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Selective attention biases: Alcoholics experiencing panic attacks versus non-panic alcoholics.

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Selective Attention Biases: Alcoholics Experiencing Panic Attacks Versus Non-panic Alcoholics

by

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- General 0679
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Literature
- General 0401
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- Canadian (English) 0352
- Canadian (French) 0355
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- Germanic 0311
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Religion
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Theology 0469

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American Studies 0323
Anthropology
- Archaeology 0324
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Business Administration
- General 0310
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Canadian Studies 0385
Economics
- General 0501
- Agricultural 0503
- Commerce-Business 0505
- Finance 0508
- History 0509
- Labor 0510
- Theory 0511

Folklore 0358
Geography 0366
Gerontology 0351
History
- General 0578
- Ancient 0579
- Medieval 0581
- Modern 0582
- Black 0328
- African 0331
- Asia, Australia and Oceania 0332
- Canadian 0334
- European 0335
- Latin American 0336
- Middle Eastern 0333
- United States 0337

History of Science 0585
Law 0398
Political Science
- General 0615
- International Law and Relations 0616
- Public Administration 0617

Recreation 0814
Social Work 0452
Sociology
- General 0626
- Criminology and Penology 0627
- Demography 0938
- Ethnic and Racial Studies 0631
- Individual and Family Studies 0628
- Industrial and Labor Relations 0629
- Public and Social Welfare 0630
- Social Structure and Development 0700
- Theory and Methods 0344

Transportation 0709
Urban and Regional Planning 0999
Women's Studies 0453

THE SCIENCES AND ENGINEERING

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Agriculture
- General 0473
- Agronomy 0285
- Animal Culture and Nutrition 0475
- Animal Pathology 0476
- Food Science and Technology 0359
- Forestry and Wildlife 0478
- Plant Culture 0479
- Plant Pathology 0480
- Plant Physiology 0817
- Range Management 0777
- Wood Technology 0746

Biology
- General 0306
- Anatomy 0287
- Biostatistics 0308
- Botany 0309
- Cell 0379
- Ecology 0329
- Entomology 0353
- Genetics 0369
- Limnology 0793
- Microbiology 0410
- Molecular 0307
- Neuroscience 0317
- Oceanography 0416
- Physiology 0433
- Radiation 0821
- Veterinary Science 0778
- Zoology 0472

Biophysics
- General 0786
- Medical 0760

EARTH SCIENCES
Biogeochemistry 0425
Geochemistry 0996
Geodesy 0370
Geology 0372
Geophysics 0373
Hydrology 0388
Mineralogy 0411
Paleobotany 0345
Paleoecology 0426
Paleontology 0418
Paleozoology 0985
Palynology 0427
Physical Geography 0368
Physical Oceanography 0415

HEALTH AND ENVIRONMENTAL SCIENCES
Environmental Sciences 0768
Health Sciences
- General 0566
- Audiology 0300
- Chemotherapy 0992
- Dentistry 0567
- Education 0350
- Hospital Management 0769
- Human Development 0758
- Immunology 0982
- Medicine and Surgery 0564
- Mental Health 0347
- Nursing 0569
- Nutrition 0570
- Obstetrics and Gynecology 0380
- Occupational Health and Therapy 0354
- Ophthalmology 0381
- Pathology 0571
- Pharmacology 0419
- Pharmacy 0572
- Physical Therapy 0382
- Public Health 0573
- Radiology 0574
- Recreation 0575
- Speech Pathology 0460
- Toxicology 0383

Home Economics 0386

PHYSICAL SCIENCES
Pure Sciences
Chemistry
- General 0485
- Agricultural 0749
- Analytical 0486
- Biochemistry 0487
- Inorganic 0488
- Nuclear 0738
- Organic 0490
- Pharmaceutical 0491
- Physical 0494
- Polymer 0495
- Radiation 0754

Mathematics 0405
Physics
- General 0605
- Acoustics 0986
- Astronomy and Astrophysics 0606
- Atmospheric Science 0608
- Atomic 0748
- Electronics and Electricity 0607
- Elementary Particles and High Energy 0798
- Fluid and Plasma 0759
- Molecular 0609
- Nuclear 0610
- Optics 0752
- Radiation 0756
- Solid State 0611

Statistics 0463

Applied Sciences
Applied Mechanics 0346
Computer Science 0984
Engineering
- General 0537
- Aerospace 0538
- Agricultural 0539
- Automotive 0540
- Biomedical 0541
- Chemical 0542
- Civil 0543
- Electronics and Electrical 0544
- Heat and Thermodynamics 0348
- Hydraulic 0545
- Industrial 0546
- Marine 0547
- Materials Science 0794
- Mechanical 0548
- Metallurgy 0743
- Mining 0551
- Nuclear 0552
- Packaging 0549
- Petroleum 0765
- Sanitary and Municipal 0554
- System Science 0790

Geotechnology 0428
Operations Research 0796
Plastics Technology 0795
Textile Technology 0994

PSYCHOLOGY
General 0621
Behavioral 0384
Clinical 0622
Developmental 0620
Experimental 0623
Industrial 0624
Personality 0625
Physiological 0989
Psychobiology 0349
Psychometrics 0632
Social 0451

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ABSTRACT

Previous research has indicated that there may be an association between alcohol abuse and the occurrence of panic attacks for many individuals. The purpose of the present investigation was to gain a greater understanding of the role of anxiety in alcohol abuse. A comparative analysis of alcoholics who reported experiencing panic attacks versus non-panic alcoholics was conducted. Of primary interest in our investigation was the study the attentional processes. Comparisons between groups of alcoholics were made on a modified Stroop word task which was designed to evaluate an individuals attention to selected stimulus words. Findings showed that alcoholics who met the criteria for DSM-III-R Panic Disorder scored higher on measures associated with alcohol abuse (Michigan Alcohol Screening Test) and generally had higher Stroop interference scores for alcohol and social threat words, than non-panic alcoholics. It is suggested that these higher interference scores are an indication that Panic Disorder alcoholics selectively process environmental stimuli associated with alcohol and self-esteem (i.e. social threat) to a greater extent than non-panic alcoholics.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Alcohol abuse continues to be an enduring societal problem despite the extensive network of treatment and educational resources employed to address this problem. In Ontario alone approximately 700,000 (or 10%) of the total population consume alcohol on a daily basis (Addiction Research Foundation, 1990). A substantial proportion of those drinkers (approximately 22,515 or 3%) were so seriously affected that professional treatment and/or hospitalization was required. Unfortunately, the trend towards alcohol and drug abuse is a threat of increasing proportion, especially for young adults under 25 years of age (Reich, Cloniger, VanEedewegh, Rice, & Mullaney, 1988). For those who have received treatment for their addiction, the chances of long-term abstinence are not promising. Longitudinal research has indicated that the recovery rate may be as low as 7% when recovery is defined as being sober for five years or more (Emerick & Hansen, 1983; Polich, Armor, & Braiker, 1981).

Recently there has been increased criticism by alcohol treatment professionals (e.g., Emerick & Hansen, 1983; Vaillant, 1983) that addiction treatment programs are not designed to effectively meet the diverse needs of the clients currently enrolled in these programs. Those

entering treatment programs today are very often multi-substance abusers (Kern, Hassett, Cohen, Lennon, & Schmelter, 1983), with a greater than average likelihood of having had a history of physical and/or sexual abuse (Brown, & Anderson, 1991; Kroll, Stock, & James, 1985). Alcoholics are also reported to have a high probability of a coexisting psychiatric disorder, in addition to their substance abuse problems (Ross, Glaser, Germanson, 1988). For example, in one large scale study, Helzer and Pryzbreck (1988) found that from the 18,000 people they assessed, those diagnosed as alcoholics were reportedly almost twice as likely as non-alcoholics to have a coexisting psychiatric disorder. The most prevalent disorders were antisocial personality disorders, affective disorders such as depression, and anxiety related disorders such as panic disorder. The reportedly high incidence of both panic attacks and substance abuse is of primary interest to the proposed investigation.

Over the past few decades numerous studies have supported the notion that there may be an association between panic disorder and alcoholism for many individuals. Evidence for this suggestion is available from a number of previous investigations. For example, early research conducted by Woodruff, Guze, and Clayton (1972) reported that, of the 62 patients in their study who met criteria for anxiety neurosis, 14.5% also met criteria for a diagnosis of

alcoholism. Similar findings were reported by Quinkin, Rifkin, Kaplan, and Klein (1972) in which these researchers found that a large proportion of their sample of diagnosed phobic patients (with panic attacks) also reported abusing alcohol (30%) and/or other drugs (60%). In a more recent investigation conducted by Bibb and Chambless (1986), 254 diagnosed agoraphobics were screened for a history of alcohol abuse. All subjects met DSM-III criteria for agoraphobia with panic attacks. Based on self-report measures of the Michigan Alcohol Screening Test (MAST), 10 to 20% of the agoraphobic subjects also met the criteria for alcoholism (based upon the selected MAST cutoff score of 5).

Conversely, researchers studying alcoholic populations have reported high rates of anxiety related disorders (e.g, panic disorder) within the samples they have investigated. For example, of the 102 alcoholic patients Mullaney and Trippett (1979) studied, 32% showed clinical symptoms of agoraphobia and/or social phobia. They also reported that an additional 36% of the alcoholics they tested had less disabling anxiety symptoms of the same types. More than half of the phobic alcoholics reported that their anxiety had preceded their alcohol abuse. The occurrence of these anxiety and panic related disorders within alcoholic populations is of particular concern because of the potential effects anxiety may be having on the precipitation, maintenance, and recovery from alcohol abuse.

Possibly alcoholics who experience anxiety and panic may resort to self-medication with alcohol and various other drugs as a primary means of coping with their panic/anxiety problem. For example, Cox, Norton, Dorward, and Ferguson (1989) found that 62.5% of the 144 alcoholics they surveyed reported experiencing at least one panic attack in the past year. In this same study, eighty-three percent of the alcoholic panickers reported using alcohol as a means of self-medicating their attacks, with 76% of these alcoholics believing this to be an effective strategy. Although there is no clear consensus regarding the precise reasons for self-medication, some researchers (e.g., Beck & Scott, 1988) have suggested that panic disorder patients have an increased sympathetic nervous system tone which results in a tendency to respond excessively to even moderate stimuli. It is suggested (Sher, 1987) that the neurochemical effects that result from alcohol consumption create a depressant effect that reduces cardiovascular functioning and overall adrenalin responsiveness through attenuation of sympathetic nervous system activity. As a result, individuals experiencing panic and anxiety states may feel as though they are able to regulate their condition through the use of alcohol (Norton, Malan, Cairns, Wozney, & Broughton, 1989).

Another finding of interest in the Cox, et al. (1989) study was the discovery that over 40% of the alcoholic panickers in their sample reported experiencing their first

panic attack prior to becoming heavy drinkers. Further analysis by Cox, et al. (1989) revealed some apparent differences in the panic attack symptomatology between those alcoholics who reported experiencing panic prior to the onset of alcoholism (pre-alcoholic panickers; PRP) and those alcoholics who reported experiencing panic attacks subsequent to alcohol abuse (post-alcoholic panickers; POP). Based upon their findings, Cox et al. (1989) suggested that there may be two types of self-medicating panickers.

Additional research in this area suggests that alcohol abuse accompanied by panic attacks may be indicative of a more severe variant of alcoholism. For example, Norton, Malan, Cairns, Wozney, & Broughton (1989) screened 102 male alcoholics for the incidence of panic attacks. Approximately 50% of the alcoholics they surveyed reported experiencing one or more attacks in the past year, with 28% meeting the DSM-III criteria for panic disorder. Of the 29 subjects who met the criteria for panic disorder, 13 (45%) reported experiencing panic attacks prior to alcohol abuse (pre-alcoholic panickers; PRP) and 16 (55%) reported having their panic attacks subsequent to the onset of heavy drinking (post-alcoholic panickers; POP). Fifty-one subjects reported never experiencing a panic attack (non-panic alcoholics; NP). Comparisons made between these three groups indicated that panicking alcoholics, especially PRP had a significantly more serious alcoholic problem. PRP

scores or measures of drinking restraint (preoccupation with thoughts of control over drinking) and situational drinking (especially in response to social drinking situations and negative emotional states) were significantly higher than those of the non-panic group. In addition, PRP subjects had the highest levels of alcoholic recidivism even though they had been drinking heavily for a shorter period of time than either of the other two groups (POP, NP). Differences were also found between pre and post-alcoholic panickers on many of the measures associated with their panic severity and symptomatology. More recently, research conducted by Malan, Norton, and Cox (1992) has also found distinct alcohol and panic symptom differences between alcoholics who meet the criteria for DSM-III-R panic disorder (DSM) and those who do not meet the criteria for this disorder (NON-DSM). These findings further support the notion that there may be different types of alcoholics even within the general category of alcoholic panickers.

Other researchers have discovered additional differences between panic and non-panic alcoholics. For example, Norton, Block, and Malan (1991) assessed the incidence of panic attacks in a sample of 100 male alcoholics. Fifty-three percent reported experiencing one or more attacks in the previous year. Comparisons of symptoms based on the 90 item Symptom Checklist (Derogatis, Lipman, & Covi, 1973) revealed that the alcoholics who

experienced panic attacks had significantly higher scores than non-panickers on scales of depression, obsessive-compulsiveness, somatization, interpersonal sensitivity, anxiety, and psychoticism.

Overall, two important conclusions can be drawn from the literature presented thus far. One is that alcohol seems to have extremely reinforcing qualities for those individuals experiencing anxiety and panic. Secondly, given these reinforcing qualities, alcohol use is likely to be a primary means of coping for many individuals with panic and anxiety problems. Based upon these assertions it is therefore reasonable to assume that alcoholics who experience panic attacks may be especially preoccupied with thoughts of alcohol consumption. This suggestion is consistent with the findings of Norton et al. (1989) in which they reported that those alcoholic clients with the most severe anxiety symptoms drank heavily in the greatest number of situations and scored highest on alcohol preoccupation measures. Recently alcoholism research has suggested that environmental cues may be instrumental in provoking thoughts of alcohol use (Kadden, Pomerleau, & Meyer, 1984). Other researchers such as Vaillant, & Milofsky (1982) have suggested that dysphoric mood states often precede and may be a precipitant of alcohol use for many individuals. Based upon this information it is suggested that anxiety may have a similar precipitating

effect, in that the environmental, physiological, and emotional feelings associated with anxiety and/or panic may be instrumental in initiating thoughts related to alcohol consumption.

Cognitive Research

There has been very little research which investigates the cognitive processes of alcoholics, and the study of attentional processes are no exception. Recently several researchers (e.g., Hope, Rapee, Heimberg, & Dombeck, 1990) investigating the cognitive processes (more specifically attentional processes) of anxiety disorder patients have had some success through using modified versions of the Stroop Word Test (Stroop, 1938).

The original Stroop Word Test (Stroop, 1938) is a color-naming task that was designed to measure response latencies. Simply put, a latency is the amount of time it takes a person to respond to a stimulus. The original Stroop task involved presenting subjects with a number of different words (one at a time) which were printed in a variety of ink colors. The subjects' task was to name the "color" of the word as quickly as possible, while ignoring the meaning of the word. Stroop (1938) found that subjects' response times were much longer when the word-color stimulus was "inconsistent" as opposed to when the word-color stimulus was "consistent." For example, if a printed word

says "yellow" and the actual ink color of that word is the color "red" (inconsistent), it generally takes a person longer to give a response to the color than if the word and the color are the "same" (consistent). Although the mechanisms responsible for this effect have not been established, it has been suggested (MacLeod, 1991) that each word stimulus presented is interpreted or processed as discrete components of information. It is when these various components of stimulus information interact that an interference effect is created. For example, one component of the stimulus might be the "color" of the word, while another component might be the "shape" of the stimulus (e.g., the letters), a third component might be the "meaning" or linguistic aspect of the word. Klein (1964) was one of the earliest researchers to study the "meaningfulness" of words as a stimulus component. In his initial studies, Klein (1964) found that if the words presented to the subject were in some way associated with the color (e.g., if the color of the word is "yellow" and the word says "banana") the color-naming latencies were longer than if the words were unrelated to the color (e.g., neutral word such as "take"). Klein (1964) suggested that certain words that have meaning for us have the capacity to produce arousal, which in turn results in what Klein refers to as attention-catching or attensive power. Klein (1964) proposes that the greater this attensive power, the more

interference a word exerts on the color-naming task. More recently, research (e.g., Watts, McKenna, Sharrock, & Trezise, 1985) has indicated that the speed of color-naming of emotionally salient words may be an indication of an individual's preoccupations, anxiety, or mood state. For example, Ray (1974) found that students in a pre-examination period had greater color-naming latencies when they were presented with words related to examination anxiety than when they were presented with neutral words. In research conducted by Watts, et al. (1985) it was reported that spider phobics had significantly greater interference scores on the Stroop task when presented with spider words than when the words were neutral. More recently, researchers have used the Stroop color-naming task to investigate the cognitive processing of anxiety patients. Several investigators (e.g., Mogg, Mathews, & Weinman, 1989; Hope, Rapee, Heimberg, & Dombeck, 1990; McNally, Riemann, & Kim, 1990) have found that anxiety and panic disorder patients tend to have longer color response latencies when the words they are presented with are associated physical and social threats than when the words are neutral in their meaning.

Several explanations have been posited to account for the Stroop phenomenon. For example, according to the perceptual encoding hypothesis (Hock & Egeth, 1970) the "encoding" stage of information processing is the locus of word-color interference. It is suggested that during the

encoding process there is a division of attention between various stimulus components (e.g., the color, the meaning, the shape). As a result of a limitation in our perceptual resources, (if the designated task is to name the color of the word) information processing of the irrelevant or non-task related components of the stimulus (e.g., word meaning) may interfere with the processing of the task related component of the stimulus (e.g., color naming).

According to the response-competition hypothesis (Dyer, 1973; Klein, 1964) information from the stimulus components of "color" and "meaning" are both processed separately and are in competition for a single motor-output channel. However, since words can be read faster than the colors can be named (Posner & Snyder, 1975) when attempting to make a color-naming response, an individual must expend effort to clear the channel by suppressing his response to the meaning of the word. This process is assumed to result in a greater response latency time. According to this model the interference is suggested to occur during the response generation stage of information processing.

More recent interpretations of the Stroop phenomenon have emphasized parallel processing models (Logan, 1980; Cohen, Dunbar, & McClelland, 1990). Unlike previous models discussed in which the dimensions of a stimulus are processed in a sequential fashion, the parallel processing models suggest that different dimensions of a stimulus can

be processed simultaneously. According to this type of model each dimension of a stimulus has a certain strength or weight, and those dimensions of a stimulus that have a greater weight (e.g., a word with emotional valence) are likely to interfere with the processing of another dimension that has less weight or intensity (e.g., color-naming). This theory would seem to explain the differential interference effect that various words seem to have.

Although each of these theories is different in their explanation of the Stroop effect, they all seem to agree that there is an interference effect in which one dimension of the word stimulus (e.g., meaning) somehow creates a delay in the processing of another stimulus dimension (e.g., color-naming). At present there does not appear to be a consensus within the scientific community as to the validity of any one of the theories discussed thus far.

Recently several researchers (e.g., Mogg, Mathews, & Weinman, 1989) have explored the attention and memory processes of clinically anxious and/or panic disorder patients. Findings from a number of studies indicate that these patients exhibit a memory bias for threat and anxiety related information when performing verbal recall tasks (McNally, Foa, & Donnell, 1989). In addition to the possibility of a memory bias, research indicates that people with panic disorder also show evidence of having an attention bias for the same threat and anxiety information.

In a study conducted by Mogg, Mathews, & Weinman (1989) 18 patients meeting the ICD-9 criteria for anxiety disorder were compared with a similar number of control subjects on measures designed to assess selective attention. Mogg et al. (1989) presented anxiety and control subjects with various word cues using a modified version of the Stroop Word paradigm. Results showed that anxiety patients had higher interference effects for threat words (e.g., disease, mutilated) and social threat words (e.g., failure, inadequate) than controls. Based on interference scores, which are assumed to be the result of selective processing mechanisms, Mogg et al. (1989) suggested that the response latencies to the threat cues are a reflection of the predominant concerns of anxiety patients. Similar results were reported by McNally, Riemann, & Kim (1990) who compared 14 panic disorder patients with 14 normal controls on measures of Stroop interference. Their results indicated that, compared to controls, the panic disorder group had a greater degree of Stroop interference for threat words, suggesting there may be a greater attention bias for threat related stimuli. Much like other researchers in this area, McNally et al. (1990) concluded that panic patients selectively process environmental cues (e.g., threats) that are consistent with their predominant worries or concerns. The findings of Hope, Rapee, Heimberg, and Dombeck (1990) are also consonant with this suggestion, in that the social

phobics they tested showed longer color-naming latencies for social threat words and the panic disorder patients tested had longer latencies for physical threat words.

To explain the particular mechanisms responsible, Beck, Emery, and Greenberg (1985) have suggested that panic and anxiety patients are characterized by an overactive cognitive schema that has the primary function of detecting potentially threatening stimuli in the environment (e.g., attentional scanning for threat cues). If correct, this suggestion would explain the apparent attentional bias for threatening stimuli by anxiety patients.

If the proposition that an individual's schema guides attentional processes is correct, it is feasible that any domain of concern that an individual has should be detectable as an attentional bias. Several investigators share this premise (e.g., Foa, 1989, Watts, McKenna, Sharrock, & Trezise, 1986) and have found evidence to suggest that an individual's particular attentional biases are generally consistent with their cognitive concerns (e.g., rape fears, social phobia, etc.). Given the evidence presented thus far it would seem to be theoretically probable that an individual's preoccupational concerns with alcohol use should be evidenced by a greater attentional bias for alcohol related stimuli. It might also be expected that alcoholics who are most preoccupied with alcohol use, will obtain the highest interference scores on the Stroop

measures associated with alcohol abuse. The present investigation will test this hypothesis.

Theoretical Basis for the Proposed Research

The literature presented thus far was advanced primarily to acquaint the reader with some of the etiological and theoretical perspectives currently of interest in the area of anxiety/alcoholism research. The proposed investigation will involve studying the cognitive processes of alcoholics. The intent of the present study will be to investigate the attentional processes of alcoholics who experience panic attacks versus those alcoholics who do not. It is suggested that, if individuals experiencing panic attacks in other investigations (e.g., Hope, et al., 1990; McNally, et al., 1990) have attentional biases for environmental information associated with their condition, so too should alcoholic clients experiencing panic attacks in the present investigation. Based upon the findings from previous research (e.g., Norton et al., 1989) it is suggested that alcoholics who experience panic are more likely to be preoccupied with panic related concerns than non-panic alcoholics. Research from this same study also seems to indicate that alcoholic panickers have a greater number of thoughts related to alcohol use. It is therefore suggested that, alcoholics who experience panic should have greater attentional biases for environmental

information which is associated with panic attacks and alcohol use than non-panic alcoholics. In addition, if it is found that alcoholics who experience panic have greater attentional biases for alcohol related information (and possibly a more serious alcoholic condition) than non-panic alcoholics, then it should also follow that these panicking alcoholics should score higher on other measures of alcohol abuse (e.g., Michigan Alcohol Screening Test; MAST). Based upon this premise it might also be expected that Stroop interference measures for alcohol related words and subject scores on the MAST should obtain a high positive correlation.

Our study will also investigate the use of drugs, other than alcohol. Research has indicated that large numbers of alcoholics entering treatment report having poly substance abuse problems (e.g., Kern, Hassett, Cohen, Lennon, & Schmelter, 1983), with some studies suggesting that alcoholics who experience panic attacks in particular report the highest levels of poly abuse (Norton et al., 1990; Malan et al., 1992).

Objectives and Rationale for the Proposed Research

With respect to the proposed investigation, the first objective will be to identify alcoholics who experience panic attacks from those alcoholics who do not experience such attacks. Given the differences found between groups of

alcoholics in previous investigations (e.g., Malan et al., 1992), it is the purpose of this study to explore some of the cognitive processes that might differentiate these groups.

Once groups are established the second objective of this investigation is to evaluate whether alcoholics who experience panic attacks selectively process environmental cues associated with physical threats, social threats, and alcohol to a greater extent than non-panic alcoholics. The rationale for this line of inquiry is that, if alcoholic panickers are experiencing a similar anxiety state as those with clinical panic disorder (e.g., Hope et al., 1990; Mogg et al., 1989; McNally et al., 1990) then there should be a greater degree of attentional bias for physical threat cues by alcoholic panickers than there would be for non-panic alcoholics. This assumption is based upon the idea that the dominant concerns of both alcoholic and non-alcoholic panickers are similar (e.g., physical threats from the environment) and that these concerns will not be as prevalent for non-panicking individuals. This effect may be especially evident in the context of treatment. It is suggested that, because alcoholic panickers in treatment are no longer able to use alcohol as an effective means of coping with their attacks, they may experience an escalation in the number and intensity of panic attacks experienced. Hypothetically, these circumstances would be likely to

increase an individual's preoccupational thoughts concerning both panic attacks and alcohol use.

Previous information also indicates that the social pressures associated with drinking were extremely potent precipitants for future abuse by alcoholic panickers (Norton et al., 1989). It is therefore reasonable to assume that alcoholic panickers might have an attentional bias for social threat cues, similar to the biases anxiety disorder patients seemed to indicate in the Hope et al. (1990) study. Neutral cues should show a similar pattern of Stroop interference for all subjects.

Based upon previous findings (Norton et al., 1989) which seem to indicate that alcoholic panickers (especially PRP) have a more severe alcoholic condition (e.g., significantly higher alcohol restraint scores), it is suggested that alcoholic panickers will show a greater attentional bias for alcohol related cues (e.g., alcohol word latencies) than non-panic alcoholics.

The third objective is to conduct comparisons between Stroop interference scores for alcohol words and scores on the Michigan Alcohol Screening Test (MAST). It is assumed that if Stroop interference for alcohol related words is in some way an index of the severity of an individual's alcoholic condition (e.g., preoccupation with thoughts of alcohol), then an association should be found between the latencies recorded for alcohol words and other measures of

alcoholism such as an individual's score on the MAST. The MAST is designed to assess alcoholism based upon self-report behaviors and experiences that are assumed to be associated with an alcoholic lifestyle.

The final objective will be to assess differences between alcoholic panickers on measures associated with their use of drugs other than alcohol. Previous research has indicated that these groups differ on their use of drugs (Norton et al., 1990; Malan et al., 1992), with the DSM group generally scoring highest on the majority of these measures.

Hypothesis

1) Alcoholic panickers (especially those who meet the DSM-III- R criteria for Panic Disorder) will have higher interference scores than non-panicking alcoholics for words related to physical threat, social threat, and alcohol use.

2) The neutral words for each category of words (e.g., alcohol, physical threat, and social threat) will have shorter latencies than the experimental words for that same category of words.

3) Individuals who obtain high Stroop interference scores for alcohol words will also obtain high scores on the MAST.

CHAPTER II

METHOD

Subjects

Subjects were 81 clients (65 males, 16 females) from the Brentwood Treatment Home for Alcoholics located in Windsor, Ontario. Ages ranged from 18 to 54 years of age. Only the data from 74 subjects was used in the analysis. One individual's data was removed because of excessive errors when performing the color-naming task. A second person's data was not used because she failed to return her questionnaire package (MAST, DAST, and APQ). Five others were not used because they failed to meet the minimum criteria for alcoholism (score of 5 or greater) on the Michigan Alcohol Screening Test (MAST). Informed written consent was obtained from all subjects taking part in the study and participation was on a voluntary basis. All testing was conducted within the treatment facility by the primary investigator.

Measures

The Michigan Alcohol Screening Test (MAST; Selzer, 1971)

The MAST is a 24 item self-report inventory designed to detect a possible alcoholic condition. Selzer (1971) suggests that alcoholics can be identified by certain behavioral and experiential characteristics that are generally associated with their condition (e.g., job loss as

the result of drinking, drinking before noon, unable to stop drinking despite an effort to do so). Based upon a preliminary screening test of a group of alcoholics and a review of the pertinent research in the area of alcoholism (Mulford & Wilson, 1966; Waller, 1967), Selzer (1971) developed a number of questionnaire items that were believed to be associated with an alcoholic's life experiences. The questionnaire Selzer (1971) developed and tested is very straightforward to administer. The MAST involves simply asking the respondent to answer "yes" or "no" to each of the experiences surveyed by the items presented (see Appendix A). It should be noted that Selzer (1971) developed a MAST scoring scheme in which each item is assigned a point value ranging from 0 to 5. Higher point values are assigned to those items which are assumed to be associated with a more severe alcoholic condition. The maximum MAST score is 53. The initial study to evaluate the psychometric properties of the MAST was conducted by Selzer (1971) and involved administering the MAST to five separate subject groups. The groups included; hospitalized alcoholics (n=116), drunken drivers (n=99), individuals who had been convicted of drunk and disorderly conduct (n=110), individuals whose drivers licences were under review for traffic violations (n=98), and finally a control group consisting of a number of randomly selected University of Michigan employees and individuals visiting the university's allergy clinic

(n=103). In terms of the validity of the MAST, results indicated that when a cutpoint of 5 is used, the MAST identified 98% of hospitalized alcoholics, 55% of drunken drivers, 59% of drunk and disorderly, 11% of the licence review, and only 5% of the control group as having a possible alcoholic problem. These findings are somewhat consistent with the percentages of subjects in each group for whom Selzer (1971) was able to obtain records of previous alcohol abuse. The proportion of those subjects found to have records for alcohol abuse were; 25% of the drunken drivers, 40% of drunk and disorderly group, 11% of the licence review group, 1% of the control group, with of course 100% of hospitalized alcoholics. These figures would appear to support the validity of the MAST, especially given the difficulty generally associated with obtaining confessions of abuse from individuals not in treatment. Additional analysis comparing the records for previous abuse with MAST scores, showed the MAST to obtain 15 false negatives. This information would seem to suggest that, as a measure of alcoholism the MAST has a tendency to under rather than over-pathologize clients.

Subsequent research supports the findings of Selzer (1971). For example, Mischke and Venneri (1987) reported that the MAST successfully identified 85% of alcoholics with significant drinking problems, as defined by a group of trained alcoholism counsellors. With respect to construct

validity, a number of studies (e.g., Ross, Gavin, & Skinner, 1989; Breitenbucher, 1976) have reported high correlations between scores on the MAST and other measures of alcohol abuse; included are such measures as the Alcohol Dependence Scale (r =.79), the DIS diagnostic system (r =.65), and the MacAndrew alcoholism scale (.65).

Reliability estimates reported by Skinner and Sheu (1982) indicate that, based upon a 5 month interval, the MAST has a test-retest reliability of approximately .84. Estimates of internal-consistency reliability (coefficient alpha) for the MAST from the initial assessment and at retest were .85 and .88, respectively. Mischke and Venneri (1987) reported similar reliability estimates of the internal-consistency of the MAST, with a coefficient of .84.

The Drug Abuse Screening Test (DAST; Skinner, 1982)

The DAST is a 28 item self-report instrument designed to evaluate the subject's perception of a drug abuse problem, dependence symptoms, and the various consequences related to drug abuse (see Appendix B). Subjects are required to respond by indicating either "yes" or "no" for each of the questions. The DAST total score is computed by summing all the items that are endorsed in the direction of increased drug problems. Thus, the total score can range from 0 to 28, which yields a quantitative index of the

severity of problems related to drug misuse. A cut-off score of six or greater on the DAST has been the suggested score necessary to identify clinical drug abuse problems (Skinner, 1982).

An evaluation of the psychometric properties of the DAST using a clinical sample of 256 drug and alcohol clients (Skinner, 1982) indicated a high degree of internal consistency reliability (coefficient alpha=.92). In subsequent investigations, reliability estimates of internal consistency ranged from .94 in a sample (n=223) of alcohol and drug abusers, to .84 in a sample (n=86) of drug abusers only (Skinner & Goldberg, 1986). With respect to the diagnostic validity of the DAST, research (Gavin, Ross, & Skinner, 1989) has indicated that the DAST has an overall diagnostic accuracy of 85% in identifying patients (n=501) with a DSM-III Substance Abuse disorder. High sensitivity, high specificity, and overall accuracy rates above 78% were maintained when DAST cutoff thresholds ranged from 5/6 to 9/10. Similar findings were reported in subsequent research (Staley & El-Guebaly, 1990) in which the DAST obtained an overall accuracy rate of 89% in identifying patients with a DSM III-R substance abuse problem. An overall accuracy rate above 85% was found when using DAST cutoff thresholds of 5/6 to 10/11.

Anxiety and Panic Questionnaire (APQ; Telch, Lucas, & Nelson, 1989).

The APQ is a 15 item instrument designed primarily to assess the incidence of panic attacks and/or panic disorder as defined by DSM III-R (see Appendix C). The first section of this questionnaire includes items designed to obtain descriptive information such as age, sex, education, employment, and marital status. The introductory paragraph describes a typical panic attack and instructs the participant to answer designated questions if they have experienced these attacks. The initial panic screening item "Have you ever felt a sudden rush of intense fear or anxiety or feeling of impending doom?" was derived directly from the Structured Clinical Interview for the DSM III-R (SCID; Spitzer, Williams, & Gibbon, 1987). For most items, subjects are required to respond to questions according to either a fixed choice, scaled, or a 5 point Likert-type rating system. Subjects are instructed to provide information as to whether attacks were limited to a) stressful situations, b) when they were the focus of others, c) when taking drugs, and d) when physically ill. Other questions ask if attacks ever occurred "out of the blue", at what age panic attacks began, rating the severity of their worst attack, situations in which panic attacks had occurred, if they had ever experienced four or more attacks within a four-week period, if they had ever had a period

lasting at least one month when they worried a lot about having another attack, rate how much they have worried about having an panic attack during the past month, rate how much fear they would experience if they thought they would have an attack tomorrow, how many attacks they experienced during the past 30 days and six months, rate how much panic attacks have interfered with their lives during the past month, indicate situations and/or activities they have avoided as the result of panic, methods used to cope with their panic attacks, the effectiveness of the method that worked best, and finally whether their attacks began prior to heavy drinking. Additional questions on the APQ are designed to assess use of alcohol or other drugs. These questions include the following a) whether the patient has ever sought treatment for alcohol abuse in the past, b) approximately when drinking began, c) approximately what age drinking became a more serious problem, d) use of other drugs prior to alcohol abuse, and e) use of drugs other than alcohol after alcohol abuse began.

Through information obtainable from the APQ, alcoholics classified with having panic disorder were identified according to the DSM-III-R criteria of experiencing at least four panic attacks in the past four weeks, at least one of those attacks occurring spontaneously, and a minimum of four of the symptoms assumed to be associated with panic attacks

(a minimum rating of severe is required for each symptom to qualify).

Individuals who report "no panic attacks" were only be required to fill out the first part of the APQ, which elicits demographic and descriptive information (e.g., age, sex, employment) and the final portion of the APQ which covers alcohol treatment and drinking history.

The APQ requires approximately 15 minutes to complete. In an evaluation of test-retest reliability of the APQ (3-week interval), Telch et al. (1989) report the Kappa coefficients for each of the dichotomous items to range from .61 to 1.0.

The accuracy of the APQ in correctly classifying individuals with a panic disorder was assessed by Telch et al. (1989). Both the APQ and the Structured Clinical Interview (SCID; Spitzer et al., 1987) were administered to 22 subjects who had reported experiencing at least one panic episode. The interviewer was unaware of the subjects' responses to the APQ. Based upon statistical comparisons of the information obtained from the SCID and the APQ, Telch et al. (1989) reported that agreement on the presence or absence of panic disorder obtained a Kappa coefficient of .79. In addition, Telch et al. (1989) also reported the APQ to yield a false positive rate of 9% (n=2), with no false negatives.

Stroop Word Test -modified version (SWT; Hope, 1989).

The present investigation used a modified version of the Stroop word test developed by Hope (1989). This investigation involved tachistoscopically presenting different words which were printed in a variety of colors and displayed on a computer screen.

The tachistoscopic word presentations were grouped categorically based on a common theme or meaning (Hope, 1989). Thus, subjects were presented with a group of words which were members of a selected category (e.g., threat words). Each category consists of five words which were presented in a random order. In total, each color-word presentation **(see Appendices D though J for copies of word presentations)** consisted of 99 words (11 rows at 9 words per row) which were presented on one computer screen. The words were presented on a 9" X 7" color monitor. Each word stimulus was presented in one of five colors (red, yellow, blue, green, or white). The color that any particular word was presented in was determined randomly by the computer. When subjects indicated they were ready, they were presented with one category of words at a time and were expected to name the "color" of each word out loud. Subjects were expected to read each color starting from the top left hand corner of the page and were to read the words from left to right, row by row until the end of the page. The timer was started when the subject named the first color and the timer

was stopped when the last color was named. The amount of time the subject took to name all the words for a given category of words was referred to as the latency time. Another type of Stroop word score used in the analysis was the word interference score. Interference scores were obtained by subtracting the control word latency times from the experimental word latency times for each category of words.

The modified version of the Stroop Word Test used in the current investigation involved presenting each subject with seven categories of words which included the following: practice words, physical threat words, physical control words, social threat words, social control words, alcohol words, and alcohol control words (words selected for each category are presented in the procedure section).

Subjects were first presented with a number of practice words (see **Appendix D**). The words in this category were presumed to be neutral and the object of this presentation was to give subjects the opportunity to familiarize themselves with the task that was expected of them. The social threat, physical threat and alcohol words were selected to approximate the preoccupational concerns of individuals with a specific disorder. According to Hope, et al. (1990) the social threat words were selected to be representative of the self-schemata of social phobics in social situations. For example, some words were selected

because of their potential to evoke self-descriptive constructs (e.g., inferior). Other words were selected because they were suggested to describe the social phobics' expectations for their performance in social interactions (e.g., failure). The physical threat words were chosen to reflect the self-schemata of panic disorder subjects as proposed by Beck, Emery, and Greenberg (1985). As discussed earlier, Beck et al. (1985) suggest that individuals who suffer from frequent episodes of panic often seem to be hypersensitive to danger or threat cues within their environment. The category of alcohol words included in the present investigation were selected to represent some of the preoccupational thoughts of alcohol that many of the alcoholics presently undergoing treatment might be experiencing. The control words selected for each category were not assumed to be associated with any preoccupational concerns and were therefore presumed to have much less of an interference effect. Response latencies to the control words were used as baseline measures from which the response times for other word categories (e.g., threat words) were subtracted to obtain the interference score for each category. In an effort to maintain consistency across word groups, control words were matched with threat words according to the number of letters, the number of syllables, and frequency of occurrence in the English language (Caroll, Davies, & Richman, 1971).

In addition to the color-word presentations, each subject was also required to provide information related to their emotional status (e.g., How anxious do you feel right now?) prior to being presented with the word-color stimuli. The assessment of emotional status involved obtaining subject's ratings of their current level of anger, anxiety, and happiness based on an 8-point Likert type scale (see Appendix K). Emotional status responses were recorded by the computer. It should be noted that, while the anxiety rating is relevant to the present investigation, the anger and happiness ratings were only included to defuse the possible schema priming effect of self-rating anxiety.

With respect to the psychometric properties of this particular version of the Stroop Word Test (Hope et al., 1989), very few investigations have been conducted. However, in a study conducted by Jensen (1965), one of the modified versions of the Stroop Word Test he used was very similar to the one employed by Hope et al. (1989). Jensen (1965) presented subjects with plates consisting of twenty rows and five columns of "color" words printed in various colors, whereas Hope et al. (1989) on the other hand presented subjects with cards consisting of eleven rows and nine columns of words. Based upon the composite correlation of ten repeated administrations of this version of the Stroop Test, Jensen (1965) reported a test-retest coefficient of .84. Interestingly, Jensen (1965) found no

significant differences in the reliability estimates when test-retest intervals were two to three minutes, one day, or one week. These findings are consistent with the reliability information obtained on the original Stroop Word Test (Stroop, 1938). For example, Santos and Montgomery (1962) reported that over a number of test-retest trials (ten minute interval) of the Stroop color-word test, correlations were found to be between .78 and .93. Likewise, Gardner and Long (1960) also obtained high test-retest reliability estimates (r =.75) for color-word performance with an interval of three years between tests. These results are consistent with the findings reported by many other investigators in the area (e.g., Evans, 1985; Hynd, 1985). For example, even when Stroop words are presented in another language such as Japanese (Uechi, 1972), test-retest (one year interval) reliability coefficients are found to range from .60 to .89.

Procedure

Step 1.

Subjects were initially presented with a consent form which informed them concerning the nature of the study and what would be expected of them (see **Appendix L**). It was emphasized that participation in the study was of a voluntary nature and that non-participation would in no way effect their treatment.

Step 2.

Once informed consent was obtained the MAST, DAST, and APQ were administered to all subjects. The MAST and DAST took approximately 5 minutes each to complete. The APQ and SWT required between 15 to 20 minutes to complete. Subjects who reported never experiencing a panic attack, were instructed to fill out only the portions of the APQ questionnaire pertaining to demographic information, previous treatment for alcohol abuse, and drug history. Each subject was assigned a code number for later statistical analysis of the APQ, MAST, DAST, and SWT.

Step 3.

Following administration of the questionnaires, participants were directed to a sound attenuated room where they were individually administered the modified Stroop Word Test. Once the subjects were seated in front of a computer with a color monitor, the following instructions were presented;

> "I am going to be showing you a number of words on a computer screen and I will ask you to name the colors of these words. As you may have read on the consent form, the reason we are doing this study is to better understand how people respond to their surroundings or

environment. In this study we are interested in how people respond to different words. Do you have any questions?"

At this point each subject was asked to perform a brief color blindness task, in addition to a brief word reading test (obtained from the Wide Range Achievement Test; Jastak Associates, 1984). The above tasks screened the participants for color blindness, and a minimum grade seven reading ability, respectively. Two subjects failed to meet the minimum of grade seven reading ability for this study and two subjects were found to be color blind. Data was not obtained from those subjects who failed to pass the screening tests.

Following these brief screening procedures the computer screen was turned on. The computer provided written instructions (see **Appendix M**) which the researcher read to each subject in an effort to facilitate an understanding of the task. The instructions basically informed the subjects that they would be required to name aloud the colors of the ink of the words presented on the screen. Specifically, each subject was told:

"I'm going to ask you to name out loud the color of the words you see on the screen, one at a time. You will start at the upper left hand corner, over here (experimenter pointed to area) and name the color of

each word, one at a time. The computer will be timing you so I want you to name the colors as quickly as possible. However you also want to make as few mistakes as possible". The subject was also told, "I will be controlling the timer so I want you to tell me when you are ready to start, and also when you are finished the task. Do you have any questions?"

Before the color-naming task began (and between presenting each category of words) subjects were asked to rate their current level of anger, anxiety, and happiness on three eight-point Likert-type scales (see Appendix K). The experimenter recorded these responses on the computer. Inquiries were also made concerning subject's comfort level and any possible visual or physical problems prior to starting the task. When a subject indicated that he/she was ready to begin, the experimenter presented the first set of words. The timer was simultaneously started when the first color name was announced and was stopped when the last color of each category was named. Each category of words was timed in the same fashion.

The first set of words presented in each instance were practice words and were included to give subjects' an opportunity to familiarize themselves with the task. There were six other categories of stimulus words presented. These included: physical threat words, physical control

words, alcohol words, alcohol control words, social threat words, and social control words. The order in which the these word groups or categories were presented was randomly selected by the computer.

Each of the stimulus words within a category was randomly presented in one of five colors (either blue, green, red, or yellow). Words included in each of the categories were:

PRACTICE WORDS - BOOK, POSITION, LEVEL, THING, HOUSE.
PHYSICAL THREAT - HOSPITAL, INSANE, FATAL, DOCTOR, ILLNESS.
PHYSICAL CONTROL - LEANING, DEFIED, RAYON, UPWARD, REPORTED.
SOCIAL THREAT - FAILURE, INFERIOR, STUPID, FOOLISH, BORING.
SOCIAL CONTROL - INSERT, OBSIDIAN, METRIC, NETWORK, PORTION.
ALCOHOL - BEER, SCOTCH, RUM, WHISKEY, WINE.
ALCOHOL CONTROL - GROUND, OIL, SITE, LIGHTEN, TURF.

Step 4.

Following the SWT the purpose of the study was explained in greater detail to each of the subjects and any questions were addressed. Subjects were told that the results would be posted at the Brentwood nursing station in approximately one month and that if they wanted an individual copy of the results or had any questions they could phone the primary investigator (names and phone numbers were printed on their copy of the consent form).

CHAPTER III

Results

In the present investigation two stages of analysis were performed. The first stage of analysis was concerned with statistical comparisons of a number of descriptive variables. The second stage of the analysis was concerned with analysis of the experimental variables.

Analyses of the data involved comparing the following clinical groups; (1) non-panic alcoholics (NON-PAN), (2) alcoholics who met the criteria for DSM-III-R Panic Disorder (DSM), and (3) alcoholics who reported experiencing panic attacks but did not meet the DSM-III-R Panic Disorder criteria (NON-DSM). As mentioned earlier the original intent of the study was to compare results derived from only panic disorder alcoholics (DSM) and non-panic alcoholics (NON-PAN). However since the numbers of alcoholics who experienced lesser attacks, (i.e., NON-DSM), was quite large, a third group was included for analysis.

Of the 74 alcoholics included in the analysis, 18.9% (n=14) met the criteria for DSM-III-R Panic Disorder (DSM), 47.2% (n=35) experienced panic attacks but did not meet the criteria for Panic Disorder (NON-DSM), and 33.7% (n=25) did not report experiencing any panic attacks (NON-PAN).

Rationale of Descriptive Data Analysis

Analysis of this descriptive data involved the application of Chisquare statistics to analyze the categorical and dichotomous variables, and the analysis of variance (ANOVA), t-tests, and correlational analysis for continuous variables. The BMDP (Statistical Software Inc., 1987) statistical package was used to analyze the data.

The categorical descriptive variables analyzed were gender, employment, education, marital status, drug use, and previous treatment. The continuous descriptive variables included age, the age drinking began, the age at which problem drinking began, scores from the MAST, scores from the DAST, and duration of panic attacks.

Rationale of Experimental Data Analysis

The second stage of the analysis was concerned with analysis of the experimental variables and statistical tests relevant to hypotheses of the present study. The two types of experimental variables examined in this section were the color-naming latency and interference scores. As described earlier, the amount of time the subject took to name all the words for a given category of words was referred to as the latency time. The interference scores were obtained by subtracting the control word latency times from the experimental word latency times for each category of words.

The first hypotheses stated that alcoholic panickers (especially DSM) would have higher interference scores than non-panicking alcoholics for words related to physical threat, social threat, and alcohol use. Analyses of the word interference scores were used to test this first hypothesis.

The second hypothesis predicted that the neutral words would have the shortest latencies for each of the word categories. Analysis of the word latency data were used to test the second hypothesis.

The third hypothesis predicted that those individuals who obtained high Stroop interference scores for alcohol words would also obtain high scores on the MAST. Correlational analysis between the alcohol interference scores and the scores from the MAST were use to test the third hypothesis.

With respect to the latency score data, a separate multivariate analysis of variance was preformed for each category of words (alcohol, physical threat, and social threat). For each category of words there was a set of experimental words and a set of control words. Analyses involved conducting latency score comparisons between word type (experimental words vs. control words) and subject group (NON-PAN, DSM, NON-DSM) for each category of words. Therefore, for each category of words (alcohol, physical threat, and social threat) a 3 X 2 design was used to

analyze the latency score data, with subject groups (NON-PAN, DSM, NON-DSM) representing three of the comparison variables and word types (experimental words vs. control words) representing the other two variables.

Analysis of the word interference data also employed the use of multivariate statistics. Interference scores are the calculated difference between the experimental word latency scores and the control word latency scores for each category of words (alcohol, physical threat, and social threat). The interference scores are derived by subtracting the control word latencies from the experimental word latencies.

A 3 X 3 multivariate analysis of variance was used to analyze the interference data, with subject groups (NON-PAN, DSM, NON-DSM) representing three of the comparison variables and word categories (alcohol, physical threat, and social threat) representing the other three independent variables.

The BMDP (Statistical Software Inc., 1987) statistical package was used to analyze the data.

Stage 1 Analysis of Categorical Descriptive Data

The first series of analyses involved conducting comparisons between the NON-PAN, DSM, and NON-DSM groups on the descriptive variables of gender, employment, education, marital status, and previous treatment. The above mentioned

descriptive information was obtained as categorical data and as such Chisquare statistics were used for the analysis.

Based upon data from the first analysis (see Table 1) it was found that 80.7% (n=62) of the total sample consisted of males. Proportionally, the DSM group had the greatest number of females with 42.9% (n=6), with the NON-PAN group having the fewest numbers of females with only 4% (n=1). These two groups were found to differ to a statistically significant degree, $X^2(1)=9.20$, $p<.002$. This finding is consistent with the reports of numerous other investigators (e.g., Kaplan & Sadock, 1988), that Panic Disorder is much more commonly reported by females than males.

Analysis of the data pertaining to employment revealed that the NON-DSM sample had the lowest levels of unemployment with 28.6% (n=8) and the DSM group reporting the highest rate of unemployment with 57.1% (n=10). However no statistically significant differences were found between the groups on this measure. Given the employment inequities that are generally experienced by females in our society, perhaps it is not surprising that the highest levels of unemployment are found in the same sample (DSM) with the highest proportion of females.

With respect to the level of education obtained, three categories were established. These included: (1) grade 9 or less, (2) grade 10 to 12 obtained, and (3) more than grade

Table 1

Chisquare Comparisons of Gender, Employment, Education, and Marital Status.

Variable	NON-PAN (n=25)	DSM (n=14)	NON-DSM (n=35)	χ^2	df	P value
Gender						
(%)females	4.0b	42.9a	14.3	10.15	2	.006
(%)males	96.0	57.1	85.7			
Employment						
(%)unempl.	33.3	57.1	28.6			
(%)employ.	66.7	42.9	71.4	3.64	2	.161
Education						
(%) grade 9 or less	24.0	21.4	20.0			
(%) gr.10-12	64.0	71.4	60.0			
(%) over 12	12.0	7.1	20.0	1.63	4	.802
Marital status						
(%) single	40.0	42.9	42.8			
(%) cohabit.	8.0	7.1	0.0			
(%) married	28.0	21.4	37.1			
(%) separated	16.0	14.3	5.7			
(%) divorced	8.0	14.3	11.4			
(%) widowed	0.0	0.0	2.8	6.73	10	.750

Note. Means with different subscripts differ significantly at $p<.05$. Chisquare comparisons were used to establish significance.

12. Results revealed that the majority of the sample (n=47) reported having completed up to at least grade 10, with approximately 14.6% (n=11) having more than grade 12% and 21.6% (n=16) with a grade 9 or less. No statistically significant differences were found between the NON-PAN, DSM, and NON-DSM groups on this measure.

The marital status variable consisted of six different categories. These included: (1) single, (2) cohabitating, (3) married, (4) separated, (5) divorced, and (6) widowed. Analysis of the information pertaining to marital status revealed that the majority of the sample was single (n=31) or married (n=23). Very few of the subjects were either widowed (n=1) or cohabitating (n=3). No statistically significant differences were found between groups on this measure.

With respect to previous treatment (see Table 2), 49.9% of the total sample (N=74)) reported they had sought treatment for alcoholism in the past. The DSM group had the highest proportion (57%) of alcoholics who had been previously treated for abuse problems and the NON-DSM group had the lowest proportion (45.7%). No statistically significant differences were found to exist between any of the groups with regard to previous treatment for alcohol abuse.

Table 2

Chisquare Comparisons Between Clinical Groups on Variables Related to Previous Treatment.

	NON-PAN (n=25)	DSM (n=14)	NON-DSM (n=35)	X^2	df	P value
Previous treatment for alcoholism (%)	50.0	57.1	45.7	0.52	2	.76
Previous treatment for panic attacks (%)		35.7	8.6	5.39	1	.02

With respect to previous treatment for panic attacks, only 14.2% of those alcoholics reporting panic (n=49) sought treatment for their attacks. Approximately 35.7% (n=5) of the DSM sample and 8.6% (n=3) of the NON-DSM group had sought treatment for their panic attacks in the past. The DSM sample was found to be significantly higher on this measure, $X^2(1)=5.39$, $p<.02$.

Stage 1 Analysis of Continuous Descriptive Data

The descriptive data included a number of continuous variables which were analyzed using analysis of variance, t-tests, and correlations. A 1 X 3, one-way analysis of variance was used to compare the NON-PAN, DSM, and NON-DSM groups on the variables of age, age at which drinking began, age at which drinking became a more serious problem, scores obtained on the MAST, and scores obtained on the DAST. Correlational analyses were used to compare MAST and DAST

scores. T-test analyses were used to compare the DSM and NON-DSM panic groups on the length of time they had been experiencing panic attacks.

Data pertaining to age showed the mean age of the total sample to be 31.39 yrs. (SD=8.8), with the DSM group obtaining the youngest mean age of 29.57 yrs. (SD=10.0) and the NON-PAN sample with the highest mean age of 32.04 yrs. (SD=8.6) (see Table 3). Analysis of Variance revealed no significant differences between groups on this measure.

With respect to the age at which drinking began, the mean age for the total sample was 14.56 yrs. (SD=5.8). The DSM sample had the highest mean age of 16.07 yrs. (SD=11.3) and the NON-PAN group began drinking at the earliest age with a mean of 13.56 yrs.(SD=3.5). No statistically significant differences were found to exist between NON-PAN, DSM, and NON-DSM groups on this measure.

The mean age at which problem drinking began for the total sample was 20.90 yrs. (SD=6.8). The DSM sample had the highest mean with an age of 21.35 yrs. (SD=10.6), while the NON-PAN had the youngest reported mean age of 20.00 (SD=3.4). No statistically significant differences were found between groups for this variable.

An analysis of MAST scores was also conducted. According to the originator of the MAST (Selzer, 1971) a MAST score of five or greater is sufficient to identify 98% of alcoholics surveyed. In the present investigation all

Table 3

Analysis of Variance and T-Test Comparisons Between Groups on Continuous Descriptive Variables.

Variable		NON-PAN (n=25)	DSM (n=14)	NON-DSM (n=35)	F score	df	P value
Age	M	32.04	29.57	31.65	0.37	2	.691
	SD	8.67	10.07	8.68			
Age began drinking	M	13.56	16.07	14.62	0.80	2	.453
	SD	3.57	11.32	3.50			
Age problem began	M	20.00	21.35	21.29	0.27	2	.764
	SD	3.40	10.62	6.77			
MAST	M	27.68b	40.07a	25.42b	6.59	2	.002
	SD	14.45	9.43	12.95			
DAST	M	10.28	15.42a	8.08b	3.71	2	.029
	SD	9.18	8.63	7.97			

Note. Means with different subscripts differ significantly at $p<.05$. Bonferrononi corrected T-Tests were used to establish significance between groups.

participants obtained a minimum MAST score of five to be included in the study. The mean MAST score for the total sample (N=74) was 28.95 (SD=13.8). Group mean scores on this measure ranged from 40.07 (SD=9.4) for the DSM group to 25.42 (SD=12.9) for the NON-DSM sample. The DSM group was found to be significantly higher than either of the NON-PAN, $t(71)=2.87$, $p<.005$, or the NON-DSM samples, $t(71)=3.58$, $p<.0006$, on this measure. The findings presented are consistent with previous investigations (i.e., Norton et al., 1989) who have reported that, of the alcoholics surveyed, those with the most severe alcoholic condition were the individuals who met the criteria for DSM-III-R Panic Disorder.

DAST scores were also obtained from all subjects. Based upon psychometric evaluations of the DAST a minimum score of six has been the suggested score necessary to identify clinical drug abuse problems (Skinner, 1982). Of the alcoholics surveyed in our investigation (N=74), 60.8% obtained high enough scores on the DAST (scores greater than 5) to be classified as having a multiple dependency. Inspection of the data (see Table 4) revealed the DSM sample to have the highest proportion of poly abuse subjects (78.6%) and the NON-DSM sample to have the lowest percent (51.4%). Statistically significant differences were not found between groups on this measure.

Table 4

Proportion of Each Group With a Multiple Dependency.

	NON-PAN (n=25)	DSM (n=14)	NON-DSM (n=35)	X^2	df	P value
Proportion (%)	64.0	78.6	51.4	3.25	2	.196

The mean DAST score obtained by the total sample was 10.21 (SD=8.8). The DSM group had the highest reported mean score on this measure with 15.42 (SD=8.6) and the NON-DSM sample had the lowest mean score of 8.08 (SD=7.9). The DSM group was significantly higher than the NON-DSM group on this measure, $t(71)=2.72$, $p<.008$ (see Table 3).

It is of interest to note that the DSM sample had the highest proportion of multiple drug abusers and a much higher DAST mean score than any of the other groups. These findings are consistent with previous research (e.g., Norton et al., 1889) which has suggested that alcoholics with more serious panic attack symptoms generally have more serious dependency problems.

Correlational analyses of the DAST and MAST measures were also conducted. Findings revealed a significantly high positive correlation of .31 between scores on the MAST and scores on the DAST, $t(72)=2.78$, $p<.05$ (see Table 5). These results are consistent with our earlier findings which

Table 5

Intercorrelations Between the MAST, DAST, Social Threat (Soc), Physical Threat (Phy), and Alcohol (Alc) Word Interference Scores.

	DAST	Soc	Phy	Alc
MAST	0.312*	0.122	-0.080	0.451**
DAST	--	-0.074	-0.147	0.050
Soc		--	0.010	0.024
Phy			--	-0.018
Alc				--

n = 74

*p<.05

**p<.01

indicated that the groups who obtained high alcoholism scores on the MAST generally had high drug abuse scores (DAST).

In general, the findings of drug use by alcoholics in our study are consistent with a number of other investigators (e.g., Kern, Hassett, Cohen, Lennon, & Schmelter, 1983) who have recognized the increasing evidence of poly-abuse problems with clients entering alcoholism treatment centers.

Finally, T-test analyses were used to compare the panic groups (DSM and NON-DSM) on the length of time they had been experiencing panic attacks (see Table 6). Analysis revealed the DSM group had been experiencing panic attacks for a mean of 16.35 (SD=11.9) years. The NON-DSM sample reported experiencing panic attacks for a mean of 16.71 (SD=10.5) years. No statistically significant differences were found between the two panic groups on the number of years they reported experiencing panic attacks.

Table 6

T-Test Analyses Comparing Panic Groups on the Duration of their Panic Attacks

		DSM (n=14)	NON-DSM (n=35)	T score	df	P value
Number of yrs. experiencing panic	M	16.35	16.71	0.10	47	.357
	SD	11.97	10.50			

Stage 2

Analysis of the Continuous Experimental Variables

There were two types of experimental word data analyzed in this section. There were word latencies scores and word interference scores. The first type of word data analyzed were the Stroop word latencies. Word latency was the actual time it required for the person to complete the color-naming task for each category of words. As mentioned earlier, analyses of the word latency scores were used to test the second hypothesis which stated that the neutral words would have the shortest latencies for each of the word categories.

The second type of data were the interference scores for each category of words. Interference scores were obtained by subtracting the control word latency times from the experimental word latency times for each category of words. Analyses of the word interference scores were used to test the first hypothesis which predicted that alcoholic panickers (especially DSM) would have higher interference scores than non-panicking alcoholics for words related to physical threat, social threat, and alcohol use.

Correlational analyses comparing alcohol word interference scores and MAST scores were also conducted to test the third hypothesis which predicted that those individuals who obtained high Stroop interference scores for alcohol words would also obtain high scores on the MAST.

Word Latency Comparisons

The means and standard deviations for the experimental and control word latencies for physical threat word, alcohol word, and social threat word categories are presented in Table 7. With reference to the experimental words, the alcohol words, in general had the longest response latencies with a mean score of 84.2 (SD=17.5). The social threat category of experimental words generated the lowest mean latency recorded which was 77.5 (SD=16.7).

With respect to the mean latencies for the control words, the alcohol control words resulted in the longest mean latency (M=77.94, SD=16.8), with the physical threat words next (M=74.59, SD=15.5), and the social threat control words with the shortest mean latency (M=73.31, SD=18.5).

Three additional analysis were conducted. The independent variables for each analysis were category of words (experimental words and control words) by clinical groups (NON-PAN, DSM, and NON-DSM). The dependent variables were the word latency scores for each category of words.

Analyses of Main Effects

Three 3 X 2 multivariate analyses of variance (MANOVA) comparisons were performed.

The first MANOVA (see Table 8) involved latency score comparisons of clinical groups (NON-PAN, DSM, and NON-DSM) and alcohol word types (alcohol words and alcohol control words).

Table 7

Mean Latencies and Standard Deviations of Experimental and Control Word Latencies.

		NON-PAN	DSM	NON-DSM	TOTAL SAMPLE
Physical threat words	n	25	14	33	72
	M	76.46b*	79.01a*	80.02a*	78.58
	SD	16.69	11.26	18.71	16.67
Physical control words	n	25	14	33	72
	M	73.57b	75.35a	75.05a	74.59
	SD	15.55	12.63	16.91	15.50
Alcohol words	n	25	14	33	72
	M	83.46b*	87.52a*	83.37b*	84.21
	SD	17.15	13.33	19.54	17.51
Alcohol control words	n	25	14	33	72
	M	77.03b	75.18c	79.80a	77.94
	SD	17.67	9.77	18.61	16.81
Social threat words	n	25	14	34	73
	M	74.53b*	79.04a*	79.22a*	77.58
	SD	16.68	11.39	18.63	16.74
Social control words	n	25	14	34	73
	M	71.45b	70.77b	75.72a	73.31
	SD	18.02	13.12	20.77	18.50

Note. Means with different subscripts differ significantly at $p<.05$. * M indicates significant ($p<.01$) difference between experimental words and control words for each group of subjects. Scheffe statistics were used to establish significance.

Table 8

Multivariate Analysis of Variance of Latency Scores for Clinical Comparisons and Alcohol Words.

Source	SS	df	MS	F	p
Grand Mean	834597.11	1	834597.11	1488.61	0.0
Clinical Grps. (A)	53.75	2	26.87	0.095	0.95
Alcohol Words (B)	1760.33	1	1760.33	44.39	0.00
AB	378.67	2	189.33	4.77	0.01
Error	2736.38	69	39.65		

With respect to the analysis of alcohol word latencies, the total N of 74 was reduced to 72 with the deletion of two cases that were missing alcohol word data. Results evaluating assumptions of normality, linearity, and multicollinearity were satisfactory.

With the use of Wilk's criterion, the dependent variable was found to be significantly affected by the word type, $F(1) = 44.39$, $p<.000$, and by the interaction between clinical groups and alcohol word type, $F(2) = 4.77$, $p<.01$, but not by the clinical group alone, $F(2)=0.09$, $p<.95$.

Multivariate analysis of physical threat word latencies was the second set of comparisons conducted (see Table 9). Comparisons were conducted between clinical groups (NON-PAN, DSM, NON-DSM) and physical threat word types (physical threat and physical threat control words).

The total N of 74 was reduced to 72 with the deletion of two cases that were missing physical threat word data. Results evaluating assumptions of normality, linearity, and multicollinearity were satisfactory.

With the use of Wilk's criterion, the dependent variable was found to be significantly affected by the physical word type, $F(1) = 13.17$, $p<.000$, but not by the clinical group variable, $F(2) = 0.19$, $p<.82$, or by the interaction between clinical groups and physical threat word type, $F(2) = 0.45$, $p<.64$.

Table 9

Multivariate Analysis of Variance of Latency Scores for Clinical Comparisons and Physical Threat Words.

Source	SS	df	MS	F	p
Grand Mean	744793.39	1	744793.39	1505.52	0.00
Clinical Grps. (A)	192.00	2	96.00	0.19	0.82
Phy. Thr. Words (B)	467.82	1	467.82	13.17	0.00
AB	31.90	2	15.95	0.45	0.64
Error	2451.32	69	35.52		

The third set of multivariate comparisons were the social threat word latencies (see Table 10). For this analysis word latency comparisons were made between clinical groups (NON-PAN, DSM, NON-DSM) and social threat word types (social threat and social threat control words).

The total N of 74 was reduced to 73 with the deletion of one case that was missing social threat word data. Results evaluating assumptions of normality, linearity, and multicollinearity were satisfactory.

With the use of Wilk's criterion, the dependent variable was found to be significantly affected by the social word type, $F(1) = 19.78$, $p<.000$, but not by the clinical group variable, $F(2) = 0.50$, $p<.61$, or by the interaction between clinical groups and physical threat word type, $F(2) = 1.76$, $p<.18$.

Analyses of Simple Effects

Post hoc analyses using a Scheffe statistical procedure was conducted to investigate the simple effects the clinical groups and the word groups had separately on the dependent variable (see Table 7).

Clinical group comparisons of physical threat word latency scores revealed that the DSM group had a significantly higher physical threat word mean latency than the NON-PAN group, $F(69)=20.97$, $p<.01$. The NON-DSM also

Table 10

Multivariate Analysis of Variance of Latency Scores for Clinical Comparisons and Social Threat Words.

Source	SS	df	MS	F	p
Grand Mean	721321.80	1	721321.80	1221.20	0.00
Clinical Grps. (A)	589.72	2	294.86	0.50	0.61
Soc. Thr. Words (B)	782.98	1	782.98	19.78	0.00
AB	139.14	2	69.57	1.76	0.18
Error	2770.25	70	39.57		

had a significantly higher physical threat word mean latency than the NON-PAN group, $F(69)=64.78$, $p<.01$.

With respect to the physical threat control word latencies, the DSM group had a significantly higher mean latency than the NON-PAN group, $F(69)=10.21$, $p<.01$. The NON-DSM group also had a significantly higher control word mean latency than the NON-PAN group, $F(69)=11.19$, $p<.01$. A comparison profile of the physical threat word latency means for each clinical group is presented in **Figure 1.**

Between group comparisons of the alcohol word categories revealed the DSM group to have a significantly higher mean alcohol word latency than either the NON-PAN, $F(69)=189.90$, $p<.01$, or NON-DSM sample, $F(69)=217.32$, $p<.01$.

Analysis of alcohol control word scores revealed that the means for all groups differed significantly from one another, with the NON-DSM sample obtaining a higher mean latency score than both the DSM, $F(69)=269.33$, $p<.01$, and NON-PAN samples, $F(69)=140.10$, $p<.01$. The NON-PAN group had a significantly higher mean alcohol word latency than the DSM group, $F(69)=39.42$, $p<.01$. A comparison profile of the alcohol word latency means for each clinical group is presented in **Figure 2.**

Analysis of the social threat word latencies revealed the DSM group had a significantly higher mean score than the NON-PAN sample, $F(70)=21.66$, $p<.01$. The NON-DSM group also

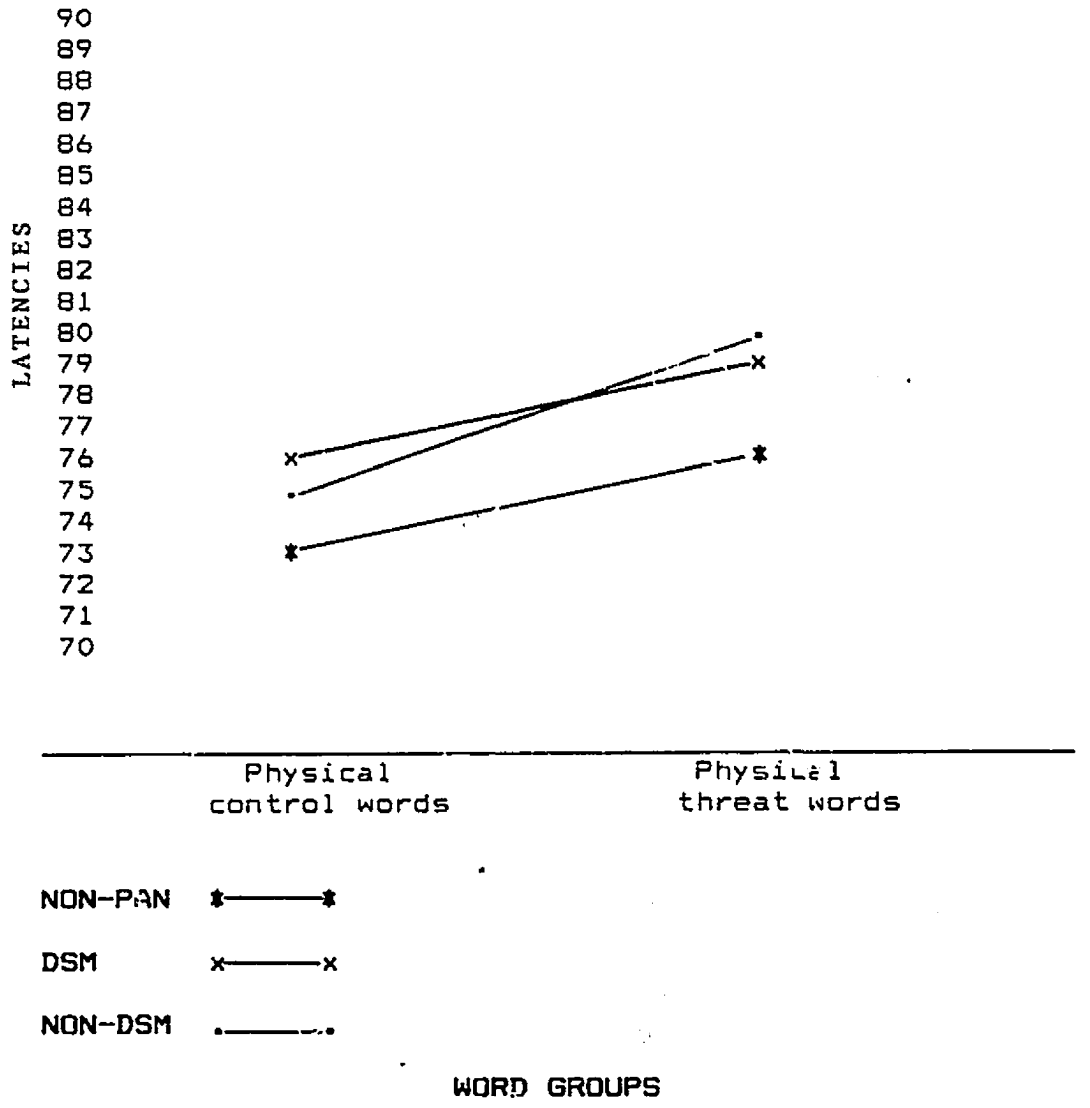

Figure 1. Clinical Group Comparisons of Physical Threat Word Mean Latencies.

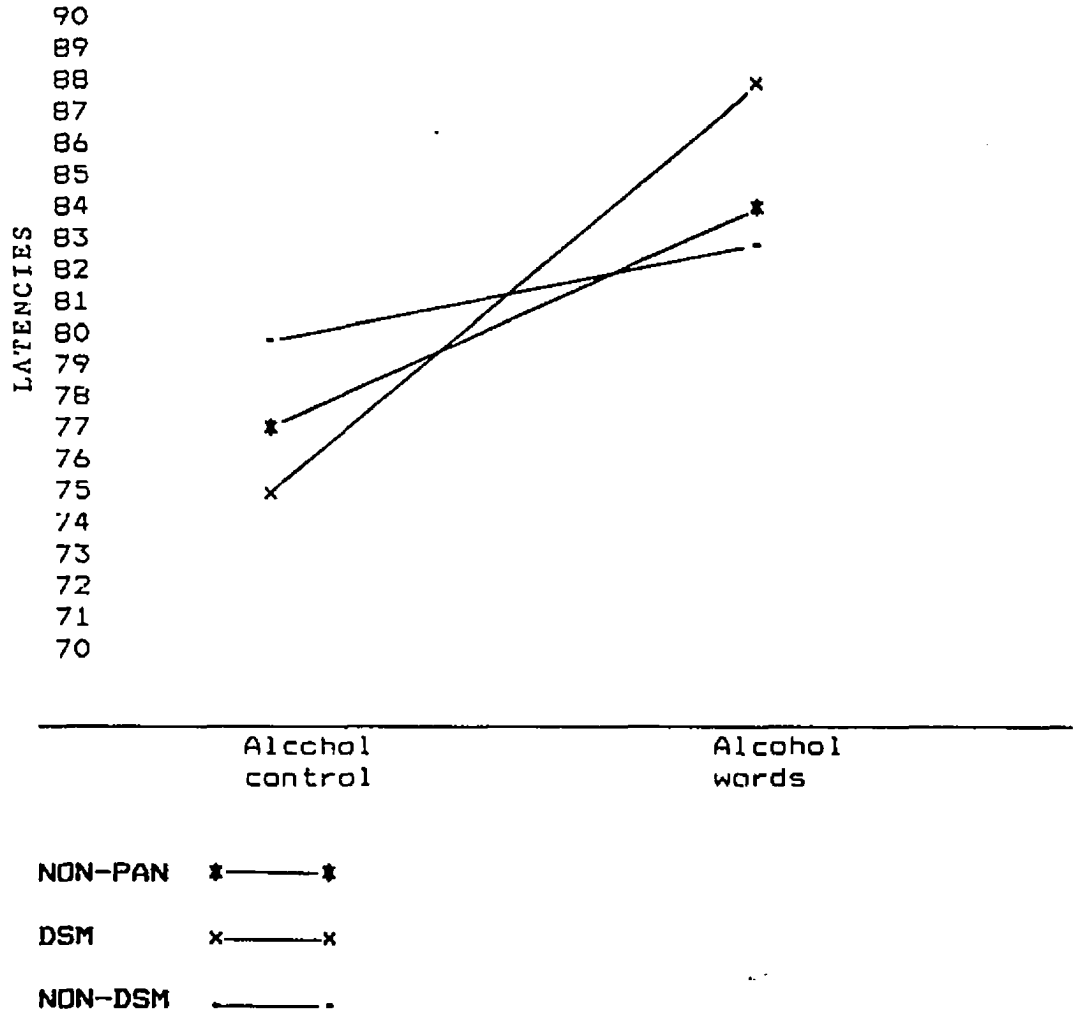

Figure 2. Clinical Group Comparisons of Alcohol Word Mean Latencies.

had a significantly higher mean social threat latency than the NON-PAN sample, $F(70)=37.61$, $p<.01$.

Analysis of social threat control word latencies revealed the NON-DSM sample to have had a significantly higher mean latency than both the DSM, $F(70)=28.84$, $p<.01$, and NON-PAN groups, $F(70)=31.18$, $p<.01$. A comparison profile of the social threat word latency means for each clinical group is presented in **Figure 3.**

Additional analysis comparing the experimental word latencies with the control word latencies for each group of subjects (NON-PAN, DSM, and NON-DSM) was also conducted. Findings showed that for all groups of subjects, and for each set of words (alcohol, physical threat, and social threat) the experimental word latencies were significantly higher than the control words within that same category. All F ratios and probability values for this measure are presented in **Table 11.**

The finding that the latencies for the experimental words were significantly longer than the control word latencies for every word category provides evidence to suggest that experimental words had a much greater distraction effect than the control words. This finding supports our second hypothesis which suggested that, because control words were assumed to have less attentional importance for our sample, the latencies would be shorter than the experimental word latencies for all groups.

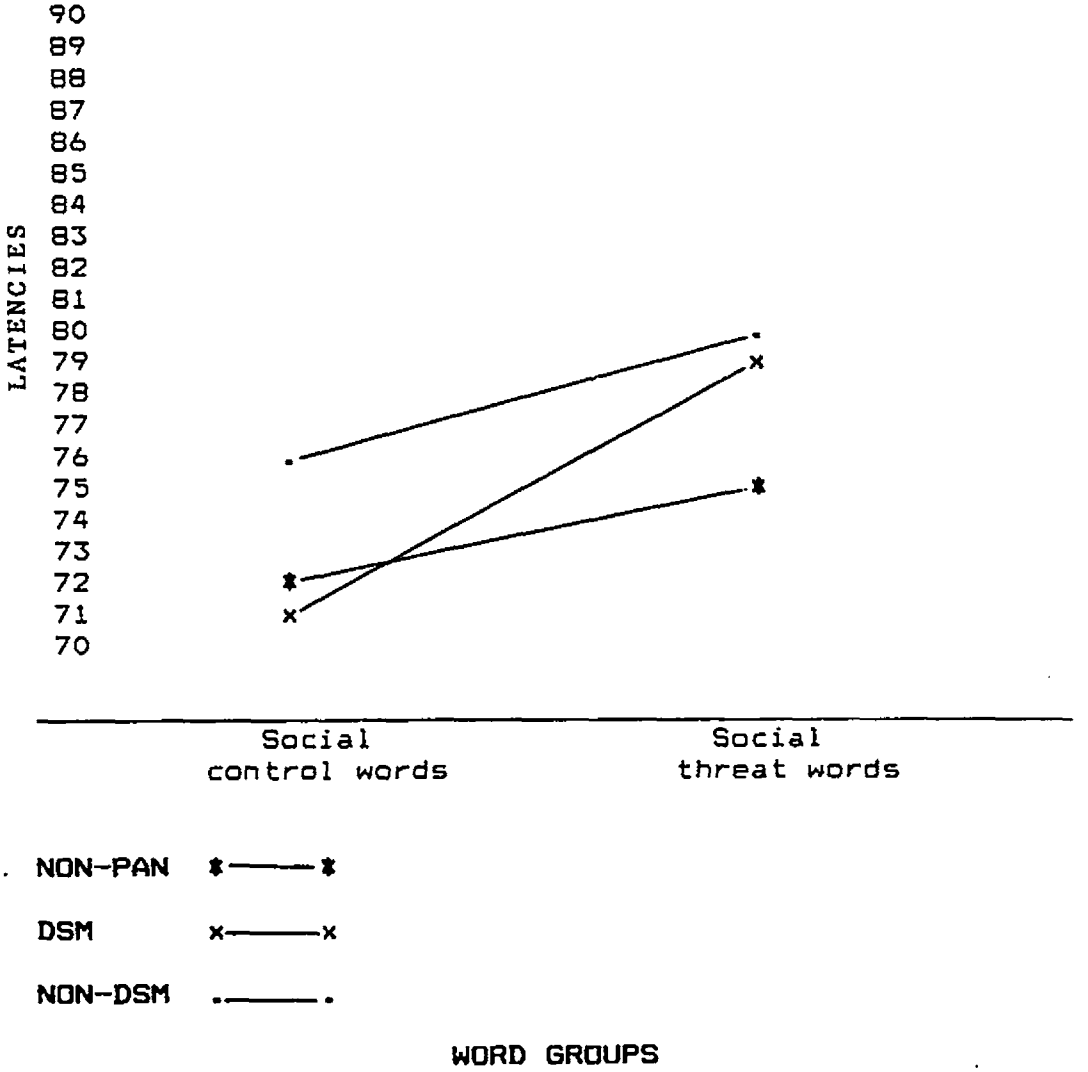

Figure 3. Clinical Group Comparisons of Social Threat Word Mean Latencies.

Table 11

Scheffe Statistical Comparisons Between Experimental and Control Word Latency Scores for Each Group.

DSM Group	df	F	p<
Alcohol Words vs. Alcohol Control Words	69	41.78	.01
Physical Threat vs. Physical Threat Control	69	13.83	.01
Social Threat vs. Social Threat Control	70	42.80	.01
NON-PAN Group			
Alcohol Words vs. Alcohol Control Words	69	20.25	.01
Physical Threat vs. Physical Threat Control	69	15.39	.01
Social Threat vs. Social Threat Control	70	10.60	.01
NON-DSM Group			
Alcohol Words vs. Alcohol Control Words	69	8.24	.01
Physical Threat vs. Physical Threat Control	69	60.11	.01
Social Threat vs. Social Threat Control	70	18.61	.01

Interference Score Comparisons

The interference scores used in the analyses are generated from the latency data. They are simply the scores remaining when the control word latency times are subtracted from the experimental word latency times for each category of words. Basically, the control words functioned as a baseline or comparative measure for the experimental words of each category. A set of interference scores were calculated for each of the three word groups. These included alcohol word interference scores (ALC), social threat interference scores (SOC), and physical threat interference scores (PHY).

Analyses of the word interference scores were used to test the first and the third hypotheses. Multivariate analysis of variance comparing word category (alcohol, physical threat, and social threat) with clinical group (NON-PAN, DSM, and NON-DSM) on word interference scores was conducted to test the first hypothesis. Correlational comparisons between alcohol interference scores and MAST scores were used to evaluate the third hypothesis.

Analysis of the alcohol word interference scores revealed the grand mean interference score (N=72) to be 6.26 (SD=9.3). The DSM group obtained the highest mean score (M=12.33, SD=9.2) and the NON-DSM sample had the lowest mean score (M=3.60, SD=9.2) **(see Table 12).**

Table 12

Interference Score Means and Standard Deviations.

		NON-PAN	DSM	NON-DSM
Physical threat interference scores	n	25	14	33
		B	C	
	M	2.88	3.66	4.29
	SD	7.31	7.22	8.90
Alcohol word interference scores	n	25	14	33
		A	A	
	M	6.43 b	12.33 a	3.60 b
	SD	8.47	9.26	9.21
Social threat interference scores	n	25	14	34
		B	B	
	M	3.08 b	8.26 a	4.41
	SD	8.29	8.16	8.40

Note. Means with different lowercase subscripts differ significantly between groups (NON-PAN, DSM, and NON-DSM) at $p<.05$. Means with different uppercase subscripts differ significantly for the word type (social, physical, and alcohol) within groups at $p<.01$. Scheffe statistics were used to establish significance.

With respect to the physical threat interference scores, the grand mean for the total sample (N=73) was 3.99 (SD=8.3). The DSM sample obtained the highest mean physical threat interference score (M=3.66, SD=7.2), while the NON-PAN sample (M=2.88, SD=7.3) obtained the lowest score.

Examination of the social threat interference scores revealed the grand mean (N=73) to be 4.27 (SD=8.9), with the DSM group obtaining the highest mean score (M=8.26, SD=8.1) and the NON-PAN group obtaining the lowest score (M=3.08, SD=8.2) on this measure.

Analyses of Main Effects

A 3 X 3, multivariate analysis of variance was employed to test the first hypothesis of the study. The independent variables were the three clinical groups (NON-PAN, DSM, and NON-DSM) and the three categories of Stroop words (alcohol, physical threat, and social threat). The dependent variable was the interference score that subjects obtained under each experimental condition.

BMDP MANOVA was used for the analysis. The total N of 74 was reduced to 71 with the deletion of two cases that were missing alcohol and physical word data, and one case with a missing social word score. Results evaluating assumptions of normality, linearity, and multicollinearity were satisfactory.

With the use of Wilk's criterion, the dependent variable was found to be significantly affected by the main effects of clinical groups, $F(2) = 3.76$, $p<.028$, and word types, $F(2) = 3.26$, $p<.041$, but not by their interaction, $F(4) = 1.68$, $p<.157$ (see Table 13).

To investigate the impact of each main effect on the dependent variable, post hoc analyses for simple effects using a Scheffe statistical procedure was conducted.

Analysis of Simple Effects

With regard to the first main effect, namely clinical groups (see Table 13), the DSM group had a significantly higher mean alcohol word interference score than the NON-DSM sample, $F(68)=14.40$, $p<.01$. The DSM group also had a significantly higher mean alcohol word interference score than the NON-PAN group, $F(68)=6.07$, $p<.05$.

Comparisons of the physical threat word interference mean scores revealed no statistically significant differences between any of the experimental groups included in the analysis.

Statistical comparisons of the means for social threat word interference scores revealed the DSM group to have a significantly higher mean score than the NON-PAN group on this measure, $F(68)=9.39$, $p<.05$. A comparison profile of

Table 13

Multivariate Analysis of Variance of Interference Scores for Clinical Comparison Groups and Type of Stroop Word.

Source	SS	df	MS	F	p
Grand Mean	5604.74	1	5604.74	79.38	.000
Clinical Grps. (A)	531.61	2	265.80	3.76	.028
Word Type (B)	469.49	2	234.74	3.26	.041
AB	485.44	4	121.36	1.68	.157
Error	9798.45	136	72.04		

the interference means for physical threat words, alcohol words, and social threat words by each clinical group is presented in **Figure 4.**

With regard to the second main effect, which was word type, Scheffe analyses of simple effects were also conducted to compare scores between each category of words (alcohol, physical, and social) for each group of subjects.

Findings revealed that, for the NON-PAN sample, alcohol interference scores were significantly higher than either the physical threat, $F(68)=22.81$, $p<.01$, or social threat scores, $F(68)=20.31$, $p<.01$. For the DSM group, alcohol word interference scores were found to be significantly higher than either the physical threat, $F(68)=76.21$, $p<.01$, or social threat scores, $F(68)=16.78$, $p<.01$. Interference scores for social threat words were also found to be significantly higher than the physical threat word scores for the DSM group, $F(68)=21.45$, $p<.01$. No statistically significant interference score differences between word categories were found for the NON-DSM group.

The interference score findings presented provide partial support for our first hypothesis, in that as predicted, the DSM group had significantly higher alcohol and social threat word interference scores than the NON-PAN sample. However, the physical threat interference scores did not differ significantly between groups. This finding was unexpected and did not support the first hypothesis.

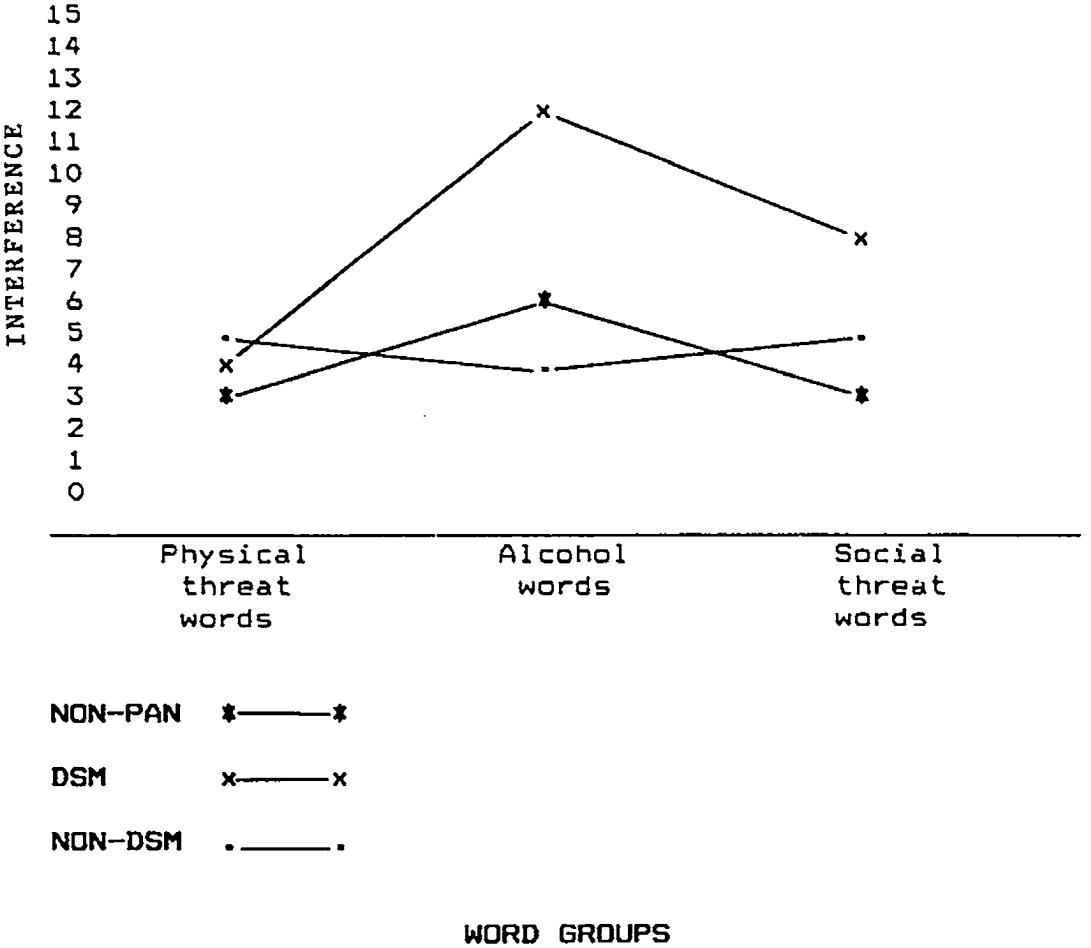

Figure 4. Clinical Group Comparisons of Mean Word Interference Scores.

The final analysis of the interference word scores involved a correlational comparison between alcohol word interference scores and MAST scores. The findings revealed a significantly high positive correlation of .45 between scores on the MAST and the alcohol word interference scores, $t(72)=4.37$, $p<.001$ (see Table 5). These findings support the third hypothesis which predicted that individuals who obtained high Stroop interference scores for alcohol words would also obtain high scores on the MAST.

CHAPTER IV

DISCUSSION

The findings of the present investigation provide substantial support for the hypotheses presented. Results indicated that those alcoholics who experienced the most severe forms of panic, such as the DSM group, tended to have much higher interference scores for the alcohol and social threat word categories than the other alcoholic samples. However, higher DSM interference scores were not found with every category of words, as had been predicted by the first hypothesis. Interference scores for the physical threat words did not differ between clinical groups.

Based upon the literature in this area (e.g., Hope et al., 1990), it has been suggested that higher interference scores for a particular category of words is an indication that the subject selectively attends to information related to that category of words. Following this rationale it is suggested that the alcoholics in our study, who experienced panic disorder, selectively attended to social threat and alcohol related stimuli to a greater extent than non-panic alcoholics. However, the panic disorder alcoholics did not appear to attend to the word stimuli that were assumed to be associated with their panic disorder condition (i.e. physical threat words) to a greater extent than the other clinical groups.

Despite the inconsistencies of the results, it is suspected that the Stroop program (Hope, 1990) used in our study may have detected, via word scores, preoccupations or concerns that the participants might have had with relation to the stimuli. The most convincing evidence found in support of an association between word latency and attentional concern was the apparent relationship between the alcohol word interference scores and the MAST scores obtained from each of the alcoholic samples. Findings indicated that, in general, the group that had the highest scores on the MAST (DSM alcoholics), also had the highest alcohol word interference scores. Conversely, those alcoholics who scored lower on the MAST, such as the NON-DSM sample, generally obtained lower alcohol word interference scores. These findings are consistent with the correlational data supporting the third hypothesis, which predicted a positive relationship would be found between MAST and alcohol interference scores. Analysis revealed a significant positive correlation of .45 between the scores on the MAST and the alcohol word interference scores.

With respect to the interference scores for social threat words, it is suspected that the significantly higher scores generated by panic disorder alcoholics may have been due primarily to the severity of their alcoholic condition as opposed to their panic condition. For example, the social threat words that were used in the study (e.g.,

failure, inferior, stupid) were all associated with an individual's sense of self-worth and self-esteem. Given the low levels of self-esteem that many alcoholics are reported to experience (Kaplan & Saddock, 1988), it would not be surprising to find that those alcoholics with the most profound drinking problems may also be most sensitive to concerns related to their self-esteem which could result in longer latencies for social threat words.

Even the unexpected findings for the physical threat words do not necessarily dispute the possibility that color-naming latencies reflect attentional processes.

Information related to the second hypothesis provides evidence to suggest that the physical threat words also had a distracting effect. Comparisons of the experimental and control word latencies revealed the control words to have had significantly shorter latencies than the experimental words for each category, including the physical threat word category. Therefore, it is suggested that the physical threat words, like the alcohol and social threat words, had a distracting effect. However, for whatever reason physical threat words had an equally distracting effect for all alcoholic groups.

Given the high levels of interference for physical threat words obtained by the anxiety disorder clients in other studies (e.g., Hope et al. 1990; Mogg et al. 1989; McNally et al. 1990), it is uncertain as to why the DSM

alcoholics in the present investigation failed to obtain significantly higher interference scores for the physical threat words than the non-panic alcoholics. Certainly there are many possible reasons which could account for interference score differences between alcoholic and non-alcoholic panic disorder patients. For example, gender differences may have had some influence on the results. The panic disorder groups that have been studied by many of the investigators in this area (e.g., Mogg et al. 1989; McNally et al. 1990) generally had a disproportionate number of females, whereas the majority (57.1%) of the panic disorder subjects included in the present investigation were male.

A more probable reason to account for the lower physical threat interference scores by the panic disorder subjects in the present study may have been that, relative to the concerns of alcohol, concerns regarding their panic attacks may not have seemed very important. In that, the alcoholic panic disorder clients who participated in our investigation may have been much more preoccupied with their alcoholic condition than they were with the panic attacks they experienced. In fact, of the DSM alcoholic panickers interviewed, many reported suffering from severe panic attacks for as long as they could remember (average of 16 yrs.). Even though this experience was very distressing, in many instances they seemed to have incorporated it as a part of their life. In most cases, despite their recent

abstinence from alcohol abuse, there was no evidence to suggest that they had experienced any changes in the number or severity of their attacks. Alcohol use on the other hand may have performed a more central role in their everyday operations. In addition to helping them cope with the stress of panic, the daily use of alcohol probably served as a necessary coping mechanism for normal functioning. Given their recent loss of this important means of coping it is not surprising that the alcoholics with panic disorder in our study might be overly concerned about alcohol, while concentrating much less on more static concerns such as their panic condition. As a consequence it might be expected that the alcoholic panic disorder subjects in our study would be more alert to alcohol related stimuli, and less attentive to panic related stimuli than the non-alcoholic panickers studied in other investigations (e.g., Hope et al. 1990; McNally et al. 1989).

Additional evidence which supports the suggestion that the panic disorder subjects in our study were possibly not as disturbed by their panic condition as the non-alcoholic panickers who participated in similar studies (e.g., Hope et al. 1990; McNally et al. 1989) was the fact that only 36% of the panic disorder subjects in our study had sought treatment for their panic condition in the past, while 100% of the panic participants from the non-alcoholic studies

(e.g., Hope et al. 1990; McNally et al. 1989) had sought out treatment for their panic problem.

In conclusion, the present investigation seemed to indicate that the color-naming task developed by Hope (1989) may be of considerable utility in assessing preoccupations and/or attentional processes. However, the scope of this approach is limited by our knowledge of the participants performing the task and by the limitations of language to communicate common meanings. It is felt that, because linguistic stimuli have the potential to influence individuals (or groups of individuals) in such different ways, the types of word stimuli to be employed must be carefully evaluated from the viewpoint of the subject population, if this measure is to have any utility.

For future research it would be interesting to explore to what extent a particular type of attentional stimulus influences behavior, or whether attention to this stimulus is merely a reflection of an individual's concerns. For example, it would be of interest to find out if certain environmental stimuli associated with alcohol act as cues to precipitate the use of alcohol for some alcoholics. It is felt that research in this area could provide useful information about substance abuse and the relapse process.

Michigan Alcohol Screening Test

Please indicate "yes" or "no" to each of the questions below.

		YES	NO
1.	Have you ever been arrested for drunk driving or driving after drinking?	___	___
2.	Have you ever been arrested, even for a few hours, because of drunken behaviour?	___	___
3.	Have you ever been patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was part of the problem?	___	___
4.	Have you ever lost a job because of drinking?	___	___
5.	Have you ever been seen at a psychiatric or mental health clinic, or gone to a doctor, social worker, or clergyman for help with an emotional problem in which drinking had played a part?	___	___
6.	Have you ever attended a meeting of Alcoholics Anonymous (AA)?	___	___
7.	Have you ever been told you have liver trouble? Cirrhosis?	___	___
8.	Have you ever lost friends or girlfriends/boyfriends because of drinking?	___	___
9.	Have you ever been in a hospital because of your drinking?	___	___
10.	Have you ever had delirium tremens (DTs), severe shaking, heard voices or seen things that weren't there after heavy drinking?	___	___
11.	Have you gotten into fights when drinking?	___	___
12.	Do you ever drink before noon?	___	___
13.	Has drinking ever created problems with you and your spouse?	___	___
14.	Does your spouse (or parents) ever worry or complain about your drinking?	___	___
15.	Do friends or relatives think you are a normal drinker?	___	___
16.	Have you ever gotten into trouble at work because of drinking?	___	___
17.	Has your spouse (or any other family member) ever gone to anyone for help about your drinking?	___	___
18.	Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	___	___
19.	Have you ever awakened the morning after some drinking the night before and found that you could not remember a part of the evening before?	___	___
20.	Are you always able to stop drinking when you want to?	___	___
21.	Can you stop drinking without a struggle after one or two drinks?	___	___
22.	Have you ever gone to anyone for help about your drinking?	___	___
23.	Do you ever feel bad about your drinking?	___	___
24.	Do you feel you are a normal drinker?	___	___

D.A.S.T.

The following questions concern information about your involvement and abuse of drugs. Drug abuse refers to (1) the use of prescribed or "over the counter" drugs in excess of the directions and (2) any non-medical use of drugs. Carefully read each statement and decide whether your answer is yes or no.

		YES	NO
1.	Have you used drugs other than those required for medical reasons?	—	—
2.	Have you abused prescription drugs?	—	—
3.	Do you abuse more than one drug at a time?	—	—
4.	Can you get through the week without using drugs (other than those required for medical reasons)?	—	—
5.	Are you always able to stop using drugs when you want to?	—	—
6.	Do you abuse drugs on a continuous basis?	—	—
7.	Do you try to limit your drug use to certain situations?	—	—
8.	Have you had "blackouts" or "flashbacks" as a result of drug use?	—	—
9.	Do you ever feel bad about your drug abuse?	—	—
10.	Does your spouse (or parents) ever complain about your involvement with drugs?	—	—
11.	Do your friends or relatives know or suspect you abuse drugs?	—	—
12.	Has drug abuse ever created problems between you and your spouse?	—	—
13.	Has any family member ever sought help for problems related to your drug use?	—	—
14.	Have you ever lost friends because of your use of drugs?	—	—

15.	Have you ever neglected your family or missed work because of your use of drugs?	—	—
16.	Have you ever been in trouble at work because of drug abuse?	—	—
17.	Have you ever lost a job because of drug abuse?	—	—
18.	Have you gotten into fights when under the influence of drugs?	—	—
19.	Have you ever been arrested because of unusual behaviour while under the influence of drugs?	—	—
20.	Have you ever been arrested for driving while under the influence of drugs?	—	—
21.	Have you engaged in illegal activities in order to obtain drugs?	—	—
22.	Have you ever been arrested for possession of illegal drugs?	—	—
23.	Have you ever experienced withdrawal symptoms as a result of heavy drug intake?	—	—
24.	Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, bleeding, etc.)?	—	—
25.	Have you ever gone to anyone for help for a drug problem?	—	—
26.	Have you ever been in hospital for medical problems related to your drug use?	—	—
27.	Have you ever been involved in a treatment programme specifically related to drug use?	—	—
28.	Have you been treated as an out-patient for problems related to drug abuse?	—	—

Appendix C. The Anxiety and Panic Questionnaire.

APQ File #_____

Please provide the following information:

Age _____

Sex _____

Occupation _____

Educational Level _____

Marital Status (please check one):

_____Single (never married)
_____Cohabiting
_____Married
_____Separated
_____Divorced
_____Widowed

APQ

INSTRUCTIONS: Listed below are several questions concerning your experiences with panic. Before you proceed, it is extremely important that you read carefully the definition of panic given below. Only count your experience as panic if it meets this definition.

Definition of Panic: A panic attack is the experience of a sudden surge or spike of intense fear, terror, or feeling of impending doom accompanied by several of the following symptoms: heart racing or pounding; shortness of breath; sweating; dizziness or lightheadedness; feelings of unreality; tingling or numbness; choking; chest pain; trembling or shaking; hot flashes or chills; fear of dying, going crazy, or losing control. Although it is rare to have all of these symptoms during a panic attack, it is common to have several of these symptoms.

A panic attack differs from the feelings of nervousness, tension, or mild anxiety that most of us have when we worry about the circumstances such as school, work, or family. Unlike these milder forms of anxiety or tension, the feelings associated with a panic attack are more intense and come on very abruptly, similar to the rapid onset of feelings that would occur should you find yourself in a situation where you were in immediate danger (e.g., robbery). For this survey, do not count feelings of nervousness, tension, or mild anxiety as a panic attack. However, if these feelings of tension or mild anxiety are followed by a sudden surge of extreme fear, terror, or apprehension, then consider this a panic attack.

1. Have you ever felt a sudden rush of intense fear or anxiety or feeling of impending doom (panic attack)? *(Note: Answer "Yes" only if your experience meets the above definition of panic.)*

a. YES b. NO

IF NO, STOP HERE
AND GO TO QUESTION #13

1a. Have the attack(s) been limited to stressful situations, such as applying for a new job? *(Note: Answer "No" if you have had a panic attack at least once in a situation that doesn't usually make you anxious.)*

a. YES b. NO

1b. Have the attack(s) been limited to situations where you're the focus of others' attention (such as having to speak in front of a group of people)? *(Note: Answer "No" if you have had a panic attack at least once when you were not the focus of others' attention.)*

a. YES b. NO

1c. Have the attack(s) been limited to times when you were taking drugs or medicines, such as caffeine, alcohol, cocaine, marijuana, cold medicines, etc.? *(Note: Answer "No" if you have had at least one panic attack when you were not taking drugs or medicines.)*

a. YES b. NO

1d. Have the attack(s) been limited to times when you were physically ill? *(Note: Answer "No" if you have had at least one panic attack when you were not physically ill.)*

a. YES b. NO

2. Have you ever had a panic attack occur totally "out of the blue"? *(Note: Answer "Yes" if one or more of your panic attacks occurred in a situation where you were not expecting it, such as watching TV or sitting at home.)*

a. YES b. NO

3. At what age did you first begin to have panic attacks?

___ ___ Years Old

4. What were the feelings (symptoms) during your worst attack? *(Record a number from the scale below next to each feeling or symptom. For example, if you had mild chest pain during your worst attack you would record a "1" next to that symptom.)*

None	Mild	Moderate	Severe
0	1	2	3

___ shortness of breath
___ dizziness, unsteadiness, or feeling faint
___ heart racing or pounding
___ trembling or shaking
___ sweating
___ feeling like you were choking or smothering
___ nausea, stomach upset, or diarrhea
___ feeling things around you were unreal, or feeling detached from part of your body
___ tingling or numbness in parts of your body
___ hot flashes or chills
___ pain or pressure in your chest
___ feeling afraid that you might die
___ feeling afraid that you might go crazy
___ feeling afraid that you might lose control
___ feeling afraid that you might make a fool of yourself
___ feeling a sweet taste in your mouth

5. What are the situations in which you have experienced a panic attack? *(Note: Check all that apply, even situations in which you have had only one attack.)*

____public speaking	____driving	____taking a test
____using drugs or RX's	____argument	____airplane
____riding a bus or train	____sleeping	____after drinking coffee
____relaxing	____eating out	____shopping
____worrying about school	____closed-in place	____during exercise
____watching TV	____while physically ill	____large store or mall
____waiting in line	____argument	____working at a job
____during or after sex	____being left alone	____other (Please list)

_____

_____

6. Has there ever been a time where you have had four or more panic attacks all within a four-week period?

a. YES b. NO

7. Since your first panic attack has there ever been a period, lasting at least one month, when you worried a lot about having another attack?

a. YES b. NO

7a. During the past month, how much have you worried about having a panic attack? *(Circle one number from the list below.)*

0 Not worried at all during the past month
1 Rarely worried (i.e,. less than 10% of the days)
2 Occasionally worried (between 10 and 50% of the days)
3 Frequently worried (between 50 and 90% of the days)
4 Constantly worried (every day or almost every day)

7b. Some people are more frightened by panic attacks than others. If you knew that you were going to have a panic attack tomorrow, how much fear would you have anticipating the attack? *(Circle one number from the list below.)*

0 No fear
1 Mild fear
2 Moderate fear
3 Severe fear
4 Extreme (very severe) fear

8. How many panic attacks have you had in the last 30 days? *(Record the number in the space below. If you are unsure of the exact number, list one number that is your best estimate.)*

___ panic attacks in the last 30 days

8a. How many panic attacks have you had in the last 6 months? *(Record the number in the space below. If you are unsure of the exact number, list one number that is your best estimate.)*

___ panic attacks in the last 6 months

9. During the past month (30 days), how much have the panic attacks (or fear of panic) interfered with your life (e.g., school, job, social life, traveling)? *(Circle one number from the list below.)*

0 No interference/impairment
1 Mild interference/impairment
2 Moderate interference/impairment
3 Severe interference/impairment
4 Very Severe interference/impairment

10. Are there *now* situations, places, or activities that you avoid because you are afraid you might have a panic attack?

a. YES b. NO

10a. How much do you avoid each of the activities situations below? *(Place a number next to each activity.)*

0	1	2	3	4
Never Avoid	Rarely Avoid	Sometimes Avoid	Usually Avoid	Always Avoid

__High places	__Shopping malls	__Eating in restaurants
__Alcohol	__Open spaces	__Being alone
__Caffeine	__Waiting in lines	__Driving on a busy highway
__Exercise	__Enclosed spaces	__Movie theaters
__Buses or trains	__Bridges	__Walking along busy streets

__Other (Please List) _____

11. Listed below are a number of ways that people attempt to cope or manage panic attacks. Place a check next to each coping method that you have used.

__Prescription Medication	__Prayer/ Church	__Relaxation/ Yoga/ Meditation
__Alcohol	__Seeing a therapist	__Changing my thinking
__Distraction	__Exercise	__Talking to family / friends
__Cut down/ stop caffeine	__Reading about panic/ anxiety	

__Avoid situations or activities that bring on anxiety

__Other (Please List) _____

11a. Which of the above methods have worked best for you in helping you deal with panic attacks? *(Check only one.)*

__Medication	__Prayer/ Church	__Relaxation/ Yoga/ Meditation
__Alcohol	__Seeing a therapist	__Changing my thinking
__Distraction	__Exercise	__Support from family / friends
__Cut down/ stop caffeine	__Reading about panic/ anxiety	

__Avoid situations or activities that might bring onpanic or anxiety

__Other (Please List) _____

11b. What is the overall level of effectiveness of the method listed above? *(Note: Circle a number on the scale below.)*

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Not at all Effective		Slightly Effective		Moderately Effective			Very Effective			Totally Effective

12. To the best of your knowledge, did your panic attacks start before you began drinking heavily? a) yes b) no c) don't know

13. Have you ever sought treatment for alcohol abuse in the past (e.g., Alcoholics Anonymous) ? a) yes b) no

14. Approximately at what age did you start drinking?
_____ years/months

15. To the best of your knowledge, at what age did your drinking become a more serious problem? _____ years/months

16. Did you ever use any other drugs (e.g., cocaine, amphetamines, glue, etc.) prior to your alcohol abuse problem? If so, specify.

_____

17. Did you ever use any other drugs after your heavy drinking began? (circle the appropriate answer)

never rarely sometimes usually always

Appendix D. Practice word presentation.

*****PRESS SPACE BAR TO START TIMER*****
BOOK POSITION LEVEL BOOK HOUSE BOOK BOOK HOUSE POSITION

BOOK POSITION BOOK THING BOOK HOUSE LEVEL POSITION HOUSE

THING BOOK HOUSE THING LEVEL HOUSE HOUSE THING THING

HOUSE BOOK BOOK THING HOUSE THING LEVEL THING BOOK

HOUSE POSITION BOOK HOUSE HOUSE THING LEVEL LEVEL POSITION

BOOK THING POSITION LEVEL BOOK HOUSE BOOK THING LEVEL

Note: Actual presentations display words in different colors which are randomly determined by the computer.

Appendix E. Alcohol word presentation.

*****PRESS SPACE BAR TO START TIMER*****
BEER WINE SCOTCH SCOTCH WINE BEER WHISKEY WINE WHISKEY

SCOTCH WHISKEY WINE SCOTCH WHISKEY BEER SCOTCH BEER WINE

WINE WINE WINE WINE BEER WHISKEY WINE BEER RUM

BEER SCOTCH BEER BEER SCOTCH SCOTCH RUM WINE SCOTCH

RUM WHISKEY WINE BEER WHISKEY RUM WINE WHISKEY WINE

SCOTCH WHISKEY WINE WINE SCOTCH BEER WINE BEER WHISKEY

SCOTCH BEER RUM WINE RUM WINE WINE RUM RUM

WINE WINE RUM RUM SCOTCH WINE SCOTCH WINE BEER

SCOTCH WINE RUM WINE RUM WINE WINE SCOTCH SCOTCH

WHISKEY RUM WHISKEY SCOTCH WHISKEY SCOTCH WINE BEER SCOTCH

WHISKEY RUM WHISKEY WINE SCOTCH RUM WHISKEY WHISKEY WHISKEY

Note: Actual word presentations display words in different colors which are randomly determined by the computer.

Appendix F. Alcohol control word presentation.

*****PRESS SPACE BAR TO START TIMER*****

OIL GROUND LIGHTEN OIL TURF GROUND LIGHTEN GROUND GROUND

LIGHTEN LIGHTEN SITE TURF SITE TURF LIGHTEN OIL GROUND

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OIL LIGHTEN OIL OIL OIL SITE TURF GROUND SITE

OIL TURF TURF OIL OIL SITE SITE SITE TURF

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LIGHTEN SITE SITE GROUND TURF GROUND SITE GROUND LIGHTEN

LIGHTEN TURF LIGHTEN LIGHTEN OIL LIGHTEN SITE SITE TURF

Note: Actual presentations display words in different colors which are randomly determined by the computer.

*****PRESS SPACE BAR TO START TIMER*****

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HOSPITAL INSANE FATAL FATAL ILLNESS DOCTOR INSANE FATAL HOSPITAL

DOCTOR FATAL INSANE DOCTOR INSANE INSANE DOCTOR DOCTOR DOCTOR

ILLNESS FATAL DOCTOR DOCTOR FATAL HOSPITAL DOCTOR FATAL INSANE

FATAL ILLNESS FATAL FATAL INSANE HOSPITAL ILLNESS DOCTOR INSANE

HOSPITAL FATAL INSANE FATAL INSANE HOSPITAL HOSPITAL HOSPITAL INSANE

DOCTOR ILLNESS DOCTOR DOCTOR INSANE INSANE INSANE INSANE HOSPITAL

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FATAL DOCTOR FATAL HOSPITAL DOCTOR INSANE INSANE DOCTOR DOCTOR

ILLNESS HOSPITAL FATAL DOCTOR DOCTOR ILLNESS INSANE DOCTOR INSANE

Note: Actual word presentations display words in different colors which are randomly determined by the computer.

Appendix B. Physical control word presentation.

*****PRESS SPACE BAR TO START TIMER*****
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DEFIED UPWARD RAYON DEFIED UPWARD UPWARD RAYON REPORTED LEANING

Note: Actual word presentations display words in different colors which are randomly determined by the computer.

Appendix I. Social threat word presentation.

*****PRESS SPACE BAR TO START TIMER*****

INFERIOR INFERIOR BORING STUPID BORING FOOLISH STUPID FAILURE STUPID

FAILURE STUPID FOOLISH FAILURE FOOLISH BORING FOOLISH FAILURE BORING

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FOOLISH INFERIOR FOOLISH STUPID STUPID FOOLISH BORING FOOLISH INFERIOR

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FOOLISH FOOLISH FOOLISH BORING FAILURE INFERIOR INFERIOR INFERIOR INFERIC

Note: Actual word presentations display words in different colors which are randomly determined by the computer.

Appendix J. Social control word presentation.

*****PRESS SPACE BAR TO START TIMER*****

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METRIC PORTION OBSIDIAN METRIC NETWORK PORTION METRIC INSERT INSERT

Note: Actual presentations display words in different colors which are randomly determined by the computer.

You will have a chance to practice naming the ink colors in just a moment. First we would like you to rate the amount of angry, anxious and happy or pleasant feelings you are experiencing right now. Using the scale below please indicate the number that describes how you feel RIGHT NOW.

```
0------1------2------3------4------5------6------7-----8
not at all                  somewhat                 extremely
  angry                       angry                    angry
```

How angry do you feel right now?
(type in a number between 0 and 8 and press return).

```
0------1------2------3------4------5------6------7-----8
not at all                  somewhat                 extremely
 anxious                     anxious                  anxious
```

How anxious do you feel right now?
(type in a number between 0 and 8 and press return).

```
0------1------2------3------4------5------6------7-----8
  very                      somewhat                 extremely
unhappy                      happy                    happy
```

How happy do you feel right now?
(type in a number between 0 and 8 and press return).

Appendix L. Consent form.

Consent Form

The study you are about to participate in is concerned with how people respond to the environment around them. In this study we are particularly interested in how people respond to certain words they are presented with.

The study will take approximately one-half hour to forty-five minutes of your time. During this study you will be presented with a number of different colored words on a computer screen. Your task will be to name the colors of the words you see. Prior to the color-naming task you will be asked to fill out a questionnaire package. All information collected about the participants is strictly confidential and names will not be put on any of the forms. At no time will information pertaining to any individual subject be given to either the staff at Brentwood or to the subjects themselves. All information provided to interested parties will be given in the form of group data.

The executive members of Brentwood have approved of the present study, however please be aware that participation is completely voluntary and that you may withdraw from the study at any time without any repercussions to the treatment you are currently receiving.

When the study is complete, a general summary of the results will be posted at Brentwood. If you are interested in receiving your own copy of the results or you have any questions, please feel free to contact the primary investigator: Jeff Malan at (519) 974-8433 (Monday to Friday 8:30 - 11:30 A.M) or the research supervisor: Dr. R. Daly at (519) 253-4232 (ext. 2229). If you have any complaints or concerns regarding our study please contact Dr. Jim Porter (Chairperson of the University of Windsor, Psychology Department Ethics Committee) at 253-4232 (ext.7012).

I have carefully read and understood this agreement, and therefore I freely consent to participate in this study.

_____ _____

Participant's name Date

Welcome to the Color-Naming Task.

Don't be concerned if you are unfamiliar with computers because everything you need to know will appear on the screen.

You will be asked to name aloud the ink colors in which words are written.

house black happy

For example, with the above words you would say red, yellow, blue.

Name the colors ACROSS THE ROWS (rather than down the columns).

The computer will be timing you so NAME THE COLORS AS QUICKLY AS YOU CAN.

The experimenter will be pressing the space bar to start and stop the time

Press any key to continue

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