonstrated that highly socially anxious college students manifest responses similar to social phobics on a variety of behavioral, physiological and cognitive indices (Nyman & Heimberg, 1985; Turner, Beidel, & Larkin, 1986). Nyman and Heimberg (1985) found that nonclinical socially anxious students differed only slightly from clinical social

phobics in the amount of negative self-statements, behavioral skill, and affective measures of fear/anxiety. The authors concluded that the difference between fear/anxiety reported by socially anxious but nonclinical populations, and social phobia clinical patients, was one of extent and to the degree to which the fear/anxiety was perceived to be disruptive of daily functioning. Researchers (e.g., Borkovec & Rachman, 1979; Kazdin, 1978) have typically acknowledged the continuity between clinical patients and nonclinical populations, noting that variance within and between these groups is typically related only to the intensity of fear/anxiety. Along these lines, Lewin and McNeil (1987) reported that nonclinical highly anxious college students and clinical patients seeking psychotherapeutic assistance for social phobia manifested similar amounts of behavioral avoidance, verbal dysfluencies and negative self-statements in response to an in vitro speech task.

Recently, McNeil et al. (1992) reported that more similarities than differences exist between clinical and nonclinical individuals with social anxieties. These authors found few differences on questionnaires assessing general psychopathology, affective judgments

to fear/anxiety imagery, and physiological activation (with the exception of skin conductance).

Statement of the Problem

To insure an appropriate fearful/anxious sample, this study selected fearful/anxious individuals whose fear/anxiety responses represent the upper 10% of their same-gender distribution. Gender differences in the realm of verbal report of fear/anxiety have been documented elsewhere (Barlow, 1988). Specifically, females generally tend to report more fear/anxiety than males. In response to these gender differences, subjects chosen for inclusion were selected based upon their level of fear/anxiety for their same-gender distributions. Additionally, given the notion of social anxiety and social phobia existing along a continuum of fear/anxiety, the previously mentioned selection criteria were utilized.

The present study was designed to assess the response differences, from a cognitive processing perspective, between public speaking anxious individuals and individuals reporting generalized social anxiety. Previous research has suggested that public speaking anxiety can exist independently of generalized social anxiety as a more circumscribed type

of social anxiety (Heimberg, Hope, Dodge, & Becker, 1987, 1990; McNeil & Lewin, 1986, 1992). Moreover, it has been suggested that generalized social anxiety is more pervasive (e.g., more concomitant fears and depression, more fears of negative evaluation) than public speaking anxiety (McNeil & Lewin, 1986, 1992; Spitzer & Williams, 1985). In light of these findings, as well as the data on imagery differences between simple and social phobics, and the current DSM-III-R classification of subtypes of social phobia, the present study investigated the notion of public speaking phobia as a discrete subtype of social phobia, resembling a more circumscribed type of fear/anxiety, like a simple phobia. These alternative conceptualizations (circumscribed versus generalized subtypes) have meaningful implications for the clinical assessment and selection of treatment interventions with socially phobic individuals.

The main experimental questions of the current study concerned hypothesized differences in the cognitive processing of fear/anxiety stimuli between public speaking anxious and generally socially anxious individuals. Specifically, it was predicted that public speaking anxious individuals (circumscribed

group) would manifest greater cardiac responsivity to relevant fear/anxiety imagery scenes than generally socially anxious individuals (generalized group). Verbal reports of affective judgments were also expected to be stronger in the public speaking anxious individuals. Each fear/anxiety group was expected to exhibit greater cardiac responsivity to relevant fear/anxiety scenes than to nonfear/anxiety scenes. Public speaking anxious individuals were expected to manifest greater response latencies in their fear/anxiety-relevant Stroop tasks than their generally socially anxious counterparts. Additionally, in the realm of verbal report, generally socially anxious individuals were expected to manifest more general fearfulness, greater report of negative evaluation fears, more general trait anxiety, and more self-reports of depression than public speaking anxious individuals and nonanxious control subjects.

Method

Subjects

Subjects were 48 introductory psychology students at Oklahoma State University. All participants were compensated via extra class credit. Subjects were chosen for inclusion from a pool of introductory

psychology students based on their responses on a public speaking anxiety questionnaire and a general social anxiety inventory. Only those individuals scoring in the top 10% of their same-gender distribution in terms of either public speaking anxiety or general social anxiety (or both) were eligible for participation as "high anxiety" subjects. "Low anxiety" subjects were required to have scored in the bottom 50% of these same distributions. Low anxiety subjects were equally selected across the bottom 50% of these distributions in order to have a representative sampling of typical nonphobic individuals (McNeil et al., 1992). Appropriate subjects were selected for inclusion in one of three gender-balanced groups ($n = 16$ per group): (a) high in both public speaking and general social anxieties (generalized group), (b) high in public speaking anxiety and low in general social anxiety (circumscribed group), (c) low in both public speaking and general social anxieties (control group). Individuals who reported a positive history for cardiovascular abnormalities, substance abuse, or color blindness were excluded from participation. Additionally, subjects that could not correctly

identify and differentiate colors on practice Stroop stimuli were excluded from participation.

Materials

Screening assessment battery. In the screening phase of the study, groups were determined based on verbal report responses to:

1. Personal Report of Confidence as a Speaker (PRCS; Paul, 1966). The PRCS is a 30 item true-false questionnaire designed to assess fear/anxiety experienced in public speaking situations. The range of possible scores on the PRCS is 0-30; higher scores are indicative of more fear/anxiety.

2. Social Avoidance and Distress Scale (SADS; Watson & Friend, 1969). The SADS is a 28 item true-false questionnaire designed to assess the degree of fear/anxiety associated with a variety of social situations. The range of possible scores on the SADS is 0-28; higher scores are indicative of more fear/anxiety.

Laboratory assessment battery. This phase of the study consisted of verbal report instruments assessing a variety of fears and anxieties as well as depression and individual imagery ability. This battery consisted of the following questionnaires:

1. Questionnaire upon Mental Imagery (QMI; Sheehan, 1967; shortened version of Bett's 1909 Questionnaire upon Mental Imagery; reprinted in Richardson, 1969), which is a 35 item, 7-point (1-7) Likert-type scale assessing imagery ability across the five sensory modalities. The QMI has a range of 35-245; lower scores are indicative of greater imagery ability.

2. Fear Survey Schedule-III (FSS-III; Wolpe & Lang, 1964, 1969). The FSS-III is a 108 item, 5-point (0-4) Likert-type scale assessing the degree of general fearfulness to a variety of objects and situations. The FSS-III has a range of 0-432; higher scores are indicative of greater general fearfulness.

3. Fear of Negative Evaluation Questionnaire (FNE; Watson & Friend, 1969). The FNE is a 30 item true-false inventory designed to assess fear/anxiety in response to social-evaluative situations. The FNE has a range of 0-30; higher scores are indicative of more evaluation fear/anxiety.

4. State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, Vagg, & Jacobs, 1983). The STAI consists of two 20 item, 4-point (1-4) Likert-type scales designed to assess current anxiety level

(state) as well as customary anxiety level (trait). The range of scores on the STAI forms are 20-80; higher scores are indicative of more anxiety.

5. Beck Depression Inventory (BDI; Beck, Eard, Mendelson, Mock, & Erbaugh, 1961). The BDI is a 21 item, 4-point (0-3) Likert-type scale designed to assess the presence and severity of the affective, motivational, cognitive, and psychomotor aspects of depression. The BDI has a range of 0-63; higher scores are indicative of more depression. This measure was included to assess concomitant depressive symptoms often found with social anxiety/phobia (Brooks et al., 1989).

6. The Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu, & Stanley, 1988). The SPAI consists of a social phobia subscale and an agoraphobia subscale. The social phobia subscale consists of a 32 item, 7-point (1-7) Likert-type scale designed to assess the cognitive, somatic and behavioral aspects of social anxiety. Additionally, the SPAI has an agoraphobia subscale which consists of 13 additional, 7-point (1-7) Likert-type items to assess the degree of agoraphobic symptomatology. The total score for social anxiety on the SPAI is derived via a difference score

between the social phobia subscale and the agoraphobia subscale (i.e., social phobia subscale score minus the agoraphobia subscale score). The agoraphobia subscale correction procedure was utilized to control for social anxiety symptoms which may be reflecting a larger clinical syndrome of agoraphobia (Turner et al., 1988). The SPAI derived total score has a range of -78 to 192; higher scores are indicative of more social anxiety.

Apparatus and Laboratory Setting

The research laboratory consisted of three adjacent rooms designed for data collection. One room was specifically used for questionnaire completion. Another room was specifically designed for imagery data collection. In this room was a Lane oversized reclining chair, in which subjects sat during the imagery procedure. Sound-deadening foam padding had been placed upon the walls, window, and door of this room to reduce outside noise. A centrally-located control room housed a microcomputer and an audio feedback system for automated presentation of experimental stimuli. Additionally, the audio feedback system allowed for two-way communication between the centrally located computer room and both the questionnaire and imagery rooms.

An IBM PC/XT microcomputer was utilized to process cardiac data and affective ratings in response to imagery trials. Additionally, a Scientific Solutions LabMaster interface board, which includes a programmable clock, was utilized to automate laboratory procedures. Stimulus presentation and data acquisition was controlled via Virtual Processing Machine (VPM) software (Cook, Atkinson, & Lang, 1987). Cardiac reactivity was monitored and data were processed using standard Beckman 16mm silver-silver chloride electrodes attached to the ventral-medial surface of the right and left forearms and computer-interfaced Coulbourn Instruments (CI) modules consisting of a CI S75-01 High Gain Bioamplifier/Coupler, and a Schmitt trigger apparatus (CI Bipolar Comparator, S21-06, and a CI Retriggerable One Shot, S52-12). The Schmitt trigger apparatus was used to detect cardiac R waves and to signal the computer to record interbeat intervals.

Prerecorded imagery scripts were presented using a Radio Shack CCR-81 model audiocassette recorder. Periodic observation of the subject was possible by a one-way mirror between rooms.

The subjects made judgments about their affective responses to imagery scenes using the Self-Assessment

Manikin (SAM; Lang, 1980). SAM is a computer-controlled video character, by which subjects independently manipulate three separate dimensions identified by Russell and Mehrabian (1974) as comprising the experience of anxiety: valence (i.e., happy--sad), arousal (i.e., aroused--calm), and dominance (i.e., in control--controlled). The ratings from these three dimensions were quantified on a 21 point scale (0-20), with higher ratings indicative of more positive valence, higher arousal, and greater dominance. Additionally, judgments about vividness of imagery were recorded in a similar fashion.

Procedure

Screening session. Subjects were screened for participation via administration of the PRCS and SADS questionnaires to entire introductory psychology classes. Subjects were invited to participate in extra credit research based on their responses on the PRCS and SADS. Subsequent to an oral informed consent procedure outlining students' rights of refusal to participate, the nature of the questionnaires to be presented, and the risks and benefits of participation, subjects completed the screening questionnaires.

Laboratory session. Subjects whose screening questionnaires responses were in accordance with specified criteria were invited for participation in an additional laboratory imagery/cognitive task assessment procedure. Subsequent to an initial introduction to the general purpose of the experiment and the methodology employed, subjects read and signed an informed consent form and were given a tour of the laboratory and recording instruments.

Following the tour of the laboratory, a standard fear/anxiety assessment battery of questionnaires was administered in the order listed in the materials section. Upon completion of the assessment battery, subjects were escorted to the reclining chair in the imagery room for a cognitive Stroop assessment and an imagery assessment procedure. All subjects first completed a series of fear/anxiety and depression questionnaires; then half of the subjects in each group completed either the Stroop procedure or the imagery assessment procedure first, followed by the remaining procedure.

Imagery Assessment Phase

During this imagery procedure, cardiac, affective, and imagery vividness responses to eight standard fear,

action, and neutral audio scripts were recorded. Initially, electrodes were attached, and the EKG signal was tested for clarity. Upon obtaining an adequate EKG signal, the SAM ratings procedure was explained and demonstrated for the subject. Subsequent to the procedural explanation of SAM, the subject practiced making affective and imagery vividness ratings utilizing SAM. Video feedback of the subject's rating figures was presented via an Emerson EC-131 video monitor in full view of the subject. Subsequent to the acclimation to SAM, the imagery assessment procedure began with the lights dimmed; the subject was instructed to close his/her eyes, with the chair partially reclined.

Each subject began with audiotaped relaxation instructions (see Appendix A). The first imagery trial was always a neutral script (i.e., waiting at a bus stop) in order to aid in the habituation of subjects to the imagery procedure. These data were not included in the data analysis. Subsequent to the first script, the remaining anxiety, action, and neutral scripts were pseudo-randomly presented.

Audiotaped scripts. Various content areas were represented in the scripts: (a) public speaking

anxiety, (b) general social anxiety, (c) action, and (d) neutral (see Appendix B). Each anxiety and action script contained physiologically arousing response propositions (Lang, 1985) in order to amplify reactivity to experimental stimuli. There were two scripts depicting public speaking anxiety (i.e., a speech in class emphasizing the size of the audience and visibility of the participant, and a speech in class emphasizing the importance of the presentation for achieving a passing grade). Additionally, two scripts pertaining to general social anxiety (i.e., experiencing disapproval and criticism from a professor, not knowing anyone at a party) were utilized. In addition to the anxiety scripts, two action and two neutral scripts were presented. The action scripts contained response propositions, but lacked affective material (i.e., flying a kite, riding a bicycle). The two neutral scripts contained neither physiological responses nor affective statements (i.e., sitting in a lawn chair, sitting in a living room). The other neutral script, depicting waiting at a bus stop, was always presented immediately subsequent to the relaxation instructions.

Order of script presentation. Subsequent to the initial relaxation instructions (e.g., for the subject to close his/her eyes and find a comfortable position in the chair) and neutral script, scripts were selected without replacement from one of the four content areas (i.e., public speaking anxiety, general social anxiety, action, and neutral) in a pseudo-random fashion (ABCD). The remaining scripts from each content category were presented in the order CDBA to avoid consecutive presentation of two trials from the same category. Action and neutral scenes were interspersed as to avoid consecutive presentation of fear/anxiety scenes. In accordance with these specifications, the order of presentation was randomly selected, but counterbalanced for script order across groups to control for order effects.

Imagery trials. Cardiac data were recorded in four consecutive phases of each imagery trial: (a) a 30 second Baseline period preceding each script presentation, (b) a 30-50 second Read period during which the audiotaped script was presented (cardiac data from only the last 30 seconds of this period were recorded in order to control for variance due to differences in script length), (c) a 30 second Image

period in which subjects imagined the script, and (d) a 30 second Recovery period in which the individual was instructed to discontinue imagining the script and to commence relaxation. The onset of the recovery period was signalled via a one second 1,000 Hz tone. To signal the end of the recovery period, another one second 1,000 Hz tone was presented. Subjects were instructed to keep their eyes closed except when making ratings to reduce visual distraction and to facilitate imagery. Subsequent to the recovery period, subjects were instructed to open their eyes and record their affective and vividness responses via the SAM ratings. Upon completion of the SAM ratings, subjects were instructed to close their eyes and prepare for the next trial. Intertrial intervals ranged between 10 s to 60 s in duration in order to allow for subjects' cardiac responsivity to return to baseline.

Stroop Color-Naming Assessment Phase

There were seven forms of the Stroop color-naming test utilized in order to assess the degree of anxiety interference in subjects' performance of this cognitive task. As previously mentioned, the Stroop procedure calls for subjects to name the ink color of a variety of printed words. All forms consisted of 71 cm X 71 cm

posterboard with lettering that was 1.6 cm in height. Each form's stimuli (words) were color printed in blue, red, yellow, green and black ink on a white card. The order of colors and words and word/color pairings were randomized throughout all seven forms, with the exception that no color/word pairing appeared twice in succession. Each word appeared 20 times on each card for a total of 100 stimulus words per card (except the practice card, in which each word appeared 10 times for a total of 50 stimulus words). Additionally, each color appeared 20 times on each card for a total of 100 color presentations per card.

Each anxiety Stroop form (i.e., public speaking anxiety form and general social anxiety form) was matched with a respective control form. These anxiety control forms consisted of five words matched with their respective anxiety forms' words on number of letters, number of syllables, and frequency of word use in English language, in which words were matched within a 10% frequency of occurrence interval (Carroll, Davies, & Richman, 1971).

Stroop test forms. There were seven forms of the Stroop task employed in this study:

1. Practice Form: This card was half as long as the other cards. It served to help subjects become habituated to the Stroop task. The practice card contained fewer stimuli than the other cards in order to shorten the duration of the laboratory session. It consisted of five neutral words (i.e., towel, leaves, house, pillow, cloth) appearing 10 times each.

2. Public speaking anxiety form: This card contained five public speaking anxiety related words (i.e., speech, audience, public, stage, presentation).

3. Public speaking anxiety control form: This card contained five neutral control words (i.e., clouds, elephant, nature, roads, subdivisions) matched with the public speaking form's words, as previously mentioned.

4. General social anxiety form: This card contained five general social anxiety words (i.e., party, date, interview, conversation, meeting).

5. General social anxiety control form: This card contained five neutral control words (i.e., cover, noon, teakettle, temperatures, windows) matched with

the general social anxiety form in the manner described previously.

6. Modified Stroop form: This card contained the five color words blue, red, yellow, green and black. No color word was printed in its own color.

7. Modified Stroop control form: This card contained groups of five X's (i.e., XXXXX) printed a total of 100 times in the colors previously mentioned.

Stroop trials. The Stroop procedure was first explained to each subject. All subjects were asked to identify the five stimulus colors utilized in the study. Subjects who could not correctly identify or differentiate the five stimulus colors were excluded from participation.

Subjects were instructed to proceed with the task as quickly and accurately as possible. When subjects understood the task, they were presented with the practice form in order to facilitate acclimation to the task. When the subject had grasped the requirements of the practice task, the first Stroop form was administered. Each card was timed by the experimenter using a digital stopwatch. The intertrial interval was approximately one minute, allowing the experimenter to

record the subject's Stroop performance time and number of errors.

There were two measures utilized to assess degree of anxiety interference during each Stroop trial. First, an index of anxiety interference for each anxiety Stroop test was computed by subtracting the number of seconds required to complete the control card from the number of seconds required to complete its respective stimulus card (e.g., time for public speaking anxiety form minus time for public speaking anxiety control form). Second, subject errors were counted and recorded during each Stroop card trial.

Order of Stroop form presentation. Presentation order was randomized with the exception that the practice card was always administered first. Subsequent to the practice card, Stroop cards were selected randomly without replacement from the three content areas in a pseudo-random fashion (ABC). The remaining Stroop cards from each content category were presented in the order BCA to avoid consecutive presentation of two Stroop cards from the same category. Non-anxiety Stroop cards (i.e., public speaking control, general social control, modified Stroop form and its control card) were interspersed as

to avoid consecutive presentation of anxiety Stroop cards (i.e., public speaking anxiety and general social anxiety cards).

Results

Data Reduction and Preliminary Analyses

The VPM computer program package (Cook et al., 1987) was used to calculate medians for heart rate (in beats per minute) for the initial three-minute baseline and the periods within each of the eight script trials subsequent to the bus stop practice script. Change scores were calculated for the read and image periods by subtracting the median heart rate value for the baseline period that preceded them. Heart rate data from recovery periods were not used in statistical analyses as they were used to provide a sufficient inter-stimulus interval for subjects to return to baseline (Cook et al., 1988). Additionally, read and image change scores were averaged to obtain an overall heart rate change score across read and image periods for each imagery content area, as per previous research in the area (Cook et al., 1988). For each subject, values for the two scripts within each imagery category (i.e., speech, social, action and neutral) were averaged to obtain an overall heart rate change score.

Means of these values, across subjects, were then calculated and used in statistical analyses.

Initially, a two-way analysis of variance (ANOVA) was proposed to analyze differences among four groups. A one-way ANOVA was utilized, however, deleting one group (a low speech anxiety-high generalized social anxiety group), that had been planned to be included. Previous research (McNeil & Lewin, 1992) suggests that the low-high group may represent an artifact of selection procedures. Conceptually, it would seem very difficult to find individuals with generalized social anxieties without concomitant anxieties about public speaking. This decision to not analyze the low-high group's data is consistent with other social anxiety research in which efforts have focused on generalized (high-high) and circumscribed (high-low) individuals.

One-way ANOVA's were utilized to examine differences for verbal report and Stroop data across the generalized, circumscribed, and control groups. For imagery data, 3 X 4 ANOVA's were utilized examining differences for heart rate and SAM ratings across three groups by content areas (speech, social, action, and neutral). In all analyses, significant ANOVA's were

followed-up with Tukey's Honestly Significant Difference tests at the .05 alpha level.

A one-way ANOVA by group indicated no differences in heart rate during the initial three-minute baseline ($F(2,45) = 0.05, p > .10$). Heart rate means (in beats per minute) for the three groups were as follows: generalized = 74.1 ($SD = 10.5$), circumscribed = 67.0 ($SD = 13.7$), and control = 68.5 ($SD = 11.8$).

Initial Assessment Verbal Report Instruments

Table 1 presents data from questionnaires, along with results from one-way ANOVA's. Selection of subjects using the PRCS and SADS was successful. The generalized and circumscribed groups manifested greater reports of public speaking anxiety (PRCS scores) than

 Insert Table 1 about here

the control group. Additionally, the generalized social anxiety group indicated greater reports of general social anxiety (SADS scores) than either the circumscribed or control groups.

Questionnaire results indicate that the generalized social anxiety group manifested greater negative evaluation fears (FNE scores), general

fearfulness (FSS-III scores), and trait anxiety (STAI-Trait scores) than the control group. Additionally, the generalized group exhibited greater negative evaluation fears and overall social anxiety (SPAI total scores) than both controls and the circumscribed speech anxiety group. Moreover, the generalized group and not the circumscribed group reported levels of social anxiety consistent with published social phobia norms (Turner et al., 1988). (SPAI total scores at or above 80 are suggestive of social phobia. Only the generalized group had a mean above 80.) No differences among the groups were noted for imagery ability (QMI scores) or depression (BDI scores). The circumscribed group had more negative evaluation fears, greater overall social anxiety and general fearfulness than the nonanxious control group.

Speech Anxiety, Social Anxiety and Modified Stroop

Tests

The modified Stroop test was utilized as a baseline measure of color-naming ability among groups. One-way ANOVA's revealed no group differences in interference scores, raw response time to color words, or errors in color-naming, suggesting the groups did not differ in baseline color naming ability. Table 2

presents data from the Stroop tests. ANOVA's were non-significant for all measures by group.

 Insert Table 2 about here

Imagery Assessment

Cardiac responsivity to imagery content. A 3 X 4 ANOVA was utilized to examine differences among groups by content. Results did not reveal a significant interaction ($F(6,135) = 0.56, p > .10$). This test did reveal a significant main effect for content ($F(3,45) = 4.85, p < .005$). Specifically, greater cardiac responsivity as measured by heart rate change over baseline was found for speech scenes than for neutral scenes. The average heart rate acceleration for speech scenes was 1.9 beats per minute ($SD = 2.9$) and 0.2 for neutral scenes ($SD = 2.7$). There were no significant differences among the other content areas or for the group main effect ($F(2,45) = 0.31, p > .10$).

Valence ratings. A 3 X 4 group by content ANOVA yielded a significant group by content interaction ($F(6,135) = 3.09, p < .05$). Figure 1 presents valence (i.e., subjects' ratings of the relative positivity or

negativity of their experience while imagining scenes) data. Controls reported significantly less negative

 Insert Figure 1 about here

affective experience during speech scenes, but not in general social scenes, than both fear/anxiety groups. All groups reported more pleasant affective experiences in nonfear/anxiety scenes than in fear/anxiety scenes.

Arousal ratings. A 3 X 4 group by content ANOVA was conducted to examine group and content differences. Results did not demonstrate group by content interaction ($F(6,135) = 2.03, p > .05$). A significant content main effect emerged ($F(3,45) = 209.87, p < .001$). Specifically, fear/anxiety scenes, speech ($M = 17.23, SD = 2.8$) and social ($M = 15.9, SD = 2.7$), were rated as more arousing by all subjects than both action ($M = 13.9, SD = 3.9$) and neutral scenes ($M = 4.7, SD = 3.1$). Additionally, action scenes were rated as more arousing than neutral ones. No group main effect was found ($F(2,45) = 1.53, p > .10$).

A separate 2 X 2 group by content ANOVA examining the two fear/anxiety groups and fear/anxiety scenes yielded a significant group by content interaction

($F(1,30) = 9.76, p < .005$). Figure 2 presents data from this analysis. Specifically, the generalized group manifested significantly greater reports of

Insert Figure 2 about here

arousal in social scenes than the circumscribed group; the two groups did not differ on reports of arousal in speech scenes. Additionally, the circumscribed group reported less arousal in the social scenes than in their own fear/anxiety-relevant speech scenes.

Dominance ratings. A 3 X 4 group by content ANOVA yielded a significant group by content interaction ($F(6,135) = 3.53, p < .005$). Figure 3 presents dominance (i.e., verbal report of degree of perceived control) data from this analysis. Controls reported

Insert Figure 3 about here

greater dominance in speech scenes than both fear/anxiety groups. This finding did not hold true for social scenes. All groups reported greater dominance in nonfear/anxiety scenes than in fear/anxiety scenes.

Vividness ratings. A 3 X 4 group by content ANOVA yielded a significant group by content interaction ($F(6,135) = 2.19, p < .05$). Figure 4 presents vividness (i.e., verbal report of clarity of imagery) data from this analysis.

Insert Figure 4 about here

Controls reported greater imagery vividness in action scenes than both fear/anxiety groups. No other differences for vividness were found.

Discussion

Distinctions Between Circumscribed Speech Anxiety and Generalized Social Anxiety

Current results partially support the notion of differential pathological conditions in the circumscribed and generalized groups. Results demonstrate that these two groups can be differentiated on verbal report and some imagery responsivity. Specifically, the generalized group demonstrated greater reports of negative evaluation anxieties, more generalized social anxieties and greater reports of arousal in social scenes than the circumscribed group. Moreover, the circumscribed group had scores on the

SPAI which were below established cutoffs for social phobia (Turner et al., 1989); these scores for the generalized group were above the cutoff. The generalized group, and not the circumscribed group, manifested reports of social anxieties consistent with normed clinical populations suggestive of clinically significant differences between these two groups. The circumscribed group reported less arousal to fear/anxiety scenes not related to their phobic content (e.g., social scenes) than to fear/anxiety-relevant speech scenes. Additionally, the generalized group demonstrated consistent high arousal, negative valence, and low dominance in all fear/anxiety scenes, as well as manifesting SPAI scores above established cutoffs for social phobia. These differences suggest a generalized negative response tendency to all social contexts that does not seem to be as prevalent in the circumscribed speech anxiety group.

In addition to differences between fear/anxiety groups, both fear/anxiety groups demonstrated significantly greater reports of general fearfulness, social anxieties, and fears of negative evaluation than the control group. Additionally, controls demonstrated more positive valence and feelings of dominance and

control in speech scenes than both fear/anxiety groups. These findings demonstrate the viability of both the generalized and circumscribed subtypes as diagnostic entities. Specifically, both the circumscribed and generalized groups differ from each other, but each also exhibits greater fear/anxiety than normals. These findings are consistent with previous research (McNeil & Lewin, 1986, 1992; Heimberg et al., 1987) in which public speaking phobias were shown to be a less pervasive condition than generalized social phobias.

In summary, both groups demonstrated considerable fear/anxiety and negative responsiveness in their fear/anxiety-relevant scenes when compared to controls. Additionally, the generalized group exhibited a more pervasive negative response tendency across various social scenes, lending support to the notion of social phobia as a heterogeneous condition.

Replication of Findings from the Bioinformational Theory

As predicted, there were differences consistent with the bioinformational theory of processing fear/anxiety information. All groups demonstrated differential responsivity across imagery scene contents. Specifically, groups demonstrated modest

cardiac acceleration over baseline to fear/anxiety scenes and action scenes, relative to neutral scenes. Additionally, subjects exhibited greater heart rate reactivity to speech scenes than to neutral ones. Moreover, all groups manifested differential verbal report to imagery scenes. Specifically, subjects reported more negative valence, more arousal, and less dominance to fear/anxiety scenes than to neutral ones. These content differences are consistent with previous research utilizing a bioinformational framework (Cook, et al., 1988; Lang et al., 1983; McNeil & Brunetti, 1992; McNeil et al., 1992;).

Current findings generally support the bioinformational theory of fear/anxiety information processing. Predicted differences in emotional response based upon this theory, however, were equivocal. Specifically, the generalized and circumscribed groups were differentiated only on verbal report of arousal during fear/anxiety scenes, in which the circumscribed group demonstrated less arousal in social scenes than the generalized group. The circumscribed group also manifested less arousal in social scenes than in speech scenes. However, the

groups were not differentiated on cardiac responsivity or other imagery verbal report in fear/anxiety scenes.

Equivocal Results and Implications for Future Research

In general, the utility of conceptualizing fear/anxiety imagery and use of verbal report within the framework of the bioinformational theory to assess nosological variance was partially supported in the current study. Additionally, partial support for distinguishing circumscribed speech and generalized social anxieties was found. Several hypotheses, however, were not completely supported in the current study (i.e., differential cardiac responsivity between groups during imagery scenes, differential response latencies on Stroop tasks, differential verbal reports of depression and general anxiety) and deserve further investigation.

Past research has delineated circumscribed and generalized groups on measures of depression (Carter et al., 1992; Heimberg, et al., 1987), measures of trait anxiety and general fearfulness (Carter et al., 1992; Heimberg et al., 1987; McNeil & Lewin, 1992,1986) and Stroop interference (Hope et al., 1990; Lunsford et al., 1991). The current investigation did not reveal depressive or general anxiety differences between

groups. Additionally, the two groups did not demonstrate significant differences on the Stroop tasks and did not demonstrate cardiac reactivity differences from each other or the control group in either fear/anxiety or non-fear/anxiety scenes.

Limitations of the current study offer several possible explanations for equivocal findings. Subject selection in the current study utilized highly anxious, but nonclinical undergraduate students as opposed to clinical patients. It is possible that differences between these nonclinical subjects and clinical patients disallowed demonstration of the individual uniqueness of circumscribed and generalized groups. Recent research has differentiated circumscribed speech and generalized social anxiety groups on Stroop variables using clinical populations (Hope et al., 1990; Lunsford et al., 1991). Additionally, the current study utilized a 90th percentile cutoff for high fear/anxiety and 50th percentile for low fear/anxiety. It is possible that the cutoffs utilized did not provide enough spread between groups, masking differences between groups other researchers have been able to identify (Heimberg et al., 1988; McNeil et al., 1992). Further, the large Stroop stimulus cards

employed in the current study may have been too cumbersome for subjects to respond to easily.

Another issue in the study of fear/anxiety is the use of degraded stimuli (e.g., imaginal versus in vitro) to provoke fear/anxiety responses. Specifically, subjects in the current study were not actually exposed to their fear/anxiety relevant stimuli in vitro. It is possible that fear/anxiety responsiveness and group differences would emerge with the use of in vitro stimuli (e.g., groups actually giving speeches and conversing in laboratory). Previous researchers have differentiated groups on various measures using in vitro versus imaginal stimuli (Heimberg, et al., 1988; McNeil & Lewin, 1992). Some investigators have utilized response training, a procedure involving training of subjects in both progressive muscle relaxation and imagery enhancement strategies designed to amplify responsiveness to imagery scripts. This procedure is purported to enhance differentiated reactivity equally across groups and correct for limitations of degraded imaginal stimuli (McNeil & Brunetti, 1992; Miller, et al., 1987). It is possible that if subjects in the current

investigation were given response training, more of the predicted group differences would have emerged.

Finally, the equivocal findings in this study may reflect a similarity between circumscribed and generalized groups. It is possible that hypothesized differences between groups are not as profound as predicted. Future research in the area can address the aforementioned limitations through research utilizing both imaginal and in vitro fear/anxiety stimuli, computerized Stroop assessments, response training, and use of either clinical subjects or more highly anxious undergraduates (e.g., 95th percentile), allowing for a less restricted spread between high and low fear/anxiety groups.

References

- American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed., Revised). Washington, DC: Author.
- Barlow, D. H. (1988). Anxiety and its disorders: The nature and treatment of anxiety and panic. New York: Guilford.
- Beck, A. T. (1976). Cognitive therapy and emotional disorders. New York: International universities.
- Beidel, D. C., Turner, S. M., & Dancu, C. V. (1985). Physiological, cognitive, and behavioral aspects of social anxiety. Behaviour Research and Therapy, 23, 109-117.
- Betts, G.H. (1909). The distribution and functions of mental imagery. Teachers College: Columbia University Press.
- Borkovec, T., & Rachman, S. (1979). The utility of analogue research. Behaviour Research and Therapy, 17, 253-261.
- Brooks, R. B., Baltazar, P. L., & Munjack, P. J. (1989). Co-occurrence of personality disorders with

panic disorder, social phobia, and generalized anxiety disorder: A review of the literature. Journal of Anxiety Disorders, 3, 258-285.

Carroll, J. B., Davies, P., & Richman, P. (1971).

Word frequency book. Boston: Houghton Mifflin.

Cohen, J. D., Dunbar, K., McClelland, J. L. (1990). On the control of automatic processes: A parallel distributed processing account of the Stroop effect. Psychological Review, 97, 332-361.

Cook, E. (1987). Stimulus control and data acquisition for IBM PC's and compatibles. Psychophysiology, 24, 726-727. (Abstract)

Cook, E. W., III, Melamed, B. G., Cuthbert, B. N., McNeil, D. W., & Lang, P. J. (1988). Emotional imagery in the differential diagnosis of anxiety. Journal of Consulting and Clinical Psychology, 56, 734-740.

Curran, J. P., & Gilbert, F. S. (1975). A test of the relative effectiveness of a systematic desensitization program and an interpersonal skills training program with date anxious subjects. Behavior Therapy, 6, 510-521.

- Dyer, F. N. (1973). The stroop phenomenon and its use in the study of perceptual, cognitive and response processes. Memory and Cognition, 1, 106-120.
- Ellis, A. (1977). Handbook of rational-emotive therapy. New York: Springer.
- Glass, C. R., Merluzzi, T.V., Biever, J. L., & Larsen, K. H. (1982). Cognitive assessment of social anxiety: Development and validation of a self-statement questionnaire. Cognitive Therapy and Research, 6, 37-55.
- Heimberg, R. G., & Barlow, D. H. (1988). Psychosocial treatments for social phobia. Psychosomatics, 29, 27-37.
- Heimberg, R. G. & Holt, C. S. (1991). The issue of subtypes in the diagnosis of social phobia. Manuscript submitted for publication.
- Heimberg, R. G., Hope, D. A., Dodge, C. S., & Becker, R. E. (1987, November). An examination of DSM-III-R subtypes of social phobia. Poster presented at the annual meeting of the Association for Advancement of Behavior Therapy, Boston, MA.
- Heimberg, R. G., Hope, D. A., Dodge, C. S., & Becker, R. E. (1990). DSM-III-R subtypes of social phobia: Comparison of generalized social phobics and public

- speaking phobics. Journal of Nervous and Mental Disease, 178, 172-179.
- Herbert, J. D., Hope, D. A., & Bellack, A. S. (1992). Validity of the distinction between generalized social phobia and avoidant personality disorder. Journal of Abnormal Psychology, 101, 332-339.
- Hope, D. A., Rapee, R. M., Heimberg, R. G., & Dombek, M. J. (1990). Representations of the self in social phobia: Vulnerability to social threat. Cognitive Therapy and Research, 14, 177-189.
- Holt, C. S., Heimberg, R. G., & Hope, D. A. (1992). Avoidant personality and the generalized subtype of social phobia. Journal of Abnormal Psychology, 101, 318-325.
- Kazdin, A. E. (1978). Evaluating the generality of findings in analogue therapy research. Journal of Consulting and Clinical Psychology, 46, 673-686.
- Lang, P. J. (1977). Imagery in therapy: An information processing analysis of fear. Behavior Therapy, 8, 862-886.
- Lang, P. J. (1980). Behavioral treatment and bio-behavioral assessment: Computer applications. In J. B. Sidowski, J. H. Johnson, & T. A. Williams (Eds.),

- Technology in mental health care delivery systems.
Norwood, NJ: Ablex Publishing Company.
- Lang, P. J. (1985). The cognitive psychophysiology of emotion: Fear and anxiety. In A. H. Tuma & J. D. Maser (Eds.), Anxiety and the anxiety disorders (p. 131-170). Hillsdale, NJ: Lawrence Erlbaum.
- Lang, P. J., Levin, D., Miller, G., & Kozak, M. (1983). Fear behavior, fear imagery, and the psychophysiology of emotion: The problem of affective response integration. Journal of Abnormal Psychology, 92, 276-306.
- Lang, P. J., Melamed, B. G., & Hart, J. (1970). A psychophysiological analysis of fear modification using an automated desensitization procedure. Journal of Abnormal Psychology, 76, 220-234.
- Leary, M. R. (1983). Social anxiousness: The construct and its measurement. Journal of Personality Assessment, 47, 66-75.
- Liebowitz, M. R., Gorman, J. M., Fyer, A. J., & Klein, D. F. (1985). Social phobia. Archives of General Psychiatry, 42, 729-736.
- Lewin, M. R., & McNeil, D. W. (1987, November). Verbal dysfluencies associated with social anxiety: A microanalytic approach. Poster presented at the

meeting of The Association for Advancement of
Behavior Therapy, Boston, MA.

Lunsford, L. J., Boone, M. L., Carter, L. E., Carter,
B. S., & McNeil, D. W. (1991). Comparison of social
phobia Stroop tests. Poster presented at the
meeting of the Association for Advancement of
Behavior Therapy, New York, NY.

MacLeod, C. M. (1991). Half a century of research on
the Stroop effect: A integrative review.
Psychological Bulletin, 109(2), 163-203.

Marks, I. M. (1987). Fears, phobias, and rituals. New
York, NY: Oxford University Press.

Marks, I. M. (1985). The classification of phobic
disorders. British Journal of Psychiatry, 116, 377-
386.

Marlodo, G. K. (1981). Shyness and loneliness among
college men and women. Psychological Reports, 48,
875-886.

Mathews, A., & MacLeod, C. (1986). Selective
processing of threat cues in anxiety states.
Behaviour Research and Therapy, 23, 563-569.

McNeil, D. W., & Lewin, M. R. (1986, November). Public
speaking anxiety: A meaningful subtype of Social
Phobia? Poster presented at the meeting of the

Association for Advancement of Behavior Therapy,
Chicago, IL.

McNeil, D. W. & Lewin, M. R. (1992). An empirical demonstration of public speaking as a type of social anxiety. Manuscript submitted for publication.

McNeil, D. W., Vrana, S. R., Melamed, B. G., Cuthbert, B. N., & Lang, P. J. (1992). Emotional imagery in simple and social phobia: Fear vs. anxiety. Manuscript submitted for publication.

McNeil, D. W., Vrana, S. R., Melamed, B. G., & Lang, P. J. (1985, November). Affective response to fear imagery: Individual differences in phobic populations. Poster presented at the meeting of the Association for Advancement of Behavior Therapy, Houston, TX.

Meichenbaum, D. H., Gilmore, J. B., & Fedoravicious, A. (1971). Group insight versus group desensitization in treating speech anxiety. Journal of Consulting and Clinical Psychology, 36, 410-421.

Nyman, D., & Heimberg, R. G. (1985, November). The diagnostic validity of social phobia. Poster presented at the meeting of The Association for Advancement of Behavior Therapy, Houston, TX.

- Pardo, J. V., Pardo, P. J., Janer, K. W., & Raichle, M. E. (1990). The anterior singulate mediate processing selection in the Stroop attentional conflict paradigm. Proceedings of the National Academy of Science USA, 87, 256-259.
- Paul, G. (1966). Insight versus desensitization in psychotherapy: An experiment in anxiety reduction. Stanford: Stanford University Press.
- Pilkonis, P. A., Feldman, H., & Himmelhoch, J. (1981). Social anxiety and substance abuse in the affective disorders. Comprehensive Psychiatry, 22, 451-457.
- Pollard, C. A., & Henderson, J. G. (1988). Four types of social phobia in a community sample. Journal of Nervous and Mental Disease, 173, 440-445.
- Richardson, A. (1969). Mental imagery. New York: Springer.
- Richardson, S. C., & Tasto, D. L. (1976). Development and factor analysis of a social anxiety inventory. Behavior Therapy, 7, 452-462.
- Robins, L. N., Helzer, J. E., Weissman, M. M., Orvaschel, H., Gruenberg, E., Burke, J. D. Jr., & Reiger, D. A. (1984). Lifetime prevalence of specific psychiatric disorders in three sites. Archives of General Psychiatry, 41, 949-958.

- Russell, J. A., & Mehrabian, A. (1974). Distinguishing anger and anxiety in terms of emotional response factors. Journal of Consulting Psychology, 42, 79-83.
- Sanderson, W. C., Rapee, R. M., & Barlow, D. H. (1987, November). The DSM-III-R revised anxiety disorders categories: Descriptions and patterns of comorbidity. Poster presented at the annual meeting of The Association for Advancement of Behavior Therapy, Boston, MA.
- Schlenker, B. R., & Leary, M. R. (1982). Social anxiety and self-presentation: A conceptualization and model. Psychological Bulletin, 92, 641-649.
- Schneier, F. R., Martin, L.Y., Liebowitz, M. R., Gorman, J. M., & Fyer A. J. (1989). Alcohol abuse in social phobia. Journal of Anxiety Disorders, 3, 15-23.
- Sheehan, P. W. (1967). A shortened version of Betts' questionnaire upon mental imagery. Journal of Clinical Psychology, 23, 386-389.
- Speilberger, C. D., (1983). Manual for the State-Trait Anxiety Inventory (STAI Form Y). Palo Alto, CA: Consulting Psychologists Press.

Spitzer, R. L., & Williams, J. B., (1985).

Classification of anxiety in DSM-III. In A. H. Tuma & J. D. Maser (Eds.), Anxiety and the anxiety disorders. Hillsdale NJ: Lawrence Erlbaum associates.

Stroop, J. R. (1938). Factors affecting speed in serial verbal reactions. Psychological Monographs, 50, 38-48.

Treisman, A. M. & Fearnley, S. (1969). The Stroop test: Selective attention to colours and words. Nature, 222, 437-439.

Trower, P., & Gilbert, P. (1989). New theoretical conceptions of social anxiety and social phobia. Clinical Psychology Review, 9, 19-35.

Turner, S. M., & Beidel, D. C. (1985). Empirically derived subtypes of social anxiety. Behavior Therapy, 16, 384-392.

Turner, S. M., & Beidel, D. C., (1989). Social phobia: Clinical syndrome, diagnosis, and comorbidity. Clinical Psychology Review, 9, 3-18.

Turner, S. M., Beidel, D. C., Dancu, C. V., & Stanley, M. A. (1988). An empirically derived inventory to measure social fears and anxiety: The Social Phobia and Anxiety Inventory. Psychological Assessment: A

Journal of Consulting and Clinical Psychology, 1,
35-40.

Turner, S. M., Beidel, D. C., & Larkin, K. T. (1986).
Situational determinants of social anxiety in clinic
and nonclinic samples: Physiological and cognitive
correlates. Journal of Consulting and Clinical
Psychology, 54, 523-527.

Turner, S. M., Beidel, D. C., & Townsley, R. M. (1992).
Social phobia: A comparison of specific and
generalized subtypes and avoidant personality
disorder. Journal of Abnormal Psychology, 101, 326-
331.

Twentyman, C. T., & McFall, R. M. (1975). Behavioral
training of social skills in shy men. Journal of
Consulting and Clinical Psychology, 43, 384-395.

Watson, D. & Friend, R. (1969). Measurement of social-
evaluative anxiety. Journal of Consulting and
Clinical Psychology, 33, 448-457.

Watts, F. N., McKenna, F. P., Sharrock, R., & Trezise,
L. (1986). Colour naming of phobia-related words.
British Journal of Psychology, 77, 97-108.

Weerts, T. C., & Lang, P. J. (1978). Psychophysiology
of fear imagery: Differences between focal phobia &

social performance anxiety. Journal of Consulting and Clinical Psychology, 46, 1157-1159.

Widiger, T. A. (1992). Generalized social phobia versus avoidant personality disorder: A commentary on three studies. Journal of Abnormal Psychology, 101, 340-343.

Wolpe, J. & Lang, P. J. (1964). A fear survey schedule for use in behavior therapy. Behaviour Research and Therapy, 2, 27-30.

Wolpe, J. & Lang, P. J. (1969). Fear Survey Schedule. San Diego, CA: Educational and Industrial Testing Service.

Zimbardo, P. G. (1977). Shyness: What it is, what to do about it. Reading, MA: Addison-Wesley.

Table 1

Mean scores for initial assessment verbal report instruments
(standard deviations in parentheses)

Instrument	Range	<u>Groups</u>		
		Generalized (High-High)	Circumscribed (High-Low)	Control (Low-Low)
		a	a	b
Personal Report of Confidence as a Speaker (PRCS)	0-30	26.7 (2.0)	26.6 (1.6)	8.8 ** (4.0)
		a	b	b
Social Avoidance and Distress Scale (SADS)	0-28	21.4 (3.2)	4.8 (1.8)	3.4 ** (1.9)
		a	b	c
Fear of Negative Evaluation scale (FNE)	0-30	23.9 (4.8)	14.0 (10.0)	8.0 ** (4.8)
		a	b	c
Social Phobia Anxiety Inventory- Social (SPAI-SOC)	0-192	116.7 (24.4)	71.3 (23.3)	44.4 ** (22.2)

(table continues)

Table 1 (continued)

		a	b	b
Social Phobia	0-78	29.9	18.9	15.9 *
Anxiety Inventory-		(19.8)	(10.3)	(10.0)
Agoraphobia (SPAI-AGOR)				
		a	b	c
Social Phobia	-78-192	87.6	52.4	28.5 *
Anxiety Inventory-		(27.5)	(21.5)	(16.3)
Total (SPAI-TOT)				
		a	a	b
Fear Survey	0-432	119.5	118.4	71.4 *
Schedule-III		(58.0)	(64.8)	(39.3)
(FSS-III)				
		a	a,b	b
State-Trait	20-80	46.1	38.1	33.1 *
Anxiety		(10.2)	(10.1)	(7.8)
Inventory-Trait				
(STAI-Trait)				
Beck Depression	0-63	9.8	7.9	5.6 NS
Inventory (BDI)		(7.1)	(8.3)	(4.7)
Questionnaire upon	35-245	86.8	89.1	75.8 NS
Mental Imagery (QMI)		(25.3)	(23.2)	(28.3)

(table continues)

Table 1 (continued)

Note. Higher scores indicate report of greater anxiety; Lower scores for the QMI indicate better imagery ability.

Note. PRCS and SADS scores are not considered as dependent variables. Group values are reported as these instruments were used for subject selection.

Note. Tukey's Multiple Comparison Tests were conducted subsequent to significant ANOVA's. Means that do not share a common superscript differ significantly at $p < .05$.

** * NS

$p < .0001$. $p < .01$. Not significant at .05 alpha level.

Table 2

Mean scores for Stroop tests(standard deviations in parentheses)

	<u>Groups</u>			<u>F</u>	<u>p</u>
	Generalized (High-High)	Circumscribed (High-Low)	Control (Low-Low)		
<u>Speech Stroop Test</u>					
Time	60.9 (6.0)	64.7 (9.0)	63.1 (9.6)	.81	NS
Errors	0.1 (0.3)	0.2 (0.4)	0.4 (0.5)	2.5	NS
Interference	1.9 (4.3)	0.0 (5.0)	1.2 (6.6)	.50	NS
<u>Social Stroop Test</u>					
Time	64.5 (6.5)	67.0 (10.5)	67.1 (11.9)	.36	NS
Errors	0.0 (0.0)	0.0 (0.0)	0.1 (0.3)	1.0	NS
Interference	0.0 (4.7)	1.0 (8.4)	1.9 (5.4)	.87	NS

(table continues)

Table 2 (continued)

	<u>Modified Stroop Test</u>				
Time	89.0	95.9	92.8	.59	NS
	(10.3)	(20.5)	(24.3)		
Errors	0.6	0.7	0.7	.02	NS
	(0.9)	(1.4)	(1.0)		
Interference	32.7	40.5	35.2	1.31	NS
	(9.3)	(15.0)	(16.6)		

Note. Stroop time and interference variables are presented in seconds; Stroop errors are presented as mean number of errors.

Note. All tests were nonsignificant (NS) at the .10 alpha level.

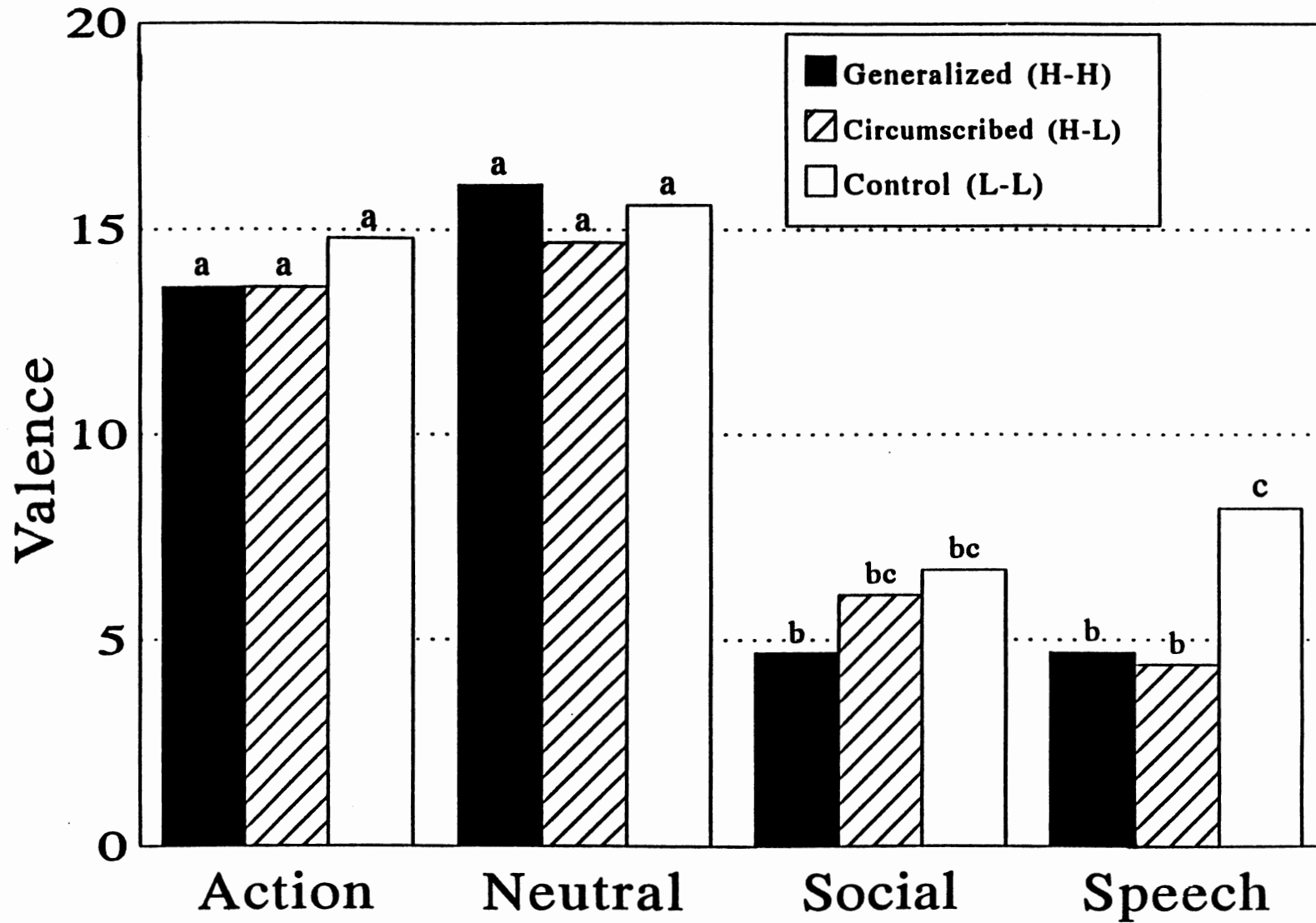
Figure Captions

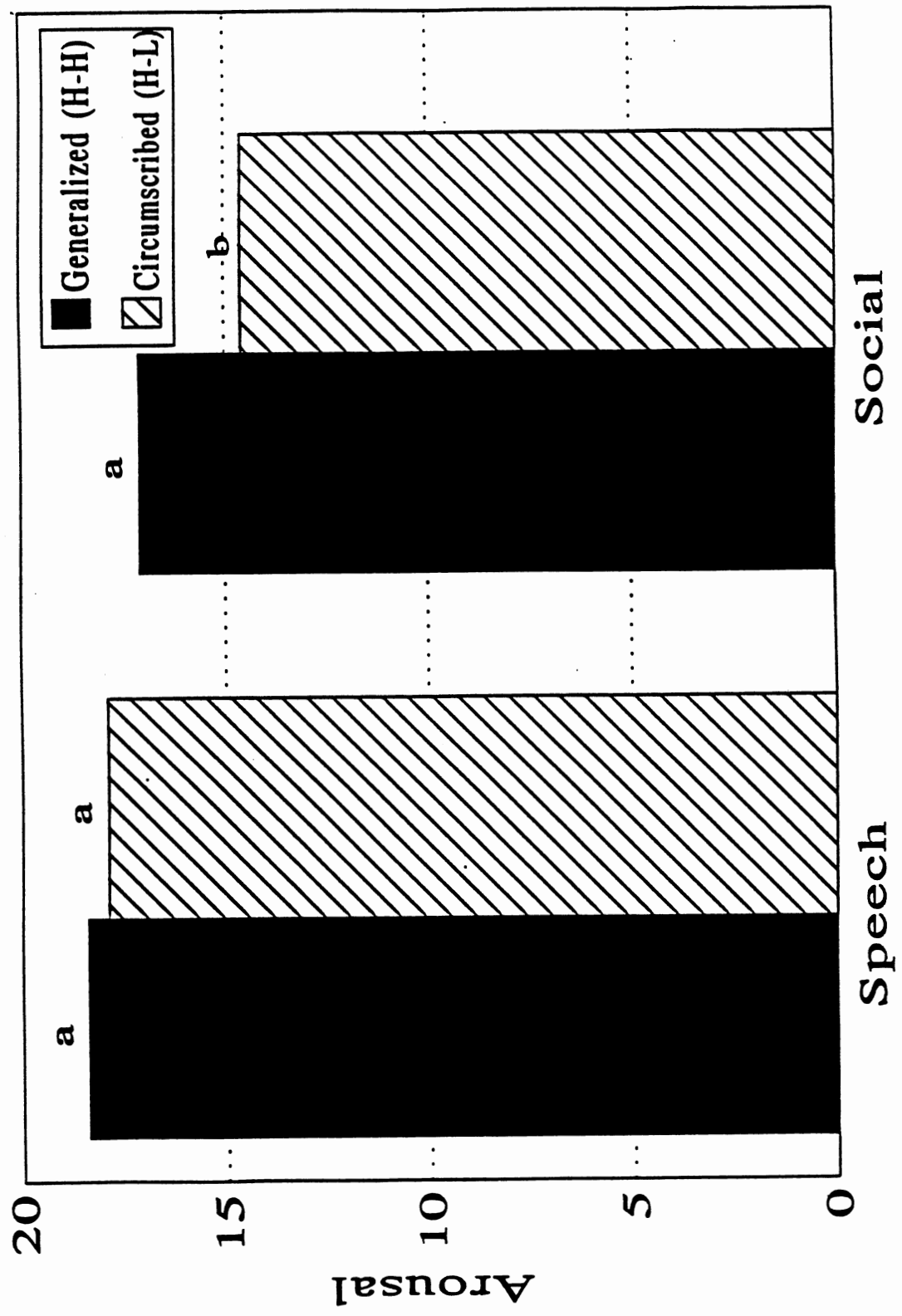
Figure 1. SAM valence ratings across all content areas. Histogram bars that do not share a common superscript differ significantly at $p < .05$.

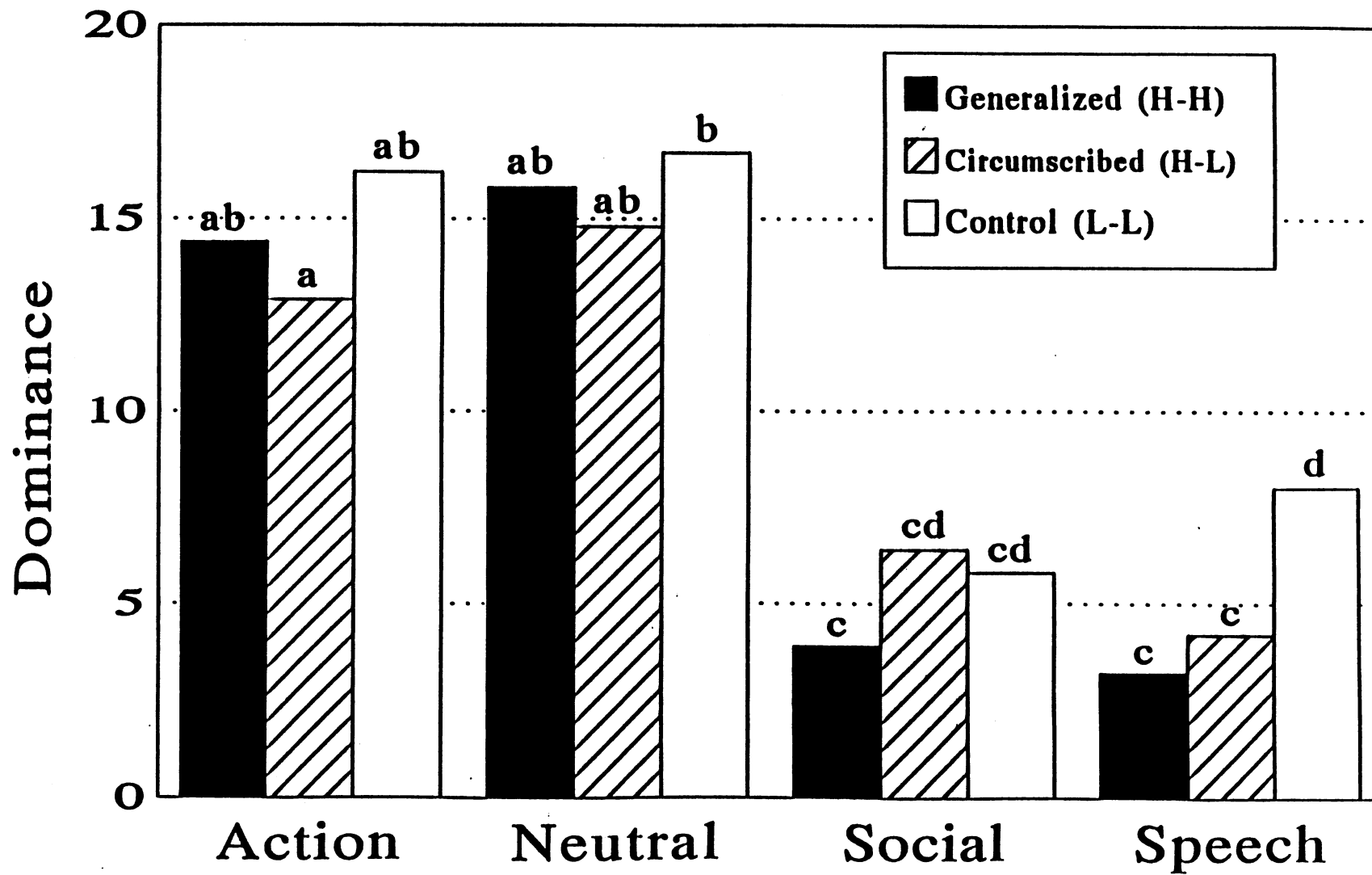
Figure 2. SAM arousal ratings across fear content areas. Histogram bars that do not share a common superscript differ significantly at $p < .05$.

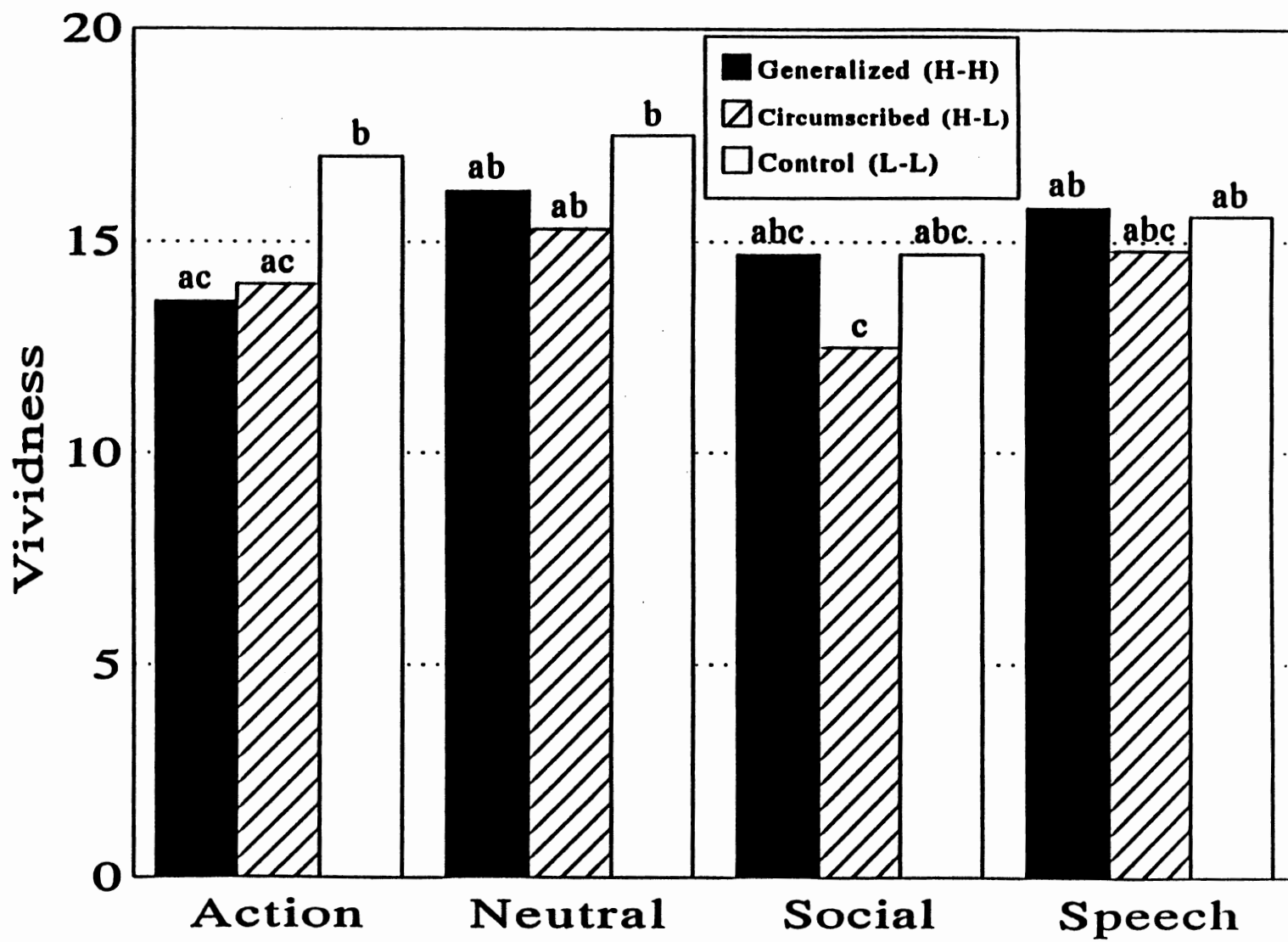
Figure 3. SAM dominance ratings across all content areas. Histogram bars that do not share a common superscript differ significantly at $p < .05$.

Figure 4. Vividness ratings across all content areas. Histogram bars that do not share a common superscript differ significantly at $p < .05$.









Appendix A

Relaxation Script

Position yourself in the chair as comfortably as you can. Uncross your feet or legs if they are crossed and allow your eyes to close. Now relax the muscles of your left forearm. Let your left forearm be limp, heavy, and calm. Let the relaxation spread to the muscles of your left arm. Let your left arm relax and be calm and warm. Relax the muscle of your right forearm. Let your right arm feel calm, warm, and relaxed. Now relax the muscle of your left leg. Let your left leg feel heavy, calm, and relaxed. And now, also relax your right leg. Let the muscles of your right leg feel calm, warm, and relaxed. Now relax the muscles near your stomach. Let the muscles near your stomach feel calm, warm, and relaxed. Now relax your forehead. Let your forehead muscles be calm, and relaxed. Let this relaxation spread to the muscles of your neck and shoulders. Let your neck and shoulders feel calm, warm, heavy, and relaxed. And now relax the muscles around your eyes. Let the muscles around your eyes be heavy, calm, and relaxed. Relax all the muscles of your body. Let your whole body be warm, calm, heavy, and relaxed.

Appendix B

Imagery Scripts

A. Public speaking anxiety scripts

1. Speech to class (grade contingent upon speech)

You have volunteered to give a presentation to a class in which you badly need to improve your grade. You have never addressed such a large group before. Your palms have become sweaty, and you tense up the muscles of your forehead. The hands of the clock inch forward, and your heart begins to race as the buzzer in the hall signals the start of class. As you walk to the front of the room, you breathe rapidly and glance around at the faces of the audience. The whole group looks up at you in silence, shifting restlessly in their seats.

2. Speech to class (large audience/visibility)

You are about to present some of your ideas to your class. Your heart pounds faster as you scan the room and notice for the first time how large the audience is. Originally, you did not notice how many professors and students were awaiting your presentation. Sweat pours from your forehead, as you fumble with your notes. As you stand up, your muscles are so tense that your hands begin to tremble

uncontrollably. The audience watches your every move in silence. Your breath catches in your throat as you try to utter your first words.

B. General social anxiety scripts

1. Reprimand from professor (social disapproval)

A few class meetings after turning in a required term paper in an important class, your instructor asks you to remain in the lecture hall when the period is over. Anticipating some problem, you notice that your muscles are so tense that your hands are trembling. After your classmates have left, your professor, speaking harshly, expresses a great deal of disappointment in your work on the paper, and you can feel your heart throbbing. You begin to perspire freely when errors in grammar and punctuation are pointed out. You glance at the clock in the room as the professor continues criticizing the term paper.

2. Unfamiliar party (social uncertainty/
visibility)

You walk into a party in which you do not know many people. The host of the party greets you and asks you who you are. As you look around at many people, you don't recognize anyone. You notice that your heart beats faster as people at the party stare at you. You

begin to perspire profusely as you frantically search for someone you know. After a few minutes of standing alone, you notice that your muscles are tight as you prepare to enter an on-going conversation. After you exchange greetings, there is an awkward silence, and you begin to breathe rapidly as you can not think of anything to say.

C. Action scripts

1. Bicycle action scene

On a clear Saturday morning you are riding your bicycle on a quiet country road. You breathe and sweat runs down your face while you pedal rapidly over the road. Ahead of you is a steep hill, and you tense your face and neck muscles, working to climb the hill. Your eyes look to the right at several chickens which scatter when you pass a large red barn. A rooster crows loudly from within the barn. Your heart races as you near the top.

2. Kite action scene

You breathe deeply as you run along the beach flying a kite. Your eyes trace its path as it whips up and down in spirals with the wind. The sun glares into your eyes from behind the kite, and you tense the muscles in your forehead and around your eyes to block

out the sunlight. You perspire freely in the warm sun. Your heart races while you run along the sand, leading the kite, whose long white tail dances beneath the soaring red diamond.

D. Neutral Scripts

1. Neutral bus stop script

You are sitting at a bus stop on the corner of a quiet, tree-lined street. It is a bright summer day and birds are flitting among the tree branches. You feel peacefully at ease under the trees and the white billowy clouds which drift slowly by in the blue sky. Across the street, a man in a brown shirt dozes on his patio, while a sprinkler sprays sparkling droplets of water over his lawn.

2. Neutral lawn chair script

You are sitting in a lawn chair on your porch on a summer afternoon. Leaning back, relaxed, you feel a soft warm breeze blowing across the porch. A green lawn stretches out before you, and scattered trees sway gently in the wind. Comfortable and content, you are so relaxed you hardly move while you sit in the chair enjoying the pleasant summer day.

3. Neutral living room script

You are in your living room reading on a Sunday afternoon. Leaning back in your chair, relaxed, you look out your window. It is a sunny autumn day. Red and brown leaves float slowly down from the trees. A yellow Volkswagon goes by in the street, scattering the blanket of leaves. A gentle breeze picks up a little spiral of leaves, which dances for a moment in the middle of the street before settling again on the ground.

VITAY

Michael R. Lewin

Candidate for the Degree of

Doctor of Philosophy

Thesis: CIRCUMSCRIBED VERSUS GENERALIZED SUBTYPES OF
SOCIAL PHOBIA: A COGNITIVE PSYCHOPHYSIOLOGICAL
INVESTIGATION

Major Field: Psychology: Clinical

Biographical:

Personal Data: Born in Queens, New York, July 30,
1961, the son of Mr. and Mrs. Charles Riess
Lewin.

Education: Graduated from Martin VanBuren High
School in June of 1979, Queens, New York;
received Bachelor of Arts Degree in Psychology
from The State University of New York at Albany in
May, 1983; received Master of Science Degree in
Psychology from Oklahoma State University in May,
1987; completed requirements for the Doctor of
Philosophy Degree at Oklahoma State University in
July, 1992.

Professional Experience: Clinical Specialist,
Newton Memorial Hospital, September, 1990 - March,
1992; Clinical Psychology Intern, Western
Psychiatric Institute and Clinic, September, 1989-
August, 1990; Mental Health Associate, Guthrie Job
Corps Center, September, 1988 - May, 1989;
Psychological Associate, Oklahoma State University
Psychology Department, September, 1986 - May,
1989.

Name: Michael Riess Lewin Date of Degree: July, 1992

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: CIRCUMSCRIBED VERSUS GENERALIZED SUBTYPES
OF SOCIAL PHOBIA: A COGNITIVE
PSYCHOPHYSIOLOGICAL INVESTIGATION

Pages in Study: 87 Candidate for the Degree of
Doctor of Philosophy

Major Field: Psychology: Clinical

Scope and Method of Study: This study examined differences in the cognitive processing of public speaking anxious and generally socially anxious individuals via imagery and Stroop color-naming assessments. From a pool of psychology students, 48 subjects were chosen for inclusion into one of three gender-balanced groups: a) high in both public speaking and general social anxieties (generalized group), b) high in public speaking anxiety and low in general social anxiety (circumscribed group), or c) low in both types of anxiety (control group). Cardiac and verbal report data were collected as subjects imagined a variety anxiety and nonanxiety scenes. Additionally, subjects color-named anxiety as well as control words in Stroop tasks.

Findings and Conclusions: Subjects high in both public speaking and general social anxieties manifested greater reports of negative evaluation fears, more pervasive social anxiety, and more arousal imagining social scenes than their circumscribed speech anxious counterparts. Also, both anxiety groups demonstrated more reports of social anxiety, and less reports of dominance and positive valence while imagining speech scenes, as compared to the control group. Speech scenes created greater cardiac acceleration over baseline than neutral scenes. Findings are discussed in relation to the bioinformational theory of emotion. Diagnostic implications are also considered.

ADVISOR'S APPROVAL

Daniel W. White, Ph.D.