

**ALCOHOL CONSUMPTION AND BIASES
IN PERSONAL MEMORY FUNCTIONING**

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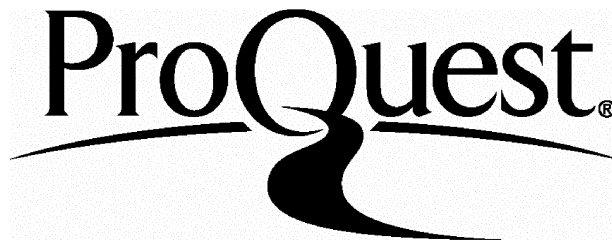
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In memory of my granddad, Stan Whiteley and my nan, Gladys Aggett.

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ABSTRACT

Previous research has demonstrated that participants from a number of clinical populations with different emotional disorders, (e.g. depression; Brittlebank et al 1993; Williams and Scott 1988) more readily retrieve generic rather than specific autobiographical memories to cue words. Other research has also established a tendency for people with emotional disorders to have preferential access (faster retrieval) to negative rather than positive memories from their past (Moore et al 1988; Williams and Scott 1988). This study attempted to extend this area of cognitive research into alcohol problems, by replicating these studies with a clinical sample of 'problem drinkers' (n = 26).

This study did replicate a number of the central findings of previous research into autobiographical memory function and emotional disturbance, but also generated novel findings. Compared to a non-clinical sample of 'social drinkers' (n = 29), the 'problem drinkers' did retrieve significantly more generic autobiographical memories to cue words and fewer specific autobiographical memories. The 'problem drinkers' were not significantly more general in their first memory response to positive rather than negative cue words compared to the 'social drinkers'. 'Problem drinkers' took longer overall to retrieve a specific memory but did not have a significantly longer latency to positive cue words. 'Problem drinkers' gave significantly more positive subjective valence ratings to memories retrieved in response to

positive cues than the 'social drinkers'. The 'problem drinkers' also subjectively rated the valence of specific memories retrieved in response to negative cues as more negative than the 'social drinkers'.

The tendency for retrieval of generic memories in 'problem drinkers' was not correlated with current alcohol craving, severity of alcohol dependence or measures of chronicity of alcohol problems.

The present study extends the research in this area by examining the responses of 'problem drinkers' to alcohol related cue words. Again, 'problem drinkers' were significantly more generic in their first autobiographical memory response than 'social drinkers', and significantly slower overall to respond to cue words with a specific memory. 'Problem drinkers' gave significantly lower subjective valence ratings to specific memories in response to the alcohol and non-alcohol cue words compared to 'social drinkers'.

This study additionally examined the role of memories in decisions to start / continue drinking and stop / reduce drinking. 'Problem drinkers' reported a greater desire to start / continue drinking in response to a memory than 'social drinkers', and a greater tendency to follow this desire through to drinking behaviour.

Chapter one: INTRODUCTION

“Drink! for you know not whence you came, nor why: Drink! for you know not why you go, nor where!”. Fitzgerald 1809 – 1883 (Oxford dictionary of quotations, p 213, 1986)

(i) HOW ARE ALCOHOL PROBLEMS A PROBLEM?

Consumption of alcohol has long been recognised as incurring potential dangers to an individual’s physical and psychological health as well as contributing to numerous social problems. The lifestyle of problem drinkers is likely to involve hangovers, sickness, arguments and declining social and economic status (Davidson and Ritson 1993). People may consume alcohol for a number of reasons, pleasure, relaxation, excitement etc. It is important for clinical practice and research to be aware of the subjective positive reasons for alcohol consumption in addition to the established negative effects on health and beyond. This recognition has been extremely elastic over time, often influenced by moral judgements (Plinius Maior Society 1994). The individual health risks and wider social implications of alcohol consumption have prompted a growing recognition of alcohol use within public health. In 1992 the Regional Committee for Europe of the World Health Organisation adopted a European Alcohol Action Plan.

Defining ‘normal’ and ‘problem’ drinking has proven extremely difficult.

Problems caused by alcohol consumption are seen at both an individual and

societal level. Problems can be seen in physical and psychological health, social functioning and interpersonal relationships. Excess alcohol consumption has financial implications and can be directly and indirectly implicated in crime. A person who drinks a bottle of spirits daily, whose social circumstance is collapsing rapidly and whose liver and general physical health is failing fast is comparatively easy to recognise as having an alcohol problem. There would be no such consensus about a person who is usually drunk on a Friday and Saturday night (Gossop 1995). In general, society seems eager to identify substance abuse problems where illegal drugs are involved, but more reluctant to do so in the case of legal substances such as alcohol (Gossop 1995). Any definition of alcohol problems needs to take account of the multi-axial nature of the consequences of alcohol consumption.

Per capita alcohol consumption in Britain rose by around 70% between 1950 and 1970, drunkenness offences almost doubled in the same period (Robertson et al 1984). Rates of alcohol consumption vary considerably across different countries. Even within Europe there is a greater than threefold difference between high consumption countries such as France and Italy and low consumption countries such as Norway (Robertson et al 1984). Differing patterns of alcohol consumption have been demonstrated in population studies between different age and gender groups. Frequent or occasional heavy drinking is relatively common in young males and uncommon in older women. Rates of total or near abstinence tend to show the reverse pattern (Robertson et al 1984). Negative social consequences of

alcohol consumption are most prevalent in teenage and young adult men. In the United Kingdom, 27% of males and 13% of females aged 18 and over drink in excess of the recommended sensible levels (Shakeshaft et al 1997). Recent years have seen concern over alcohol consumption extend to young teenagers. The size of the population of problem drinkers is reflected in both mortality and morbidity rates and in associated economic and social costs. In the United Kingdom it is estimated that there are between 25,000 – 40,000 alcohol related deaths each year (Shakeshaft et al 1997). The wide range of this estimate not only reflects the difficulty in soundly establishing links between drinking and mortality at an individual level but also the long term chronicity of alcohol problems. Miller (1991) comments on the long term progressive nature of alcohol problems, a factor often missed by short term cross sectional studies. In terms of morbidity, alcohol use accounts for around 20% of male hospital admissions in the United Kingdom. The estimated economic cost of alcohol problems in the United Kingdom exceeds £1500 million per year (Shakeshaft et al 1997). Socially, alcohol abuse has been implicated in crime, domestic violence, child abuse, suicide and road traffic accidents. The scale of alcohol problems, whether measured in terms of personal health, economic cost or social consequences is clearly substantial. Clinical and research evidence indicates alcohol problems are a chronic remitting and relapsing disorder (Miller 1991).

Advances in understanding problem drinking have fostered new attitudes towards alcoholism. However, the idea that drinking reflects 'moral weakness' is not uncommon (Robertson et al 1984). Health professionals

and lay-people generally understand problem drinking is an 'illness', especially if the person shows signs of physical dependence. Recent advances have demonstrated problem drinking to be a complex phenomenon with physical, psychological and social influences. "...dependence should perhaps be seen as being in the same group of disorders as phobic and obsessional states, with a potent, complicating, biological factor" (Edwards and Gross 1976).

(ii) COGNITIVE THEORIES OF ALCOHOL PROBLEMS

In recent years, there has been a re-evaluation of many of the traditional approaches to the treatment and management of people with alcohol problems (Saunders et al 1993). Many researchers and clinicians have made a strong case for broadening the base of treatment for alcohol problems (Saunders et al 1993). Shakeshaft et al (1997) advocate broadening the research base into alcohol problems, noting that despite a large body of research and clinical literature a significant level of alcohol disorders persists.

Of increasing interest are cognitive perspectives on the development and recovery from alcohol problems. Gossop (1995) writes the meaning that use of a substance has for the user has largely been underrated. A person does not suddenly fall victim to alcoholism; their attitudes, beliefs, intentions and expectations play an important role. Theories which view alcohol problems

as derived from external forces acting upon the person over which they have no control, can lead to serious errors in treatment and research.

Understanding the role of cognitive processes in drinking behaviour is of central importance. Problem drinkers who adopt the 'sick-role' view of their problems fare less well in treatment (Gossop 1995). Such a view may carry with it the assumption that sick people have no role in recovery from their problems. People with such beliefs may be very passive in treatment believing the problem can only be 'cured' by outside medical intervention (Gossop 1995). Research into the pharmacological effects of alcohol is divided over whether alcohol reduces anxiety and tension. While the objective physiological effects of alcohol consumption are important, of equal significance are alcohol users' expectations of the effects of alcohol. Many problem drinkers expect alcohol to reduce tension and this may be as influential in decisions to drink as objective pharmacological effects (Gossop 1995). People's beliefs and expectations of stopping drinking and / or entering treatment are central to their motivation to seek treatment and the maintenance of change facilitated in treatment.

One important area of cognitive input to interventions for substance misuse problems is the theory of stages of change. Prochaska and DiClemente (1982) described how smokers attempting to stop smoking moved through various stages in the process of changing their behaviour, precontemplation, contemplation, action and maintenance. A further stage, relapse was added later. These stages have subsequently been identified in all addictive disorders. The stages largely describe cognitive states of the individual. In

precontemplation the person has no inclination to change their behaviour and they may not be aware of the problems the behaviour is causing. Once a person has an awareness of the problems the behaviour is causing they have entered the contemplation stage. The person may begin to think about making changes to their behaviour but have yet to make firm commitments to take action. In the action stage a person attempts to modify their behaviour, experiences and / or environment to overcome their problems. After the action stage the person works actively to maintain the gains and changes achieved. People trying to change addictive behaviours often relapse to their former problem behaviour (Gossop 1995). Relapse as a stage makes the whole model into a cycle of changes and movements through various stages, although with each change the person carries with them skills and experiences acquired from previous changes. Relapse is seen as a setback that can be managed, rather than a final failure. In recognition of this, Prochaska and DiClemente revised their model to a spiral of change (Prochaska et al 1992). The spiral model suggests people rarely regress to the precontemplation stage. With each revisit to a stage, people potentially learn from their mistakes and can try something different next time (Prochaska et al 1992). This model has implications for directing specific interventions to people at different stages of change, adapting the input to the current needs of the individual (Prochaska et al 1985). People in the precontemplation stage require help to become aware of the problems their behaviour is causing (Gossop 1995). To direct someone in the precontemplation stage towards behavioural change is unlikely to be effective, as this would not address the current cognitive state of that person.

Relapse prevention has become an influential model of treatment for alcohol problems and other substance misuse disorders. Relapse prevention is a self management strategy to maximise the maintenance stage of behavioural change. Relapse prevention is a cognitive intervention derived from the principles of social learning theory. It aims to help a person identify and manage potential influences that may produce a relapse (Gossop 1995). Such influences could be environmental, social or psychological. In relapse prevention, identification and management of situations where the person is at 'high-risk' of relapsing are central. The triggers for such 'high-risk' situations could be internal or external. Cognitive strategies are foremost in techniques for managing these situations. Problem drinkers with more and varied coping styles, along with good problem solving skills, are more likely to survive a relapse. Cognitive control is the strongest indicator of who is likely to survive a relapse (Gossop 1995).

The role of individual cognitive styles in treatment for alcohol problems is of considerable importance. The social and psychological characteristics of problem drinkers on admission to treatment are a powerful predictor of outcome in terms of behaviour change. Such factors may well have more effect on outcome than any measured treatment input factor (Gossop 1995).

The role of urges and cravings as cognitive features of addictive behaviours has been considered central from the outset of scientific conceptualisations of addiction. Early theories considered craving to be an essential

characteristic of alcoholism. Craving was used to explain initiation and maintenance of problem drinking and was thought to be of primary importance in relapse to alcohol use after abstinence (Tiffany 1990). Craving became less of a central characteristic of relapse to drinking after it was established that abstinent problem drinkers did not necessarily revert to out of control drinking when they drank small amounts of alcohol, as previous craving based theories would suggest (Tiffany 1990). Models of drug urges generally consider cravings to arise from one of two sources; drug withdrawal or the positive reinforcing effects of drug use. However, people often report continued experience of urges and cravings after the acute withdrawal stage, this can even be many years after acute withdrawal. Urges and cravings which persist beyond acute withdrawal could be explained by learning processes. People abstinent from alcohol or drugs who are exposed to situations that have been associated with their alcohol or drug consumption may experience conditioned withdrawal responses or conditioned compensatory responses producing urges and cravings (Tiffany 1990).

One striking feature of alcohol is its apparent appetitive, positive reinforcing effects. Experimental studies can show self-administration of alcohol in animals to levels of intoxication or dependence. Memories for the positive reinforcing effects of alcohol use may represent a major factor in alcohol craving (Tiffany 1990). Similarly, expectations of the positive effects of alcohol consumption may also stimulate cravings. To date most theories assume that urges are necessary but not sufficient to produce drug seeking and consumption behaviour. However, Tiffany (1990) reports that in a great

number of studies, relapse to drug use does not always occur after self report of urges, so these studies do not provide support for the assumption that self report of urges and drug consumption are strongly related. Tiffany (1990) disagrees that urges and cravings are necessary for the initiation and maintenance of drug consumption. The psychological processes which promote drug use behaviour and those that control urge responding may operate independently.

Tiffany proposes an alternative theory invoking concepts of automatic and nonautomatic cognitive functioning. Automatic functioning is characteristic of most of our daily activities. After practice, an action (or series of actions) can be executed with less effort, attention and concentration, the person may have little awareness of the component actions. A classic example is car driving, in the early stages of learning each action is very thoughtful and deliberate but after repeated practice the actions can be successfully employed with very little conscious attention. Nonautomatic functioning represents effortful and deliberate actions requiring considerable cognitive input as with new behaviours or familiar behaviours under changed circumstances. In Tiffany's theory, alcohol use behaviours are controlled largely by automatic processes, while urge responding is controlled by nonautomatic processes. Over a history of repeated practice, the cognitive systems controlling many aspects of alcohol acquisition and consumption take on the character of automatic processes (Tiffany 1990). Alcohol consumption may become efficient, initiated and completed with little intention and difficult to block in the presence of triggering stimuli. Such

triggering stimuli may be either external (e.g. environmental locations) or internal (e.g. emotional states or memories). Urges and cravings for alcohol represent nonautomatic processes, requiring considerable cognitive effort to resist if the person is attempting to control drinking behaviour. Tiffany (1990) is able to explain relapses to drinking in the absence of urges as a return to previously developed automatic functions where nonautomatic processes required to maintain abstinence are not sufficient to impede the automatic functions. Such relapses may occur when the cognitive capacity of the person is compromised by a competing requirement, e.g. stress or negative emotional state. The active contemplation of memories (positive or negative) could represent a competing cognitive requirement, reducing the cognitive capacity available for nonautomatic functioning required to maintain abstinence in the face of conditioned stimuli.

(iii) ALCOHOL PROBLEMS AND EMOTIONAL DISORDERS

Substantial evidence from community and clinical populations demonstrates that alcohol dependence is not a unitary or homogeneous disorder.

Additional emotional disturbances and psychopathology are common (Davidson and Ritson 1993). Partly because of differing methodologies, estimates of additional psychological problems in people with alcohol disorders vary. Up to two thirds of people with alcohol disorders will have a lifetime diagnosis of another psychological disorder (Davidson and Ritson 1993). Co-morbid psychiatric problems are likely to alter the course of

alcohol disorders. An additional psychological problem may hasten the development of dependence to alcohol and could bring individuals to the attention of services more quickly. Underlying psychiatric factors may predispose some people to develop alcohol problems and conversely, alcoholism might play a part in the onset of a mental health problem. Psychiatric symptoms may arise as a result of acute or chronic effects of alcohol, but psychiatric disorders and alcohol problems can also co-exist independently (Belle Glass and Marshall 1994).

The Maudsley Hospital Survey found 10% of psychiatric patients had an alcohol problem, 40% of whom had an additional psychiatric diagnosis (Belle Glass and Marshall 1994). The prevalence of secondary psychiatric disorders within male populations of primary alcoholism are in the order of 43%, where primary and secondary disorder are defined by chronology of development of symptoms (Davidson and Ritson 1993). In community studies, women with alcohol problems were more likely than men to have a secondary psychiatric diagnosis. Problem drinking men with a secondary diagnosis were also more likely to suffer greater physical, psychological and social impairment. When any additional psychiatric diagnosis is considered, men with alcohol problems and an additional disorder were more likely to drink more frequently and heavily than men with no additional disorder (Davidson and Ritson 1993).

The co-occurrence of alcohol problems and depression has been well documented. Results from the US Epidemiological Catchment Area (ECA)

survey show the co-morbid occurrence of the two disorders to be approaching twice the level that would be expected by chance association alone (Brown et al 1997). Rates of co-morbidity of alcohol problems and depression are even higher among patient samples. In an alcohol treatment-seeking sample, 22.6% of participants had a lifetime history of major depressive disorder (Brown et al 1997). Using depressive symptom rating scales, e.g. the Beck Depression Inventory, rates of co-morbidity are generally higher than when structured diagnostic interviews are used. As many as 65% - 85% of patients entering alcohol treatment reported clinically significant levels of depressive symptoms (Brown et al 1997).

Depression seems to be more common in in-patient problem drinkers compared to community samples. Assessed not later than 5 days after admission, depression in the index episode of alcoholism in in-patients has been found to be 30.2%. Less than a quarter still fulfilled the criteria for major depression after two weeks of abstinence (Davidson and Ritson 1993). In populations of people with secondary depression, alcoholism was the most common primary disorder (Davidson and Ritson 1993). The prevalence of depression in clinical samples of people with alcohol problems may be inflated as someone with alcohol problems and depression may be more likely to seek treatment than someone with alcohol problems alone. This is the so-called Berkson bias, reflecting the increased tendency for people with more than one diagnosis to receive treatment and therefore be available to be recruited into research samples.

The relationship between alcohol problems and depression is complex. At an observational level, the life of a problem drinker is likely to involve hangovers, sickness and negative social, occupational and financial consequences. Equally, the use of alcohol as a 'pick me up' to relieve anxiety or negative mood is possible. Despite the common belief that people drink alcohol to manage low mood or anxiety, it has not been clearly established that the mood altering properties of alcohol are a primary reason for consumption (Davidson and Ritson 1993). The vast majority of laboratory research has concentrated on investigating the links between alcohol consumption and anxiety rather than depression. Davidson and Ritson (1993) report studies are largely in agreement that, for low doses of alcohol, people report a positive effect on mood. At much higher doses dysphoric mood states are observed. However, this still leaves unexplored the extent to which negative mood provokes alcohol consumption.

Clinically, the co-occurrence of alcohol problems and depression is important and has been associated with poor treatment outcome. There appears to be a positive association between relapse and increase in depressive symptoms. In cross-sectional studies greater depressive symptoms after alcohol treatment has been associated with relapse (Brown et al 1997). Negative mood state situations are frequently reported as a precipitant of relapse to alcohol use, accounting for up to 38% of relapse occasions (Brown et al 1997). The role of depression in relapse is not clear. People with alcohol problems and depression are more frequent attenders at services and were therefore exposed to more treatment for both disorders. The

literature clearly demonstrates a substantial level of co-morbidity of alcohol problems and depression as well as other emotional disorders. A causal role for alcohol in depression and vice versa has not been established. The effects of alcohol on an individual's psychosocial functioning may lead to feelings of guilt and hopelessness, which in combination with the physical consequences of sustained heavy drinking may increase vulnerability to development of a depressive illness. The rates of completed suicide in people with alcohol problems are higher when compared to rates in alcohol problem free groups. Approximately 30% of attempted suicides involve alcohol problems, and in the region of 8% of former in-patient problem drinkers kill themselves (Belle Glass and Marshall 1994).

(iv) ALCOHOL USE AND MEMORY

The effects of alcohol use on memory functioning have been demonstrated in a number of research studies (e.g. Lister et al 1991, Roehrich and Goldman 1995). Clinically, clients in alcohol treatment services often report subjective experiences of disruption to memory functioning after alcohol consumption. This frequently takes the form of inability to remember extended periods of time – memory blackout. Culturally and clinically, the idea of drinking to forget is prevalent.

Extended heavy consumption of alcohol has been associated with the organic brain damage, often leading to the diagnosis of Korsakoff's

Syndrome (Barba et al 1990). The typical functional markers of Korsakoff's Syndrome are amnesia and confabulation. Korsakoff's Syndrome clearly affects autobiographical memory capacity leading to "a deficit in the system that receives and stores information about temporally dated episodes or events" (Barba et al 1990, p525). In contrast semantic memory, memory for verbal symbols and facts, is generally preserved in Korsakoff's patients.

Lister et al (1991) suggest the effects of alcohol are not global but selective. Lister et al investigated implicit and explicit memory functioning in healthy volunteers after consumption of alcohol. Alcohol consumption impaired participants' explicit memory but no impairment was shown in implicit memory. Acute alcohol intoxication thus impaired participants' ability to explicitly or 'consciously' recall previously presented material. Implicit memory (which does not require overt conscious recollection) was preserved.

Conversely, the role of memories in influencing alcohol consumption has received little attention. Logically, one might suspect that positive memories of previous occasions of alcohol consumption are important in the development of decisions to drink. Equally, remembering negative experiences of the physical or social consequences of excessive consumption may serve to reduce future consumption. Beyond this it may be possible that certain idiosyncratic memories function as cues to prompt further alcohol consumption, similar to situational or affective cues. In line with Tiffany's (1990) theory, the active contemplation of memories or the intrusion of trauma related memories, could represent competition for

cognitive resources with the nonautomatic functioning necessary to prevent relapse. In this respect memories could be instrumental in a relapse to drinking by consuming cognitive capacity that would otherwise have been deployed to maintain abstinence or control. Recent research has begun to explore whether memories accessed when intoxicated with alcohol play any role in the decisions of problem drinkers to continue drinking (Curran, personal communication). Research has established a link between Post Traumatic Stress Disorder (PTSD), characterised by intrusive memories of a traumatic event, and alcohol consumption (Stewart, in press). The nature of the relationship between PTSD and alcohol problems has not been established. People with PTSD may consume alcohol to self medicate against the distress of cognitive re-experiencing of the traumatic event. Alternatively, people with alcohol problems, exposed to a traumatic event may find it harder to cope with the trauma and are therefore more likely to develop PTSD (Stewart, in press).

(v) AUTOBIOGRAPHICAL MEMORY AND EMOTIONAL DISORDERS

Autobiographical memory biases

Autobiographical memory is a person's memory for events that have happened to them during their life. Autobiographical memory in populations with various emotional disorders has been the subject of a number of research studies (e.g. Williams and Scott 1988, Kuyken and Dalgleish 1995). One of the frequently used paradigms to examine autobiographical memory

is the Autobiographical Memory Test (AMT) (Williams and Broadbent 1986), which is a procedure derived from the Galton cueing technique. In this test, participants are asked to provide a memory of a specific event from their past in response to a cue word. A number of positive, negative and neutral cue words are used. The latency to respond to each word with a specific memory is measured. Each response is later judged by the experimenter to be either specific, extended or generic.

A number of differences in styles and features of autobiographical memory recall have been demonstrated in several clinical populations when compared to non clinical participants. When asked to provide 'specific' personal memories, people with emotional disorders show a marked tendency to produce 'generic' memories, 'extended' memories or are unable to produce any memory (omission). A specific memory is operationalised as the recall of an event which took place over a period of time lasting less than one day, i.e. "going for a walk last Sunday", a generic memory is a summary of many events i.e. "going for walks". An extended memory is where the single event recalled took place over a period lasting more than one day i.e. "my walking holiday in Spain last August" (Phillips and Williams 1997).

Williams and Dritschel (1992) state that generic memories are qualitatively different to extended memories and in terms of autobiographical memory represent different forms of error. The failure of autobiographical memory in emotional disturbance is entirely accounted for by an excess of generic memories, rather than an excess of generic *and* extended memories. These two forms of autobiographical memory error are independent. Participants

who give more of one type of response do not also give more of the other type. Cue types that have a tendency to elicit more of one type of memory do not also tend to elicit more of the other type. Extended memories are perhaps more similar to specific memories given that they successfully discriminate one event from others despite lasting for a longer time than specified.

Autobiographical memory, depression and suicide

Consistent clinical research shows information processing biases play a major role in the development and maintenance of emotional disorders (Burke and Mathews 1992). Such biases are likely to influence many different cognitive operations, including the selective recall of mood congruent information. Some research evidence suggests that depression is associated with a bias towards remembering negative events from the past, a reversal of the normal tendency towards remembering positive events (Williams and Scott 1988). This tendency for mood congruent memory bias has been demonstrated both in induced mood studies in the laboratory and with studies of clinically depressed people. Williams and Broadbent (1986) report that patients who had recently taken an overdose and were still depressed had more difficulty retrieving positive events compared to non-depressed controls. Although depressed people experience a greater number of lifetime negative events than non-depressed people, it has been established that the autobiographical memory bias is not accounted for by this frequency effect (Williams 1996) or by a bias in the categorisation of a memory as negative (Williams and Scott 1988). The evidence however, is

far from universal. Whether depressed people recall more easily negative rather than positive memories has conflicting findings. The tendency for college students with induced depressed mood to be slower in recalling happy memories has been demonstrated, however, a reciprocal effect for sad memories has not been established (Kuyken and Dalgleish 1995).

A more robust finding is the tendency for people with depression to recall generic rather than specific memories compared to those without depression (Kuyken and Dalgleish 1995). Williams and Scott (1988) found depressed people were less likely to give specific autobiographical memories when compared with controls. In this study, depressed patients retrieved specific memories, on average, 40% of the time; non-depressed controls retrieved specific memories 70% of the time. These findings were replicated by Kuyken and Dalgleish (1995) and Kuyken and Brewin (1995). Williams and Scott (1988) further reported that the tendency towards generic memories in depression was more pronounced in response to positive compared with negative cues. Williams and Broadbent (1986) found patients who had recently taken an overdose and were depressed had a greater tendency to be generic in response to positive cue words more than negative cue words.

Consistent with earlier theories, Phillips and Williams (1997) found little relationship between severity of depression and the degree of impaired specificity in autobiographical memory. Kuyken and Brewin (1995) found a low and nonsignificant correlation between severity of depression (measured by the Beck depression inventory) and generic autobiographical memory.

This supports the hypothesis that the tendency towards generic autobiographical memory in depression is a long-term cognitive style unaffected by state depression. Williams and Dritschel (1988) studied 16 people who had taken an overdose between 3 and 14 months before participation. Responses were compared to a group of participants in current suicidal crisis and a group of control participants from a subject panel. Ex-patients and current patients did not differ significantly in the proportion of responses that were specific, and both groups were significantly different from the control group (54%, 46% and 71% respectively). Within the group of ex-patients there was no difference between the responses of those who remained depressed and those who had recovered more fully. Williams and Dritschel suggest their results show generic memory may be a life long cognitive style perhaps rendering people more vulnerable to depressive moods. In a longitudinal study, Brittlebank et al (1993) studied participants at three time points, admission, 3 & 7 months later. There was no reliable fall in recall of generic memories over this period.

Autobiographical memory and other emotional disorders

Demonstrating autobiographical memory biases in populations other than depressed / suicidal people adds support to the theory that a tendency for generic memory recall underlies emotional disturbance. Phillips and Williams (1997) report decreased autobiographical specificity with increasing levels of cognitive impairment in older people. The nature of autobiographical memory impairment found was a bias towards generic memories and omissions with a negligible proportion of extended memories. Wright and

Morley (1995) studied autobiographical memory recall in people experiencing chronic pain. They noted that although most psychological models of pain ascribe a central role to memory for previous pain events, little research examined the relationship between pain and memory in any systematic way. The majority of research into pain and memory concentrates on establishing the accuracy of memories for pain events in clinical populations. Wright and Morley (1995) report mixed support for their hypothesis that the state of pain biases recall of autobiographical memories of pain events. People experiencing chronic pain displayed a tendency towards recalling pain related events although this effect fell fractionally short of the 0.05 significance level when compared to the responses of non-chronic pain controls. People experiencing chronic pain were faster to recall pain related rather than non pain related events. Wright and Morley (1995) report the within subject differences in speed of access to pain memories cannot be explained by a state dependence framework; instead they employ a schema based theory. A rapid response to pain situations would be advantageous in terms of psychobiology as pain is often a major threat to the individual's performance. An individual's response to pain is partly governed by the schematic processing of memories of previous pain experiences. The power of Wright and Morley's research is limited by the small sample size ($n = 11$), and a larger sample size may have allowed the detection of more between group differences. Further, their research was not a full replication of autobiographical memory research for other emotional problems. Wright and Morley did not examine the specificity of autobiographical memory recall, instead their enquiry was limited to the relative access to memories with pain

content. This research does not permit substantial comparisons of style of autobiographical memory recall in people with chronic pain and people with other emotional disturbances.

Wilhelm et al (1997) demonstrated autobiographical memory impairment in people with obsessive compulsive disorder (OCD). Accessing autobiographical memory requires effortful searching. Disorders characterised by intrusive cognitions such as OCD might produce deficits in memory retrieval. In line with research into people with combat related post traumatic stress disorder (PTSD) and autobiographical memory which showed deficits in retrieval of specific memories (McNally et al 1994), Wilhelm et al predicted that OCD would impair autobiographical memory as a result of intrusive cognitions consuming cognitive capacity, and their results confirmed this. Other trauma related problems have been shown to produce deficits in autobiographical memory retrieval. Kuyken and Brewin (1995) report depressed women with a history of childhood sexual abuse exhibited greater difficulty in retrieving specific memories than depressed women without a history of abuse. Wilhelm et al (1997) found OCD patients were significantly less specific in memory retrieval than their healthy control group. The OCD patients also took longer to retrieve specific memories when compared to the control group. However, OCD patients with a co-morbid diagnosis of major depressive disorder were less specific than OCD patients without major depressive disorder. This could suggest the tendency for generic memory recall observed in OCD patients was attributable to major depression and not the presence of OCD per se.

Wilhelm et al (1997) did not find association between childhood trauma in the form of physical or sexual abuse and autobiographical memory biases in adulthood. Childhood trauma may not inevitably result in a tendency to generic memory in adulthood. However, this conclusion is based on results from a small sub-group of the OCD patients in their wider research.

Generic memory recall has not been demonstrated in all emotional disorders. Two studies, Richards and Whittaker (1990) and Burke and Mathews (1992) failed to find a disruption to autobiographical memory recall in populations of people with clinical anxiety. Although anxious people showed the standard mood congruent effect in terms of preferential speed of retrieval of anxiety related memories, no study has demonstrated a tendency for generic memory recall in this population. Williams and Dritschel (1988) found this pattern of inconsistency in memory biases in anxiety with laboratory based episodic memory tasks (Williams and Dritschel 1988).

Causes of impairment to autobiographical memory

Clearly the use of generic memory per se is not indicative of problems, normal use of generic memory is adaptive and sufficient for most daily purposes (Williams 1996). Much of the time specific details or examples are not required. One might suspect that frequently experienced events become generic or summary memories. However, this is not a complete explanation for the observable phenomena. In tests of autobiographical memory, there are robust individual differences, with some participants responding to nearly

all the cue words with generic memories. It is unlikely that such people's lives are composed of a greater number of frequently experienced events than other people (Williams 1996). Studies on depressed groups have shown that they are as (or more) likely to retrieve generic memories to positive cue words (Williams and Broadbent 1986, Williams and Scott 1988). There is evidence that depressed people have more frequent negative life experiences than non-depressed people (Williams 1996). Therefore, on a frequency basis alone, depressed people may be expected to show a greater tendency to retrieve generic memories to negative more than positive cues, whereas as discussed the reverse is more often observed in research studies (Williams 1996). Groups of people with structural brain damage also display autobiographical memory recall deficits similar to people with emotional disorders, yet it is unlikely such observations can be attributed to higher frequency of the recalled memories in these specific groups. Lack of specificity has been observed in patients with frontal and right hemisphere damage (Williams 1996). Older people who scored low on a working memory test (sentence span) had difficulty generating specific memories (Williams 1996). These studies raise the possibility that emotional disturbance might be a functional analogue to structural damage of this nature. This is perhaps similar to 'pseudo-dementia' where depression results in dementia-like patterns of memory failure. It also shows that nonspecificity does not merely reflect the frequency of the recalled event (Williams 1996). Williams and Dritschel (1992) found only a modest and non-significant correlation between events recalled in the generic form and the frequency of such an event ($r(58) = .24; p = .06$).

Williams and Scott (1988) suggest two mechanisms to account for autobiographical memory biases in people with emotional disturbances. (i) deficits at the encoding level, a tendency to preferentially encode the general aspects of a situation; and (ii) retrieval deficits: a susceptibility to prematurely terminate a memory search at an intermediate (general) level. However, in later writings, Williams concedes these explanations are not sufficient to account for the full range of observed impairments to autobiographical memory recall (Williams 1996). Williams and Dritschel (1992) suggest that generic memories result from a failure of the supervisory attentional system (SAS). Such a failure means insufficiently distinct cues for memory searching are generated, resulting in commonalities rather than distinctions in events being abstracted. Williams and Dritschel (1992) predict that where the SAS fails, failures in specific memory will be characterised by generic rather than extended memories. Consistent with this prediction, Phillips and Williams (1997) found cognitive impairment in older people produces an excess of generic rather than extended memories. This tendency has also been observed in people with depression (Williams 1996). A further explanation for these biases in autobiographical memory recall draws on evidence that the tendency to generic memory retrieval is a developmental stage. A person may continue to use this early retrieval style as a way of controlling negative affect, avoiding recall of specific elements of unpleasant past events (Williams 1996). Children who experience negative events, perhaps go on to use a generic retrieval style in order to control affect. Consistent with this theory Kuyken and Brewin (1995), found of the 58

depressed women in their study 37 reported a history of childhood sexual or physical abuse. When those with and without histories of childhood abuse were compared, participants who reported childhood abuse retrieved more generic memories than the other participants. However, women who reported childhood abuse lacked specificity of memory recall across the board not just in relation to memories of the abuse.

Clinical implications of impairments to autobiographical memory

There are a number of clinical implications of these memory biases in people with emotional disturbances. It is unlikely a person will be aware they have these tendencies in memory recall. Yet, such tendencies may undermine the ability to employ memory in imagining a range of future alternatives and in using successful strategies to solve current interpersonal problems (Williams 1996). A bias away from recalling specific positive personal memories from one's past may mean that a person finds it very difficult to provide examples to justify positive personal attributes (Williams and Scott 1988). Such a tendency is likely to be important in terms of progress in a psychological therapy, but perhaps most important in cognitive therapies where clients are asked to provide evidence for and against their negative and positive beliefs. A client may state a belief that they are incompetent in some aspect, and with this type of memory bias, they may find it very difficult to provide a contradictory example of success or competence when asked to do so by the therapist.

Memories are also important in problem solving. Learning both from mistakes and successes is an important part of future problem solving. Being able to remember sufficient detail about positive and negative previous solutions to problems is an essential element to problem solving abilities. The process of remembering previous successful and failed strategies to solve problems is likely to be particularly significant for people with emotional disorders who perhaps face repeated problems of a similar nature. For example, a person who is increasingly depressed because they are unable to obtain a new job, will not be able to build upon the successes (and correct the failures) of previous job interviews if they have difficulty recalling the details of past occasions. Evans et al (1992) predicted a tendency to generic memory recall would lead to poor problem solving skills, as both the definition of the problem and the generation of alternative solutions requires adequate access to memory for past parallel experiences. Evans et al found a strong association between ineffective problem solving strategies and generic memory recall. Williams (1996) suggests problem solving is inhibited as depressed people attempt to employ non-specific memories to generate potential solutions. Williams (1992) offers the following example. A person is feeling depressed and lonely and tries to think what might make them happy. If the only memory retrieved is "being with my boyfriend", a generic description, this does not contain sufficient specific information to be helpful. Alternatively, the memory "last Friday when I went for a walk with my boyfriend, we met some friends and went for a drink". This specific event offers a much greater range of cues to possible solutions; "boyfriend", "walk",

“meeting other people”, “other friends”, “going for a drink” (Williams 1992 p.262).

Williams et al (1996) report that the construction of future scenarios depends largely on autobiographical memory retrieval of past similar events. In their study of suicidal patients, both past autobiographical memory recall and imagined future situations were consistently more generic than controls. For suicidal participants and non-suicidal controls, specificity of response for past memories and imagined future situations were correlated. It is argued that autobiographical memory biases affect problem solving abilities by interfering with the retrieval of past similar situations with sufficient information and balance between positive and negative events to produce successful alternative actions. Having a limited ability to imagine the future in a specific way will impair problem solving, and may be the process that turns life events into suicidal crises.

Although people with emotional disorders show a greater tendency to be generic for positive memories compared to negative memories, the overall tendency for both positive and negative memories is less specific compared to people without emotional difficulties. It would be more helpful if such people could remember in detail past negative events. Where the specifics of past negative events cannot be recalled, individuals might be led to believe such problems are insurmountable (Williams and Scott 1988). We may perhaps conclude that those who cannot accurately *remember* the past are condemned to repeat it. There is sufficient research evidence to support a

case for memory strategies to be included in psychological therapies for a number of emotional disorders.

Brittlebank et al (1993) followed up a group of people meeting DSM-III-R criteria for major depressive disorder, examining autobiographical memory function. Extent of generic memory recall at initial assessment predicted failure to recover at seven month follow up. A tendency for generic memory recall to positive cues at assessment predicted outcome and accounted for a third of the variance in depression at follow up. Furthermore, patients were divided into high and low generic memory recall on the basis of assessment scores. At follow up, only 1 of the 9 patients in the "high (generic recall) to positive cues" had recovered from depression, while 8 out of 10 patients who were "specific to positive cues" had recovered (Williams 1996). Williams (1996) further suggests a cognitive behavioural spiral may develop. People experiencing problem solving difficulties may experience negative situations as more pervasive and as a result develop greater helplessness and have less motivation to participate in activities that might help lift mood. Brittlebank et al (1993) suggest generic recall is a trait marker which can predict recovery from depression. Williams (1996) reports women seeking help for relationship problems with their children had difficulty telling the therapist the details of their children's problem behaviours. After a parent training programme, only those mothers whose descriptions had developed to be more detailed had an improved relationship with their children.

(vi) RATIONALE FOR THE STUDY

This research extends the body of literature into the role of autobiographical memory biases in various emotional disorders. An extensive literature search did not yield any research into alcohol problems and autobiographical memory. The clinical relevance of biases in autobiographical memory in other emotional disorders has been demonstrated, suggesting the potential importance of autobiographical memory in the assessment and treatment of alcohol problems. There are undoubtedly, many routes to developing an alcohol problem and equally at least as many ways recovery is impaired or relapse provoked. This research investigates the role which memory (and specifically deficits in autobiographical memory) may have in these processes.

All treatments for alcohol problems rely at some level on the memory of the client, whether that is taking a medical history or conducting a detailed psychological assessment and intervention. In this respect it is to the advantage of clinicians from any profession to be aware of the potential biases in the memory of clients. Therapists can understand a client's inability to be specific when requested to be so, as a clinical feature of the presenting problem not a deliberate attempt to frustrate the therapeutic process (Williams 1996).

In other emotional disorders, the tendency for generic autobiographical memory recall has been associated with poor problem solving skills and is

predictive of poor long-term outcome (Brittlebank et al 1993; Evans et al 1992). If autobiographical memory biases are a feature of alcohol problems interventions employed in other areas might be successfully extended to the treatment of alcohol problems. For example, clients keeping notes of events in diaries and referring back to them when necessary can increase specificity. Insight can be promoted by explaining memory biases to clients. A person who is aware of a tendency to generic recall and negative biases to memory can be encouraged to use cognitive challenging strategies for initial memories that are judged unhelpful. In essence a person can become aware that their memory may not always accurately represent the past and may be working against them at some level. Protraska and DiClemente (1992) have proposed a model of a spiral of change characterising levels of changes to addictive behaviours. In this model a relapse is conceptualised as a return to a previous stage in the change process, but with the positive element that the person has the previous experience to learn from and to help them return to the next stage. However, tendencies in autobiographical memory towards generic recall or negativity may hinder this process. An important area of relapse prevention therapy is the identification and planned management of high-risk situations. Images, situations or affective states may cue a high-risk situation. High-risk situations could potentially be cued by alcohol linked memories, or the affect induced by memories. Autobiographical memory in alcohol problems could form an important addition to relapse prevention and management therapies. Theories of autobiographical memory biases in people with PTSD and OCD propose that these conditions impair autobiographical memory as a result of intrusive cognitions limiting cognitive

capacity available for memory searching. Tiffany (1990) has suggested that substance urges and cravings are nonautomatic processes that consume cognitive capacity. In people with alcohol problems urges and cravings may represent a drain on cognitive resources leading to impairments in autobiographical memory. Tiffany (1990) also suggests that relapse can occur when cognitive capacity required to resist urges and cravings is employed on another task. An intrusive or trauma related memory could be a competing cognitive task.

(vii) CONTEXT OF THE PRESENT RESEARCH

This study is intended to address the following research questions.

1. Biases in autobiographical memory recall

Is the pattern of autobiographical memory biases found in people with depression and other emotional disturbances also found in people with alcohol problems, in terms of generic recall and latency? The specific hypotheses are; a) participants from the 'problem drinkers' group show a bias towards generic autobiographical memory recall to all cue words. b) The 'problem drinkers' are more likely to respond with a generic memory than the 'social drinkers' in response to positive cue words. c) 'Problem drinkers' show a longer latency to respond with a specific memory to all cue words. d) 'Problem drinkers' show a longer latency to respond to positive cue words

compared to 'social drinkers'. e) Autobiographical memories retrieved by participants from the 'problem drinkers' group are more likely to be subjectively rated as negative compared to the ratings given to memories by the 'social drinkers'. f) 'Problem drinkers' subjectively rate specific memories given in response to positive cues more negatively than 'social drinkers'.

2. Causes of autobiographical memory biases in 'problem drinkers'

In terms of looking at factors of the 'problem drinkers' which are associated with generic autobiographical memory recall it is predicted that, stronger current craving for alcohol as measured by the Alcohol Cravings Questionnaire (Now version) is correlated with recall of generic autobiographical memories. It is further hypothesised that degree of severity / chronicity of alcohol problems are associated with the tendency to recall generic autobiographical memories in 'problem drinkers'.

3. Autobiographical memory responses to alcohol cue words

Further examination will be made of responses to alcohol related cue words. It is hypothesised that a) Participants from the 'problem drinkers' group are more likely to produce generic memories to alcohol related cue words when compared with 'social drinkers', and that b) 'Problem drinkers' will show preferential access (in terms of speed of response) to specific memories in response to alcohol related cue words compared to non-alcohol cue words and the responses of the 'social drinkers'. c) For memories given in response to alcohol related cue words, it is predicted that the 'problem

drinkers' are more likely to subjectively rate these memories more positively than non-alcohol cue words compared with the 'social drinkers'.

4. Reported memory recalled when intoxicated

With regard to reports of memories retrieved when intoxicated with alcohol the specific hypotheses are, a) the reported memories of the 'problem drinkers' group are more likely to be generic compared to the 'social drinkers'. b) The reported memories recalled when intoxicated of the 'problem drinkers' are subjectively rated as more negative than the 'social drinkers'.

The role of memories recalled when intoxicated in influencing decisions to continue drinking will also be examined. In this respect it is predicted that c) for 'problem drinkers' generic memory recall is correlated with decision to continue drinking. d) For 'problem drinkers', the desire to continue drinking after recalling a memory is stronger than for 'social drinkers'. e) 'Problem drinkers' report a stronger desire to continue drinking after recall of a memory when intoxicated than when recalling the same memory when sober compared to 'social drinkers'.

5. Alcohol and subjective reported memory problems

This study will explore the role of alcohol consumption (and intoxication) in subjective reported memory problems. Particular attention will be paid to 'memory blackouts' following alcohol consumption, the inability to recall an

episode due to alcohol intoxication. The reported experiences of 'problem drinkers' and 'social drinkers' will be compared.

6. The role of memories in drinking behaviour

The study will also report on the reported role of memories in drinking behaviour, again comparing the relative experiences of 'problem' and 'social drinkers'. Specifically, it will explore whether participants report experiences of memories prompting them to drink more and / or drink less or stop drinking.

Chapter two: METHOD

(i) OVERVIEW

There were two groups of participants for this study, 'problem drinkers' and a 'social drinkers' comparison group. The 'problem drinkers' were recruited from two treatment services and the 'social drinkers' group were recruited from staff and contacts at a London hospital.

The data collection was interview based, with some interviewer administered measures and some self complete questionnaires. All interviews were conducted individually and in private. In addition to general demographic and drinking history questions the measures used covered alcohol use dependence and disorders, measures of anxiety and depression, a measure of pre-morbid intellectual functioning, current episodic memory function and an alcohol craving questionnaire. Autobiographical memory was assessed using the Autobiographical Memory Test (Williams and Broadbent 1986) which has been revised to include an additional category of cue words (neutral) and reducing the upper time limit allowed for recall from 60 to 30 seconds (Williams personal communication). Some alcohol related cue words were added after the main AMT, to assess autobiographical memory in response to alcohol cues. Participants were also asked about memories recalled when drunk and about personal experiences of the effects of alcohol consumption on memory and of memories on alcohol consumption.

At the conclusion of the data collection interview, all 'problem drinkers' were asked about their immediate desire to drink, to ensure they were not vulnerable to alcohol consumption as a result of the interview process.

(ii) SETTING

Participants from the 'problem drinkers' group were recruited from two centres, an outpatient alcohol treatment service and an inpatient detoxification ward. The second centre was added to increase the pace of data collection, as recruitment at the outpatient service was slower than anticipated. Participants from the 'problem drinkers' group were interviewed at the clinic they were attending or on the ward where they were an inpatient. Participants from the 'social drinkers' group were recruited from the staff group of a large London Hospital. Interviews with this group were mainly conducted in offices at this hospital. For the majority of participants from the 'social drinkers' group this was also their workplace.

(iii) PARTICIPANTS

Problem Drinkers: The 26 'problem drinkers' were recruited from two alcohol treatment services. Fifteen participants were recruited from an outpatient alcohol treatment service in central London. Eleven participants were recruited from a national inpatient detoxification ward. Participants from the

outpatient service were recruited by direct contact with the researcher while they were waiting for an appointment or by volunteering themselves to their clinician in response to posters. Participants from the inpatient ward were informed of the research at community meetings. The researcher subsequently approached all those who met the general inclusion criteria in person. One person from the outpatient service and two people from the inpatient ward declined to take part in the research.

The inclusion criteria for the 'problem drinkers' group were; (i) to be receiving treatment for alcohol problems, (ii) over 18 years old, (iii) no obvious psychotic symptoms, (iv) not having consumed any alcohol for at least 24 hours. All 'problem drinkers' were required to be free from alcohol withdrawal symptoms at the time of data collection. In practice this was operationalised differently in the two settings. In the outpatient setting participants had either achieved controlled drinking or were working towards (or had achieved) abstinence from alcohol and had been receiving treatment for at least one month. At the inpatient setting participants were in weeks two, three or four of a four-week programme, and had completed the detoxification stage as reported by nursing staff. Following admission in-patients are monitored daily for withdrawal symptoms using the CIWA-Ar (Clinical Institute Withdrawal Assessment – Alcohol, revised). Benzodiazepines are prescribed for between 5 and 10 days in response to symptoms as assessed by the CIWA – Ar. A typical starting dose is 40mgs qds reduced by 25% per day with a final dose of 10mgs nocte. The benzodiazepine used is chlordiazepoxide, a long acting benzodiazepine with a half-life of between 4

and 29 hours. All participants had completed this process when interviewed and were no longer taking benzodiazepines. Although chlordiazepoxide has a long half-life the established effects of benzodiazepines on memory are confined to learning new material (Curran 1991). For a period following an acute dose, benzodiazepines produce impairments of episodic memory retrieval of information learned prior to administration is not affected by benzodiazepines. Therefore participants performance on the AMT would not have been compromised by this medication. The early stages of a detoxification programme are likely to be too chaotic and distracting for meaningful data collection to take place. For example, Davidson and Ritson (1993) report a substantial decrease in the proportion of in-patient problem drinkers meeting the criteria for major depression after 10 – 14 days of abstinence.

Social Drinkers: The 29 participants in the 'social drinkers' group were recruited by poster from the staff group at a large London hospital or were friends or colleagues of other comparison group participants.

The inclusion criteria for the 'social drinkers' group were; (i) alcohol drinkers who had been drunk at least once, (ii) never having received treatment for alcohol problems, (iii) not having consumed alcohol for at least 24 hours before data collection. All 'social drinkers' were screened for unrecognised alcohol problems using the Alcohol Use Disorders Identification Test (AUDIT) questionnaire (Saunders et al 1993), and the Severity of Alcohol Dependence Questionnaire (SADQ) (Stockwell et al 1979).

All participants were asked to read a participants' information sheet (see appendix 1) before their signed consent was obtained (see appendix 2). Ethical approval for the research with 'problem drinkers' was granted by Camden and Islington Community Health Services NHS Trust Local Research Ethics Committee (see appendix 3) and the Bethlem and Maudsley NHS Trust & The Institute of Psychiatry Ethical Committee (Research). East London and the City Health Authority Research Ethics Committee gave ethical approval for the 'social drinkers' group.

Participants from the outpatient group and the 'social drinkers' group were given a £5 store voucher at the end of the interview to thank them for their time. Participants from the inpatient group were not given vouchers or any other reward for participation as this was against the policy of the organisation where recruitment took place.

(iv) MEASURES

Demographic Information and Drinking History

All participants were asked basic demographic information (e.g. age, occupation). Participants were asked a number of questions concerning their drinking history, e.g. age of onset of first drink. The 'problem drinkers' group were also asked for broad details about current and any previous treatment episodes for alcohol problems. Previous research has suggested these are

useful indicators of history of drinking behaviour and have some predictive value in terms of response to treatment (Plinius Maior Society 1994).

Rivermead Prose

The Rivermead Prose is a memory sub-test from the Rivermead Behavioural Memory Test. This was included as a measure of current episodic memory function. The interviewer reads a passage of prose containing 56 words covering 21 'idea units'. The participant is asked to recall as much as they can immediately after hearing the story and after a filled delay of about 20 minutes. The test is scored by awarding 1 point for each idea unit correctly recalled or ½ a point for ideas partially recalled. The maximum potential score is 42, 21 for each recall trial. A 'pass' score is recall of at least 6 'idea units' on immediate recall and at least 4 on delayed recall. A parallel version of this test was used in case any of the 'problem drinkers' had been exposed to the main version in clinical assessment.

Autobiographical Memory Test (AMT)

The procedure for the AMT is derived from the Galton cueing technique, as adapted by Lloyd and Lishman (1975), Crovitz (1975) and Robinson (1976). This technique has been widely used to assess personal event memory in people with emotional disturbances. For this research the extended version of Williams and Broadbent (1986) procedure was used with alcohol specific additions. The test comprised 18 cue words, 6 positive, 6 negative and 6 neutral (Brittlebank et al 1993). Participants were given the following instruction "*I am interested in your memory for events that have happened to*

you in your life. I am going to read you some words. For each word I want you to think of an event that happened to you which that word reminds you of. The event could have happened recently or a long time ago. It might be an important event or a trivial event. Just one more thing, the memory you recall should be of a specific event. So if I said the word 'GOOD' it would not be OK to say 'I always enjoy a good party', because that doesn't mention a specific event. It would be OK to say 'I had a good time at Jane's party on Friday'". There are three practice words, participants are prompted where appropriate to give specific events to all three before moving on to the test items. The interviewer reads each word aloud, and the participant describes the event recalled. A prompt ("*Can you think of a particular time*") is used if the first recalled memory is not specific. In response to the prompt the participant may demonstrate the original memory was of a specific event or may give a new response of a specific memory.

Following Phillips and Williams (1997) the first response to each cue word is scored as either omission (0), general (1), extended (2) or specific (3), producing a 'specificity score'. The general principle is, if the event took place over a period time lasting less than one day it is coded as specific. For example, the response 'when I row with my mum' would be coded as generic, the response 'last month when we had a blazing row' would be coded as specific. Specific events lasting more than a day (i.e. 'my holiday last year') are coded as extended. Previous research indicates the distinction between specific and general memories can be reliably made using these criteria, obtaining inter-rater reliabilities between 0.87 and 0.93

(Williams and Scott 1988). 20% of participants' responses (randomly selected in proportion from each of the two groups) were second rated by a rater blind to the 'problem drinker' / 'social drinker' group of the participant and blind to the ratings of the original rater. The standard autobiographical memory test responses, additional alcohol responses and memory recalled when intoxicated were included in the inter-rater reliability calculation. The proportion of agreement on ratings of memory type by the two raters for this study was 0.83 (Cohen's kappa). This figure is slightly below levels of agreement obtained in some previous research (0.87 - 0.93 (Williams and Scott 1988) but is within the range generally considered acceptable (Barker et al 1994).

Participants have 30 seconds in which to recall an event for each cue word. Time taken to recall first specific memory is recorded (regardless of whether it is the first memory produced) using a stopwatch (McNally et al 1994).

Timing starts as the interviewer finishes reading the cue word and time at first word of response is noted. Cumulative timing is used where participant's first response is not specific. This yields a 'latency to first specific memory score'. If the participant is not able to recall a specific memory a response time of 30 seconds is entered. When responses to all cue words have been collected, the participant is asked to rate the emotional valence of each specific memory (1 = "very unpleasant" to 5 "very pleasant"). Next, for each specific event, participants are asked to indicate how long ago it occurred (less than 1 week, less than 1 month, less than 3 months, less than 6 months, less than 1 year & more than 1 year).

The original version contains the cue word 'grass'. During piloting, participants reported withholding their first memory as it was connected with cannabis. This would potentially add to the latency of response, the word 'grass' was substituted for its counterpart ('pottery') from one of the parallel versions.

The cue words used were;

POSITIVE	NEGATIVE	NEUTRAL
happy	guilty	pottery
relieved	hopeless	gigantic
proud	failure	absence
eager	grave	wildlife
glorious	ugly	bread
sunny	worse	search

In addition to the original AMT cue words, some alcohol specific words were added. The alcohol specific words were inserted after the AMT words to preserve the AMT responses. The additional words were 3 state words (drunk, tipsy and sober), and 2 object words (pub and alcohol). Two further neutral object words were added (cinema and tea). The full AMT procedure was followed for these additional words. Memory responses to these cue words were included in the calculation of inter-rater reliability.

Spot the Word Test (STW)

This is a test to estimate pre-morbid intelligence. The test is based on lexical decisions. The test is comprised of a list of word pairs, for each pair one word is a real, low frequency, word and one is a non word (Beardsall and Huppert 1997). Participants were asked to cross out the non word for each pair. This test has several advantages over the National Adult Reading Test (NART). It does not require the participant to read aloud, a task some people may find anxiety provoking, it also overcomes any problems with testers' knowledge of pronunciation of unusual words. Scores on the STW correlate 0.80 with the NART.

Beck Anxiety Inventory (BAI)

The Beck Anxiety Inventory (Beck et al 1988) is a 21 item, self-report instrument designed to measure the severity of anxious symptoms. The instrument produces a score between 0 and 63, with a mean score in people with anxiety disorder of 23.49 (sd 12.39).

Beck Depression Inventory (BDI)

The Beck Depression Inventory (Beck et al 1979) is a 21 item self-report scale. Each item comprises 4 statements graded in intensity, reflecting depressive symptoms. Participants are asked to indicate one statement from each group of 4 which best describes their mood over the past week. The scale can be used as a screening instrument with non-psychiatric populations. The scale produces a score between 0 and 63, 0 – 9 is considered the normal range, 10 – 15 mild depression and a score above 30

suggests severe depression. The mean score for a sample of people with alcohol problems was 13.88 (sd 10.60), (Beck et al 1979).

Alcohol Use Disorders Identification Test (AUDIT)

The AUDIT questionnaire (Appendix 4) was developed from an international collaborative project as a primary care screening instrument for hazardous and harmful alcohol consumption (Saunders et al 1993). The 10 item questionnaire covers alcohol consumption, drinking behaviour and alcohol related problems. Responses for each question are scored from 0 – 4, giving a maximum possible score of 40. The majority of items have the following response options: 'never', 'monthly or less', '2- 4 times a month', '2 – 3 times a week', '4 or more times a week'. 92% of people diagnosed with harmful alcohol use score 8 or above, 94% of those with non-hazardous consumption score less than 8 (Saunders et al 1993). The AUDIT questionnaire was developed for early identification of hazardous and harmful alcohol consumption in primary care settings. It was included in this research primarily to screen the 'social drinkers' group for unrecognised alcohol problems. The 'problem drinkers' group were also asked to complete the AUDIT questionnaire for full comparison. The 'problem drinkers' group were asked to complete the questionnaire with regard to their pre-treatment drinking, to provide a pre-treatment measure. The 'social drinkers' comparison group were asked to complete the questionnaire with regard to their current drinking.

Severity of Alcohol Dependence Questionnaire (SADQ)

The SADQ (Stockwell et al 1979) (Appendix 5) consists of 20 items measuring various aspects of alcohol dependence syndrome. The questionnaire is divided into five areas; physical symptoms of withdrawal, affective symptoms of withdrawal, craving and relief drinking, typical daily consumption, and reinstatement of symptoms following a period of abstinence. Each item has four response choices in terms of frequency of symptom experience: 'never or almost never', 'sometimes', 'often' or 'always or nearly always'. The responses carry a score of 0,1,2,3 respectively, (Drummond 1990). The maximum total score is 60. A score equal to or less than 20 suggests 'low dependence', 21 – 30 'moderate dependence' and greater than 30 'high level of dependence' (Jarvis1995). The questions relate to a 'recent period of heavy drinking', participants are asked to nominate a particular month to remind them of this. For the 'problem drinkers' group, participants were asked to nominate 'a month in the six months before starting current treatment' to measure pre-treatment dependence. Participants from the 'social drinkers' group were asked to nominate 'a month during the last six months'. The SADQ was included in this research primarily to measure level of dependence in the 'problem drinkers' group, the 'social drinkers' group were also asked to complete this questionnaire. The SADQ has been found to be a reliable and valid instrument to measure alcohol dependence (Drummond 1990). A strong positive correlation between alcohol dependence (as measured by the SADQ) and alcohol related problems (as measured by the Alcohol Problems

Questionnaire), independent of the quantity of alcohol consumed, was found by Drummond (1990).

Alcohol Craving Questionnaire – Now Version (ACQ - Now)

The ACQ-Now (Appendix 6) contains 47 items and was developed to measure current craving for alcohol among alcohol users (Singleton et al 1994). The scale is divided into 6 further sub-scales; Urges and Desires to Use Alcohol, Intent to use Alcohol, Anticipation of Positive Outcome, Anticipation of Relief from Withdrawal or Negative Outcome, Lack of Control Over Use and Consistency. Each sub-scale contains approximately the same number of items. Participants respond by indicating how strongly they agree or disagree with each statement on a 7 point Likert scale with scores from 1 – 7. A higher score reflects stronger craving. At present there are no published norms available for this instrument. This measure has been developed from measures of craving for other substances (i.e. heroin) where it has been demonstrated to be robust. This measure has the advantage that it is derived from a model reflecting the complexity of craving.

Memory Recalled When Intoxicated

Each participant was asked to describe a memory they had experienced while drunk. Questioning and procedure followed closely the format of the AMT. *“I would like you to think of a memory or thought that has come back to you when you were drunk. This might have happened recently or a long time ago, it might have happened frequently or only once. It might be a memory of something important or something trivial.”* Time taken to recall

was recorded from the end of the above question, until the beginning of the participant's response. If more than 90 seconds elapsed, a no response and a latency of 90 seconds was recorded for this section. For participants who reported memories recalled when drunk, the following information was sought; time since (last) remembered when drunk, emotional valence of the memory (see AMT scale), how drunk when recalled (0% = 'as sober as I could be' to 100% 'as drunk as I could be'), "how much did the memory make you feel like having another drink" (0% "not at all" to 100% "impossible to resist") and frequency memory recalled when drunk (1 = 'rarely' to 5 = 'daily'). Participants were also asked how frequently the same memory is recalled when sober (0 = 'never' to 5 = 'daily'), "how much did the memory make you feel like having a drink" (0% "not at all" to 100% "impossible to resist") and "did you have a drink?". Memories were also rated for specificity following the same principles used for the AMT. These memories were included in the calculation of inter-rater reliability.

Personal Experience(s) of the Effects of Drinking Alcohol on Memory and Memories on Consumption of Alcohol

At the end of the interview each participant was asked a number of open ended questions to elicit personal experiences of the effects of alcohol on memory and the effects of memories on alcohol consumption. *"As you are aware, this research has asked about memory and drinking. What effects in yourself have you noticed of drinking on your memory?" "Have you ever noticed memories have affected your drinking, either leading you to drink*

more, or made you want to drink less or stop?" Participants were also asked about experiences of memory blackout after drinking alcohol.

(v) PROCEDURE

Participants from the outpatient 'problem drinkers' group and the 'social drinkers' group were seen for data collection at an appointment time arranged after a positive response to personal or poster recruitment. No participant failed to attend for an appointment. A small number of participants from both groups cancelled initial appointments but subsequently attended rescheduled appointments. Participants from the inpatient 'problem drinkers' group were generally seen for data collection immediately after personal recruitment.

Each participant was interviewed in private to facilitate greater confidentiality. The same interviewer interviewed and recruited all participants. After an initial introduction to the research, explanation of confidentiality and discussion of any questions, all participants completed a consent form. The data collection process began with basic demographic questions, followed by questions concerning the participant's drinking history. Participants then completed the immediate recall task of the Rivermead Prose. Each participant then completed a number of self complete questionnaires; Spot the Word, BAI and BDI. The interviewer remained present to answer any specific questions about the completion of these questionnaires and to

ensure full and complete responses. The completion of these questionnaires acted as the distraction activity before the delayed recall task of the Rivermead Prose. Participants next completed the AMT in full with alcohol specific additions, followed by the Memory Recalled when Intoxicated section. Both these sections are interviewer administered. Participants then completed three further self complete questionnaires; AUDIT, SADQ and ACQ-Now. Again the interviewer remained present. Finally the interviewer asked a range of open ended questions to elicit personal experiences of alcohol consumption affecting memory and memories affecting alcohol consumption.

Once the tasks were completed, all participants were given a further opportunity to ask questions or make comments. Once there were no further questions participants from the outpatient 'problem drinkers' group and the 'social drinkers' group were given a store voucher worth £5 to thank them for their participation. All participants from the 'problem drinkers' group were asked how they were feeling in terms of desire to drink. The process of talking in detail about alcohol consumption for a protracted period of time has the possibility of acting as a cue to desire to drink. None of the 'problem drinkers' group reported experiencing an increased need or desire to drink following the interview. All participants from the 'problem drinkers' group were reminded how to access support if it was required.

Chapter three: RESULTS

(i) PARTICIPANTS

Fifty-five people participated in this study, 26 (47.3%) participants in the 'problem drinkers' group and 29 (52.7%) participants in the 'social drinkers' comparison group. Participants for the 'problem drinkers' group were recruited from two centres, an outpatient treatment service (n = 15, 57.7% of 'problem drinkers' group) and an in-patient detoxification ward (n=11, 43.3% of 'problem drinkers' group).

Demographic details

Age: The average age of the 'problem drinkers' group was 42.7 years (sd 8.8, range 23 – 55 years), the average age of the 'social drinkers' group was 33.6 years (sd 8.5, range 23 – 62). The 'problem drinkers' were significantly older ($t = -3.8$, $df = 53$, $p = .0001$). *Sex:* The 'problem drinkers' group consists of 20 (76.9%) men and 6 (23.1%) women, the 'social drinkers' group consists of 18 men (62.1%) and 11 women (37.9%). The difference in sex distribution between the two groups was not significant ($\chi^2 = 1.4$, $df = 1$, $p = .23$ ns). *Marital status (See Table 1):* Twelve (46.2%) of the participants from the 'problem drinkers' group had a current partner ('In a relationship' or 'Married or living as if married'), 21 (72.4%) participants from the 'social drinkers' group had a current partner. The 'social drinkers' group were more likely to have a current partner ($\chi^2 = 3.9$, $df = 1$, $p = .047$).

Table 1. Marital status of 'problem drinkers' and 'social drinkers' groups.

Marital Status	'Problem drinkers'	'Social drinkers'
Single	10 (38.5%)	6 (20.7%)
In a relationship	7 (26.9%)	6 (20.7%)
Married or living as if married	5 (19.2%)	15 (51.7%)
Separated	1 (3.8%)	0
Divorced	2 (7.7%)	2 (6.9%)
Widowed	1 (3.8%)	0

Employment: A greater number of participants from the 'problem drinkers' group were currently unemployed, 22 (84.6%) compared to 1 (3.4%) of the 'social drinkers'.

Pre-morbid Intelligence

Spot the Word: The average number of errors on the Spot the Word test for the 'problem drinkers' group was 10.8 (sd 6.3, range 0 – 22 errors) and 6.2 (sd 4.1, range 0 – 16 errors) for the 'social drinkers' group. This difference reflecting higher pre-morbid intellectual functioning for the 'social drinkers' group was significant ($t = 3.3$, $df = 53$, $p < .002$).

Current Memory Function: On the measure of current memory functioning (Rivermead Prose), there was a trend but no significant difference between the performance of the two groups on immediate recall, 'problem drinkers' average number of ideas recalled 7.9 (sd 3.0) and 9.5 (sd 3.1) for the 'social drinkers' group, ($t = 1.95$, $df = 53$, $p = .06$ ns). A significant difference between the two groups was found on the delayed recall section of the measure, 'problem drinkers' average recall of 7.3 (sd 2.8) ideas, 'social drinkers' 9.2 (sd 2.9) ideas ($t =$

2.48, $df = 53$, $p = .017$). A pass / fail result can also be obtained from the performance on the immediate and delayed recall tasks. One person from the 'social drinkers' group failed the Rivermead prose, 5 'problem drinkers' failed. *Mood*: On the mood measures, the 'problem drinkers' were significantly more depressed and significantly more anxious than the 'social drinkers' group. *Anxiety*: The average BAI score for the 'problem drinkers' group was 18.8 (sd 12.4, range 3 – 45), for the 'social drinkers' group the average score was 5.7 (sd 3.9, range 0 – 16) ($t = 5.4$, $df = 53$, $p < .0001$). *Depression*: For the BDI, the average score for the 'problem drinkers' was 19.5 (sd 10.8, range 3 – 42), average score for the 'social drinkers' was (sd 4.8, range 0 – 16), ($t = 7.4$, $df = 53$, $p < .0001$).

(ii) DRINKING HISTORY

There were a number of differences between the 'problems drinkers' and the 'social drinkers' groups on measures of drinking history. *Age consumed first drink containing alcohol*; Participants from the 'social drinkers' group, reported consuming their first drink containing alcohol at a younger age (see Table 2). Average age of first drink containing alcohol for the 'social drinkers' group 10.5 years (sd 3.9), for the 'problem drinkers' group 13.4 years (sd 5.8). This difference was significant ($t = -2.2$, $df = 53$, $p = .04$). As a crude estimate of length of drinking history the number of alcohol drinking years was calculated by subtracting age of first drink from current age. The 'problem drinkers' had a significantly longer drinking history than the 'social

drinkers', mean number of drinking years, 29.31 (sd 10.59) for the 'problem drinkers' and 23.28 (8.46) for the 'social drinkers' ($t = -2.35$, $df = 53$, $p = .023$). This difference should be considered in the light of the significantly older age of the 'problem drinkers' group. For the 'problem drinkers', percentage of drinking years subjectively reported as problem drinking years was calculated. The mean percentage of drinking years that were problem drinking years for the 'problem drinkers' was 53.21% (range 3.03% - 100%).

Table 2. Drinking history reported by 'problem drinkers' & 'social drinkers'.

Variable	'problem drinkers'		'social drinkers'		t-test (53)
	Mean (sd)	Range	mean (sd)	Range	
Age first drink (years)	13.4 (5.8)	2 – 31	10.5 (3.9)	4 – 17	-2.2*
Last drinking episode (days ago)	36.6 (71.3)	1 – 365	1.9 (1.4)	1 – 7	2.6**
Units of alcohol consumed	11.8 (11.1)	1 – 42	3.7 (3.2)	1 – 16	3.8***
Longest time without drink (wks)	45.5 (57.2)	1 – 260	31.4 (72.5)	1 – 312	0.79 ns
Drinking years	29.31 (10.59)	9 – 47	23.28 (8.46)	9 - 48	-2.35*
% problem drinking years	53.21 (31.94)	3.03 - 100	n/a	n/a	

* $p < .05$, ** $p < .01$, *** $p < .001$

Last alcohol drinking episode; the 'social drinkers' group consumed their last drink containing alcohol significantly more recently (see Table 2), on average 1.9 days ago (sd 1.4) compared with 36.6 days ago (sd 71.3) for the 'problem drinkers' group, ($t = 2.6$, $df = 53$, $p = .01$). This difference is attributable to the number of participants from the 'problem drinkers' group who reported abstinence from drinking alcohol as part of their current treatment, 21 of the 26 participants. The 'problem drinkers' group reported a greater average

consumption of alcohol for last drinking episode, 11.8 units (sd 11.1) with an average of 3.7 units for the 'social drinkers' (sd 3.2), ($t = 3.8$, $df = 53$, $p = .001$) (see Table 2). *Longest period without a drink containing alcohol;* The two groups did not report a significant difference in the longest period of time without consuming a drink containing alcohol (see Table 2). Average longest 'dry' period for the 'problem drinkers' group was 45.5 weeks (sd 57.2) and for the 'social drinkers' group was 31.4 weeks (sd 72.5), ($t = .79$, $df = 53$, $p = .43$ ns). The number of women in the 'social drinkers' group may have influenced this result. Many of these women reported spontaneously that their longest time without a drink containing alcohol was during a pregnancy. The period of time reported by the 'problem drinkers' group participants is likely to have been influenced by periods of abstinence in previous treatments.

Standardised Alcohol Measures

In terms of the standardised measures of alcohol use disorders and alcohol dependence, the 'problem drinkers' group scored significantly higher on both measures as might be anticipated (see Table 3).

Average AUDIT score for the 'problem drinkers' was 31.5 (sd 7.2) and for the 'social drinkers' group was 8.7 (sd 4.8), ($t = 14.1$, $df = 53$, $p = .001$). All participants from the 'problem drinkers' group scored above the cut off for 'hazardous drinking' (8 – 10) (Saunders et al 1993). For the SADQ, the average 'problem drinkers' score was 35 (sd 10.9), with an average of 2.1 (sd 2.3) for the 'social drinkers' group. The 'problem drinkers' group showed

significantly more alcohol dependence ($t = 15.9$, $df = 53$, $p = .001$). In terms of level of dependence, 16 'problem drinkers' scored in the 'high dependence' range, 7 in the 'moderate dependence' range and 3 in the 'low dependence' range (61.5%, 26.9% and 11.5% respectively). The highest score from the 'social drinkers' group was 9 out of 60, lower than the lowest score of 15 from the 'problem drinkers group'.

Table 3. Standardised alcohol measures for 'problem' and 'social' drinkers groups.

Variable	'problem drinkers'		'social drinkers'		t –test (df 53)
	Mean	(sd)	Mean	(sd)	
AUDIT score	31.5	(7.2)	8.7	(7.4)	14.1***
SADQ score	35	(10.9)	2.1	(2.3)	15.9***
ACQ Scores:	(n=25)		(n=29)		
TOTAL ACQ	117.7	(45.8)	87	(35.1)	2.8**
Sub-scales;					
- Urges and desires to use alcohol	19.4	9.9	13.5	7.4	2.5*
- Intent to use alcohol	17.9	8.5	19.1	10.0	.463 ns
- Anticipation of positive outcome	20.5	10.6	20.9	9.4	.151 ns
- Anticipation of relief from withdrawal	25.3	15.3	14.4	7.2	3.4**
- Lack of control over use	30.6	12.2	14.1	5.6	6.5***

* $p < .05$, ** $p < .01$, *** $p < .001$

For measures of current alcohol craving (ACQ), the 'problem drinkers' group showed significantly more overall current craving for alcohol than the 'social drinkers' group. The average total alcohol craving score for the 'problem

drinkers' was 117.7 (sd 45.8), with the 'social drinkers' scoring an average of 87 (sd 35.1), ($t = 2.8$, $df = 52$, $p = .01$) ($n = 54$, data missing for one participant from the 'problem drinkers' group). Table 3 details results for the two groups for the sub-scales of the ACQ.

As can be seen from Table 3 the 'problem drinkers' group displayed significantly greater craving for alcohol on three of the five sub-categories, Urges to use alcohol, Anticipation of relief from withdrawal and Lack of control over use. On the remaining two categories, intent to use alcohol and anticipation of positive outcome, the 'social drinkers' scored higher, but neither group difference was significant.

(iii) TREATMENT RELATED MEASURES ('problem drinkers' group only)

The 'problem drinkers' were asked to identify retrospectively when they believed they had first started to have a drink problem. The average reported length of time since start of drink problem was 14.5 years (sd 10.2, range 1 to 34 years). Nineteen 'problem drinkers' reported at least one previous episode of treatment for alcohol problems, 10 from the outpatient group and 9 from the in-patient group. The average number of previous episodes of treatment was 4 (sd 4, range 1 to 15). On average these participants first received treatment for alcohol problems 6.7 years ago (sd 5.5, range 1 to 18 years). Nine of the outpatient group had previously been an in-patient for

alcohol detoxification, 7 of the in-patient group reported a previous episode of in-patient detoxification.

In terms of current episode of treatment, the outpatient group had been engaged in present treatment for an average of 33.9 weeks (sd 41.1). The in-patient group had been in present treatment for an average of 1.9 weeks (sd 0.9). Direct comparisons between the two groups on this factor are not appropriate as the two treatment packages are very different. The outpatient service provides on-going input, in some cases following in-patient detoxification. The in-patient service is a treatment package lasting 4 weeks. (For a description of the in-patient treatment regime refer to the methods section)

Of the 15 participants from the outpatient group, 10 people reported their current treatment goal was abstinence and 5 reported their goal was 'controlled drinking'.

Comparisons between Outpatient and In-patient groups

There were no observed significant differences between the in-patient and outpatient groups on various demographic and drinking related measures (see Table 4). The outpatient group consists of 13 men and 2 women, the in-patient group consists of 7 men and 4 women.

Table 4. Comparisons between outpatient and in-patient groups.

Measure	Outpatients (n=15)		In-patients (n=11)		t-test (df 24)
	Mean	(sd)	Mean	(sd)	
Age (years)	42.2	(9.4)	43.3	(8.4)	0.3 ns
Age first drink	12.9	(3.6)	14	(8.11)	0.48ns
BAI	20.3	(14.2)	16.8	(9.7)	0.64 ns
BDI	20.6	(12.3)	18.1	(8.8)	0.58 ns
SADQ	34.2	(11.7)	36.1	(10.1)	0.73 ns
Total ACQ	127.4	(54.6)	105.3	(29.3)	0.11 ns

*p<.05, **p<.01, ***p<.001

The average age of the outpatient group was 42.2 years (sd 9.4), and of the in-patient 43.3 years (sd 8.4) ($t = .301$, $df = 24$, $p = .77$ ns). The average reported age of first consumption of a drink containing alcohol was 12.9 years old (sd 3.6) for the outpatient group and 14 years old (sd 8.1) for the in-patient group ($t = .483$, $df = 24$, $p = .63$ ns). In terms of mood measures, the out-patient group was slightly more anxious and depressed than the in-patient group, BAI, outpatient mean 20.3, (sd 14.2) compared with in-patient mean of 16.8, (sd 9.7). BDI, outpatient mean 20.6 (sd 12.3) compared with in-patient mean of 18.1, (sd 8.8). Neither of these differences were significant (BAI – $t = .69$, $df = 24$, $p = .5$ ns; BDI – $t = .58$, $df = 24$, $p = .57$ ns). On measures of alcohol dependence and current alcohol craving, the two groups again showed no significant differences. The average outpatient SADQ score was 34.2 (sd 11.7) and the in-patient average was 36.1 (sd 10.1) ($t = .73$, $df = 24$, $p = .67$ ns). The average total craving scale scores were, 127.4 (sd 54.6) for the outpatient group and 105.3 (sd 29.3) for the in-patient group ($t = .011$, $df = 24$, $p = .24$ ns).

(iv) STANDARD AUTOBIOGRAPHICAL MEMORY TEST

All participants from both groups provided a memory (generic, extended or specific) to the majority of the 18 cue words of the standard AMT. All participants gave at least one non-specific memory. For the purposes of analysis, the number of first memories recalled by each participant in response to the 18 cue words that were Omissions, Generic, Extended and Specific was calculated. This gives a frequency score for each participant for the four memory types. The maximum potential score for each memory type is therefore 18 per participant. In practice, no participant responded to all 18 cue words with the same type of first memory. In addition, the number of each type of first memory response (omission, generic, extended and specific) for the three cue word valences (positive, negative and neutral) was calculated, giving a score out of 6 for each valence. Table 5 details the frequency of types of first memory recalled to the 18 cue words for the two groups.

Types of first memory response

The frequencies for type of first memories recalled not fully satisfy the criteria for ANOVA, the distributions are negatively skewed with a high number of zero frequencies for each of the four categories. Non-parametric Mann – Whitney tests were used. As Table 5 shows, the ‘problem drinkers’ and ‘social drinkers’ produced significantly different mean numbers of first memories for each category except omissions. The ‘problem drinkers’ responded with more first memories that were generic and less first

memories that were specific than the 'social drinkers'. These differences are not attributable to the 'problem drinkers' having more difficulty in producing a memory *per se*. There was no significant difference between the two groups in number of omissions (i.e. failure to produce any memory to a cue word).

Table 5. Frequencies of types of first memory response to all cue words.

Memory type	'problem drinkers'		'social drinkers'		Mann – Whitney U
	Mean (sd)	Range	Mean (sd)	Range	
Omission	2.15 (2.64)	0 – 11	1.13 (1.21)	0 – 5	Z = -1.0 ns
Generic	5.88 (3.77)	0 – 14	2.72 (2.19)	0 – 8	Z = -3.2*
Extended	0.81 (0.85)	0 – 3	0.41 (0.78)	0 – 3	Z = -2.1*
Specific	9.15 (3.67)	3 – 17	13.72 (2.31)	8 – 17	Z = -4.4***

*p<.05, **p<.01, ***p<.001

The maximum potential number of responses for each memory type is 18.

The 'problem drinkers' did recall significantly more first memories that were extended than the 'social drinkers'. However, this may be of limited meaning as the numbers of extended memories produced in total was small, and the largest amount of extended first memories recalled by any participant from both groups was 3. Williams and Dritschel (1992) found that the lack of specificity of autobiographical memory recall in depressed suicidal patients was "wholly due to categoric (generic) memories" (p. 391). They concluded extended memories were of limited importance in emotional disturbance, and that generic and extended memories were qualitatively different types of error.

Recall of generic first memories

Although the frequencies of first memory recalled do not fully satisfy the criteria for ANOVA the following data has been analysed using the MANOVA statistic as the most appropriate available statistic. The data is negatively skewed and has a high number of zero frequencies for each of the categories for both groups, transformations did not produce more normally distributed data. Analysis of Variance is considered a robust statistical procedure in so far as Type I errors are concerned, discrepancies are more likely to be of a conservative rather than a liberal nature. Howell (1997) suggests the assumption of normal distribution can be violated where distributions are of a similar shape, e.g. both negatively skewed, as is this case with this data. Further, the data is in line with the criteria for ANOVA in other respects, namely having homogeneity of variance in each group, relatively equal and large sample sizes (Howell 1997; Sawilowsky and Blair 1992). The significant main effects are also backed up by non-parametric chi-squared tests.

Using a 2 x 3 (group by cue word valence) mixed analysis of variance, did not show a significant group x valence interaction ($F(2,52) = 0.69$, ns) on number of generic first memories for the cue word valences. A significant main effect of group was shown ($F(1,53) = 14.07$, $p < 0.0001$) ($\chi^2 = 24.64$, $df = 11$, $p = 0.01$). The two groups differ significantly on the number of first memories recalled that were generic (see Table 6). The 'problem drinkers' were more generic in first memory response to all cue word types. There

was also a main effect of valence ($F(2,52) = 4.48, p < 0.02$), with all participants producing significantly different numbers of generic first responses across the cue word valences ($\chi^2 = 28.92, df = 4, p < 0.001$, positive cues; $\chi^2 = 25.40, df = 5, p < 0.001$, negative cues; $\chi^2 = 19.95, df = 5, p = 0.001$, neutral cues). The largest difference was between first responses to positive cue words (summed mean 2.3) and negative cue words (summed mean 3.4). Participants produced more generic first memories to negative cue words.

Table 6. Number of generic first responses by cue word valence.

Group	Cue Word Valence		
	Positive	Negative	Neutral
	Mean (sd)	Mean (sd)	Mean (sd)
'problem drinkers'	1.54 (1.45)	2.31 (1.57)	2.12 (1.63)
'social drinkers'	0.76 (1.02)	1.10 (1.08)	0.97 (1.05)

The maximum potential number of responses for each cue word valence is 6.

Latency to specific memory response

Time taken to respond to cue word with a specific memory (regardless of whether this was first memory recalled or recalled after prompt) was analysed using a 2 x 3 (group x cue word valence) mixed analysis of variance (see Table 7). There was no significant group x valence interaction ($F(2, 52) = 0.21, ns$). Analysis showed a significant main effect for group as the 'problem drinkers' took longer to retrieve specific memories to cue words ($F(1, 53) = 17.72, p < 0.0001$). There was no main effect of valence,

response latency to specific memory did not depend on cue word valence ($F(2, 52) = 1.51, ns$).

Table 7. Latency (seconds) to respond with specific memory across cue word valence.

Group	Cue Word Valence		
	Positive	Negative	Neutral
	Mean (sd)	Mean (sd)	Mean (sd)
'problem drinkers'	18.96 (6.95)	19.30 (5.49)	18.43 (5.59)
'social drinkers'	13.33 (5.15)	14.55 (4.56)	13.20 (4.39)

Subjective valence of recalled specific memory

Table 8. details the subjective valence ratings of recalled specific memories, (1= 'very unpleasant – 5 = 'very pleasant'). A 2 x 3 (group by cue word valence) showed a significant group x cue word valence interaction ($F = (2, 51) = 5.56, p < 0.01$). The 'problem drinkers' gave higher subjective valence ratings to specific memories recalled to positive cue words compared to the 'social drinkers' (group means 4.38 & 4.13 respectively). The 'problem drinkers' also gave lower subjective valence ratings to negative cue words compared to the 'social drinkers' (group means 1.49 & 1.98 respectively). No significant effect of group was demonstrated ($F(1, 52) = 1.61, ns$). There was no significant difference between the groups in the subjective ratings of the specific memories recalled. However, there was a main effect of cue word valence ($F(2, 51) = 248.61, p < 0.0001$). Not surprisingly all participants

gave a higher subjective valence rating to specific memories recalled in response to positive cue words, followed by neutral and negative cue words in that order.

Table 8. Subjective valence ratings across cue word valences.

Higher score = more positively rated

Group	Cue Word Valence		
	Positive	Negative	Neutral
	Mean (sd)	Mean (sd)	Mean (sd)
'problem drinkers'	4.38 (5.56)	1.49 (0.45)	3.18 (0.82)
'social drinkers'	4.13 (0.57)	1.98 (0.54)	3.24 (0.56)

Factors associated with recall of generic autobiographical memories

From the specific hypotheses for this study and the general autobiographical memory literature the association between number of generic first memories recalled and the following variables was calculated.

Age; Given the significant difference in age between the two groups, the correlation between age and number of generic first memories recalled was calculated. There was no significant correlation between age and number of generic first memories for the 'problem drinkers' ($r = 0.17$, $p = 0.42$ ns). The correlation between age and generic first memories was significant at the 0.05 level for the 'social drinkers', with greater age being associated with a higher number of generic first memories ($r = 0.40$, $p = .03$, two tailed).

Craving; There was no significant correlation between number of generic first memories recalled to standard AMT cues and total craving score as measured by the ACQ -Now questionnaire for either group ('problem drinkers': $r(25) = 0.03$, $p = 0.90$ ns / 'social drinkers': $r(29) = -0.12$, $p = 0.55$ ns).

Estimated pre-morbid intelligence; For the 'problem drinkers' group there was significant correlation between estimated pre-morbid intelligence (Spot the Word Test, error score) and number of first recalled memories that were generic. Higher STW scores (lower estimated pre-morbid intelligence) was correlated with more generic first memories recalled ($r(26) = 0.40$, $p = 0.04$, two tailed). These factors were not correlated for the 'social drinkers' group ($r(29) = -0.13$, $p = 0.51$ ns). Estimated pre-morbid intelligence, however, only accounts for 16% of the variance of generic first memory responses for the 'problem drinkers'.

Current episodic memory functioning; Current episodic memory functioning was measured with the Prose sub-test of the Rivermead Behavioural Memory Test. For the 'problem drinkers' there was no significant correlation between number of first memories recalled that were generic and score for the Rivermead Prose immediate recall, ($r(26) = -0.02$, $p = 0.92$ ns) and the delayed recall ($r(26) = 0.03$, $p = 0.88$ ns). Similarly there were no significant correlations with these factors for the 'social drinkers'; ($r(29) = 0.08$, $p = 0.67$ ns) and ($r(29) = 0.05$, $p = 0.81$ ns) respectively.

Depression; Scores from the Beck Depression Inventory were not correlated with number of generic first memories recalled for either group. 'Problem

drinkers' ($r(26) = -0.04, p = 0.60$ ns) and 'social drinkers' ($r(29) = 0.29, p = 0.51$ ns).

Alcohol consumption and problem measures associated with recall of generic autobiographical memories

(Note: The following section only considers data from 'problem drinkers')

The hypotheses for this study make a number of predictions regarding associations between alcohol consumption and problem factors and tendency towards recall of generic autobiographical memories for 'problem drinkers'. Table 9. shows the correlations between recall of generic memories and alcohol related measures.

Table 9. Correlations between number of generic first memories recalled and alcohol related measures for 'problem drinkers'.

Alcohol related measure	<i>r</i>	<i>p</i>
Age 1st drink	0.31	0.12 ns
Drink problem first noticed	-0.08	0.70 ns
SADQ Total	-0.03	0.88 ns
ACQ – Urges sub scale¹	-0.14	0.52 ns
ACQ – Intent sub scale¹	0.12	0.56 ns
ACQ – Anticipation sub scale¹	0.05	0.80 ns
ACQ – Relief from withdrawal sub scale¹	0.02	0.94 ns
ACQ – Lack of control sub scale¹	0.05	0.82 ns
Number of drinking years	-0.03	0.88 ns
% Problem drinking years	-0.02	0.92 ns

¹ n = 25 for all ACQ scores.

None of the hypothesised alcohol related variables were significantly correlated with the tendency to retrieve generic first memories among the 'problem drinkers'.

Another obvious difference between the 'problem drinkers' and the 'social drinkers' is the factor of treatment. Being in treatment, particularly an in-patient admission, could be considered a life event that may be distressing or distracting and could have an effect on autobiographical memory performance. If this were the case, one might expect a negative correlation between time in treatment and number of generic first memories recalled, those more recently entering treatment retrieving more generic first memories. Although the correlation was in the predicted direction, this did not even approach significance at the 0.05 level, suggesting treatment as an event does not significantly influence the results ($r = -0.01$, $p = 0.95$ ns).

(v) AUTOBIOGRAPHICAL MEMORY RESPONSES TO ALCOHOL CUE WORDS

Autobiographical memory responses of the two groups to alcohol cue words (drunk, sober, tipsy, alcohol and pub) were compared to responses from 2 added non-alcohol words (cinema and tea) and the responses to 3 randomly selected words from the main Autobiographical Memory Test (guilty, hopeless and absence). As the maximum potential number of responses for each of the two cue word factors (alcohol and non alcohol) is 5, calculating

the frequencies of omissions, generic, extended and specific memories (as with the standard AMT) is likely to yield some very small numbers. A different procedure was used. For each participant two 'specificity ratings' were calculated for the two cue word types (following the procedure of Williams et al 1996), where an omission was given a score of 0, generic = 1, extended = 2 and specific = 3. The 'specificity rating' is calculated by summing the responses using these scores across the two cue word types. A higher score reflects greater specificity.

Specificity of first memory recalled to alcohol or non-alcohol cue words

In examining specificity of first memory recalled to alcohol and non-alcohol cue words a 2 x 2 (group x cue word type) mixed analysis of variance was used (see Table 10). There was no significant group x valence interaction ($F(1,53) < 0.01$, $p = 0.95$ ns). Analysis did produce a highly significant main effect of group ($F(1, 53) = 19.35$, $p < 0.0001$). The 'problem drinkers' gave more generic first memory responses to both alcohol and non-alcohol cue words, following the pattern found for responses to the standard AMT (group means: (problem) 10.89 & (social) 13.31 for alcohol cue words and (problem) 10.15 and (social) 12.52 for non-alcohol cue words). There was no significant main effect of cue word type, although there was a trend towards more generic first memories to non-alcohol cue words ($F(1, 53) = 2.88$, $p = 0.09$ ns).

Table 10. Specificity rating of first memory recalled to alcohol and non-alcohol cues. (*Higher scores = greater specificity*)

Group	Cue Word Type	
	Alcohol	Non-alcohol
	Mean (sd)	Mean (sd)
'problem drinkers'	10.89 (2.61)	10.15 (3.64)
'social drinkers'	13.31 (1.81)	12.52 (2.15)

Maximum potential specificity score per cue word type is 15

Latency to respond with specific memory to alcohol and non-alcohol cue words

Table 11 shows the time taken to respond with a specific memory to alcohol and non-alcohol cue words regardless of whether specific memory was first memory or after prompt. A 2 x 2 (group x cue word type) mixed analysis of variance did not show a significant group x cue word type interaction ($F(1, 53) = 0.69, p = 0.41$ ns). There was, however, a highly significant main effect for group ($F(1, 53) = 14.10, p < 0.0001$). Participants from the 'problem drinkers' group were slower in responding with a specific memory to both alcohol and non-alcohol cue words. There was no significant main effect of cue word type ($F(1, 53) = 2.16, p = 0.15$ ns). Participants had similar latencies to respond with a specific memory to alcohol and non-alcohol cue words.

Table 11. Latency (seconds) to respond with specific memory to alcohol and non-alcohol cue words.

Group	Cue Word Type	
	Alcohol Mean (sd)	Non-alcohol Mean (sd)
'problem drinkers'	16.95 (5.10)	17.45 (7.45)
'social drinkers'	11.58 (4.57)	13.39 (4.50)

Subjective valence ratings of specific memories recalled in response to alcohol and non-alcohol cue words

Subjective valence ratings for specific memory responses to alcohol and non-alcohol cue words were calculated as with the standard AMT (see above).

Using a 2 x 2 (group x cue word type) mixed analysis of variance there was no significant group x cue word type interaction ($F(1, 52) = 0.18, p = 0.68$ ns). There was a significant main effect of group ($F(1, 52) = 7.11, p = 0.01$) (see Table 12). The 'social drinkers' group rated specific memories in response to alcohol and non-alcohol cue words more positively than the 'problem drinkers' group. A significant main effect of cue word type was also shown ($F(1, 52) = 19.19, p < 0.0001$). Both groups rated specific memories to alcohol cues more positively than non-alcohol cues.

Table 12. Subjective valence ratings of specific memories recalled in response to alcohol and non-alcohol cue words.

Group	Cue Word Type	
	Alcohol	Non-alcohol
	Mean (sd)	Mean (sd)
'problem drinkers'	2.78 (0.73)	2.42 (0.78)
'social drinkers'	3.27 (0.64)	2.81 (0.70)

Higher score = more positive subjective rating.

(vi) REPORTED MEMORY RECALLED WHEN INTOXICATED

In total 9 participants were unable to report a memory they had recalled while intoxicated with alcohol within the 90-second limit. The results in this section are based on the responses of 46 participants ('problem drinkers' n = 23, 'social drinkers' n = 23).

Specificity of memory recalled

Table 13 details the frequencies of the types of reported memory recalled when intoxicated. No participants reported an extended recalled memory. This may be more of an artefact of the questioning procedure than any other factor. The distribution of reported types of memory recalled are similar, with the 'problem drinkers' again showing a greater tendency towards generic memories.

Table 13. Memory recalled while intoxicated with alcohol; memory type, latency and subjective valence.

	Group	
	'problem drinkers'	'social drinkers'
Memory type: (freq.)		
Generic	14 (60.9%)	12 (52.2%)
Specific	9 (39.1%)	11 (47.8%)
Latency: (seconds)	29.62 (sd 23.08)	36.13 (sd 31.09)
Subjective valence:	2.13 (sd 1.52)	2.39 (sd 1.31)

Latency to report (any) memory recalled when intoxicated

The 'problem drinkers' and the 'social drinkers' did not differ on their latency to report a memory recalled when intoxicated. The mean response time of the 'problem drinkers' (29.62 seconds, sd 23.08) was slightly faster than the 'social drinkers' (36.13 seconds, sd 31.09), but this was not significant ($t(52) = 0.86, p = 0.39$ ns). (See Table 13).

Subjective valence of reported memory

The two groups did not differ significantly on the subjective valence of the reported memory recalled. The 'problem drinkers' gave an average subjective valence of 2.13 (sd 1.52) and the 'social drinkers' gave an average subjective valence of 2.39 (sd 1.31), ($t(44) = 0.63, p = 0.54$ ns). [Scale = 1 – 5, higher value = more positive rating]. (See Table 13).

Frequency of recalling memory when intoxicated, degree of intoxication and desire to continue drinking

The two groups did not report a significant difference in the degree of intoxication when the memory was recalled (see Table 14). As this was a subjective rating of intoxication, perhaps the responses are relative to the individual's usual degree of intoxication. There may have been an objective difference in degree of intoxication between the two groups. The 'problem drinkers' reported recalling the same memory significantly more frequently when intoxicated than the 'social drinkers'. The 'problem drinkers' also reported recalling this memory more frequently when sober than the 'social drinkers', however this difference only approached significance at the $p < 0.05$ level (see Table 14). In terms of desire to continue drinking, the 'problem drinkers' report a significantly stronger desire to continue drinking when intoxicated and to start drinking when sober when this memory was recalled compared to the 'social drinkers' (see Table 14). More participants from the 'problem drinkers' group (21, 91.3%) reported having an additional drink when this memory was recalled when intoxicated than participants from the 'social drinkers' group (10, 43.5%).

Table 14. Frequency of recalling memory when intoxicated, degree of intoxication and desire to continue drinking.

Variable	Group		t-test
	Mean (sd)	Mean (sd)	
Degree of intoxication	61% (23.84)	36.13% (31.09)	(df 44) -0.29 ns
Desire to drink when intoxicated	65.61% (36.53)	10.22 (21.72)	(df 44) -6.25***
Desire to drink when sober	31.75% (34.84)	6.11% (15.10)	(df 36) -2.89**
Frequency recalled when drunk	2.78 (1.7)	1.65 (0.98)	(df 44) -2.76**
Frequency recalled when sober	2.3 (1.69)	1.48 (1.38)	(df 44) -1.82 ns

*p<.05, **p<.01, ***p<.001

Desire to drink after recalling memory when intoxicated and sober

With the 'problem drinkers', neither subjective valence of the reported memory recalled when intoxicated nor the specificity of the memory recalled were correlated with whether or not the participant went on to consume another drink containing alcohol, (subjective valence; $r(23) = 0.18, p = 0.41$ ns; generality of memory recalled; $r(23) = 0.07, p = 0.76$ ns).

Using a 2 x 2 (group by intoxicated or sober) mixed analysis of variance, a significant group x state interaction was shown ($F(1, 36) = 6.76, p = 0.01$). The 'problem drinkers' reported a stronger desire to drink when intoxicated than when sober compared to the 'social drinkers'. A significant main effect of group was also shown ($F(1, 36) 39.68, p < 0.0001$), with the 'problem drinkers' having a stronger desire to drink after recalling the memory whether intoxicated or sober (see Table 14). A significant main effect of state (intoxicated or sober) was also shown with all participants having a stronger

desire to drink after recalling the memory when intoxicated (summed group means 37.9% compared with 18.9%).

Although the content of the reported memory recalled when intoxicated was not specifically analysed, the distressing nature is clear in many of the recalled memories reported by the 'problem drinkers'. *"remembering thinking about jumping in the canal, it was very unpleasant and very strong"; "it was an old farm house, we were setting the wallpaper on fire, fire engines and the police arrived and we got arrested"; "I get sentimental about my daughter and cry in my beer about her"; "not seeing my kids grow up, I miss that, it escalates the drinking"; "I was there when my father died, that came back to me this last relapse"; "I remember things I blank out when I'm sober, mostly abusive negative memories"*.

Interestingly one of the 'problem drinkers' gave the following example; *"I was wandering back from the pub, I found myself giving a perfect rendition of a poem I'd learned by heart and thought I'd forgotten"*.

(vii) SUBJECTIVE REPORTS OF EFFECTS OF ALCOHOL
CONSUMPTION ON MEMORY FUNCTION

Structured open-ended questions were used to enquire into the subjective experiences of participants regarding memory problems following alcohol consumption.

Most commonly experienced effect

Without any specific prompt, participants were asked to report their most commonly experienced effect on memory following alcohol consumption. (12 participants did not respond to this area of questioning, 5 from the 'problem drinkers' group and 7 from the 'social drinkers' group). Table 15 reports the respective frequencies of problems reported of the two groups. Overall the types of problems reported by the two groups are relatively similar.

Table 15. Reported effects on memory function following alcohol consumption.

Reported effect	Group	
	'problem drinkers' (n = 21)	'social drinkers' (n = 22)
Blackouts	8 (38.1%)	8 (36.4%)
Failure – names	4 (19%)	2 (9%)
Failure – events	6 (28.6%)	6 (27.3%)
Retrograde amnesia	1 (4.8%)	0
'other'	2 (9.5%)	6 (27.2%)

Experience of memory blackouts

A memory blackout was operationalised as a period of time for which the participant was unable to independently remember anything that took place following alcohol consumption. Partial memory failure was excluded.

Twenty-two of the 'problem drinkers' (91.7%, n=24) reported having experienced at least one period of memory blackout. This compared with 17 (60.7%, n = 28) of the 'social drinkers'. Just over one third more of the 'problem drinkers' had experienced a memory blackout following alcohol consumption. Notably, the overwhelming majority of 'problem drinkers' reported experiences of memory blackouts following alcohol consumption.

Participants who reported memory blackouts were asked to estimate the lifetime frequency of blackouts. As this is likely to be a very crude estimate, four frequency categories were used for data analysis, (only 1, < 6, 6 – 10, > 10) although participants were asked to provide their own raw estimate, (see Table 16).

Table 16. Estimated lifetime frequency of blackouts.

Frequency	Group	
	'problem drinkers' (n = 22)	'social drinkers' (n = 17)
1 only	2 (9.1%)	6 (35.3%)
Less than 6	1 (4.5%)	4 (23.5%)
6 to 10	0	1 (5.9%)
More than 10	19 (86.4%)	6 (35.3%)

The reported frequencies suggest a difference in the experiences of the two groups. While the 'problem drinkers' are very much concentrated at the upper end of the reported frequencies, the 'social drinkers' appear to be distributed at both ends of the scale, perhaps indicating some difference of

experience within the group. The low level (i.e. more than 10) of the highest category perhaps disguises the true experience of some of the 'problem drinkers'. Some of the 'problem drinkers' group verbatim responses to questions of frequency reflect the high number of memory blackouts; "*a couple of times a week*"; "*half the time*"; "*nearly all the time*"; "*80% - it goes with the territory*"; "*as often as daily when I'm drinking heavily*".

Longest period of memory blackout

The 'problem drinkers' group reported a mean longest period of memory blackout of 32.43 hours (sd 73.43), while the mean period reported by the 'social drinkers' was 2.71 hours (sd 2.71), this difference was not statistically significant ($t(36) = -1.66, p = 0.11$ ns). This result is perhaps a consequence of the non-normal distribution of the data for both groups.

Description of longest period of memory blackout

Participants were asked to describe the circumstances of the longest period of memory blackout experienced. Although, not being able to remember the events of an entire evening was the most frequently reported circumstance by both groups, the wider variety of the reported circumstances of the 'problem drinkers' suggests different experiences of the two groups (see Table 17).

Table 17. Circumstances of longest period of memory blackout.

Circumstance	Group	
	'problem drinkers' (n = 22)	'social drinkers' (n = 17)
Not remembering getting home	3 (13%)	5 (27.8%)
Not remembering entire evening	7 (30.4%)	9 (50%)
“Woke up somewhere unknown”	3 (13%)	1 (5.6%)
“Woke up in Police Cell”	1 (4.3%)	0
“Woke up in hospital”	0	1 (5.6%)
‘other’	7 (30.4%)	1 (5.6%)

Some of the personal accounts of long memory blackouts perhaps reflect the qualitatively different experiences of the ‘problem drinkers’; *“in a pub in Perth. Me and my friend had quite a bit of money. I woke up 2 or 3 days later in a bed and breakfast”*; *“people would ask ‘good night last night?’, I wouldn’t remember no matter how much you reminded me”*; *“I beat up my wife, in the morning I asked her ‘who beat you up’, I had no idea”*; *“one minute it was September the next October, I didn’t believe it was October”*; *“I came ‘round, I thought it was Tuesday, but it was Saturday, I thought they were having me on”*.

Participants’ social responses to memory blackout

Participants were asked about their actions when faced with explaining the period of memory blackout. Of the ‘problem drinkers’ group 6 (27.3% n = 22) participants said they generally admitted they could not remember the events

because of a drink related blackout. This compares to 11 (68.8% n = 16) of the 'social drinkers' who reported they generally admitted to having experienced a drink related memory blackout. The majority (14, 63.6%) of the 'problem drinkers' reported their response to questioning would depend on who was asking them. Of these 14 participants 11 (78.6%) said if they did not admit to a memory blackout the story they 'invented' would generally have a 'neutral' content.

Both groups reported similar patterns of emotional response to realizing they had experienced a memory blackout (see Table 18).

Table 18. Reported emotional response to experience of memory blackouts after alcohol consumption.

Emotional response	Group	
	'problem drinkers' (n = 21)	'social drinkers' (n = 17)
Accept it / not bothered	2 (9.5%)	0
Negative feeling	12 (57.1%)	9 (52.9%)
Positive feeling / funny	2 (9.5%)	3 (17.6%)
Embarrassed	5 (23.8%)	5 (29.4%)

(viii) SUBJECTIVE REPORTS OF THE EFFECTS OF MEMORY ON ALCOHOL CONSUMPTION.

Memories prompting alcohol consumption

Almost twice the proportion of 'problem drinkers' (78.3%, n = 23) reported being aware of memories prompting them to start (or continue) drinking alcohol, compared to 'social drinkers' (40.7%, n = 27). Participants who felt memories had at some time prompted them to drink were further asked about the nature of these memories. Table 19 shows the general nature of memories reported as prompting alcohol consumption.

Table 19. Reported nature of memory prompting alcohol consumption.

Nature of memory	Group	
	'problem drinkers' (n = 18)	'social drinkers' (n = 11)
Negative life events	15 (83.3%)	5 (45.5%)
Positive life events	0	3 (27.3%)
Negative drinking memories	1 (5.6%)	0
Positive drinking memories	1 (5.6%)	3 (27.3%)
'other'	1 (5.6%)	0

As Table 19 shows, almost all the 'problem drinkers' reported memories of negative life events were likely to prompt them to drink more. The seriousness of some of these negative life events can be seen in some of the examples provided by the 'problem drinkers'; *"my childhood was very difficult, it's always in my head..... Drink, that's how I face the world"; "if I*

was already drinking, it would make me feel like drinking more to camouflage the negative feelings”; “anniversaries, like my father’s death, make me want to drink more”; “memories of leaving my son, I drink to null the pain”; “two of our crew got hit by a wire, dead, it was the first time I’d seen human brain”.

Memories prompting less alcohol consumption

From the ‘problem drinkers’ group, 11 participants (47.8%, n = 23) said they had experienced memories which had prompted them to drink less or stop.

A similar proportion off the ‘social drinkers’ also reported experiencing memories that prompted them to drink less or stop, 12 (42.9%, n = 28). The proportion of ‘problem drinkers’ reporting memories prompting them to drink less is somewhat smaller than the proportion who report memories which prompt them to drink more. The proportion of ‘social drinkers’ who report memories prompting them to drink less and drink more a very similar. Table 20 shows the nature of memories participants reported prompting them to drink less.

Table 20. Reported nature of memory prompting less alcohol consumption.

Nature of memory	Group	
	‘problem drinkers’ (n = 11)	‘social drinkers’ (n = 12)
Negative life events	2 (18.2%)	1 (8.3%)
Positive life events	2 (18.2%)	1 (8.3%)
Negative drinking memories	7 (63.6%)	7 (58.3%)
Positive drinking memories	0	1 (8.3%)
‘other’	0	2 (16.7%)

There appears to be more similarity in the nature of reported memories prompting less alcohol consumption between 'problem drinkers' and the 'social drinkers', compared with the responses to questions about memories which prompt more alcohol consumption.

Memories and alcohol treatment programmes

Participants from the 'problem drinkers' group were asked if memories had made it difficult for them to keep to any aspect of treatment programmes. A small number of the 'problem drinkers' group, 7 (30,4%, n = 23) said they had experienced problems with treatment programmes as a result of memories.

Chapter four: DISCUSSION

The results of this study will first be discussed in relation to the specific hypotheses and research questions posed. Findings are then discussed in the context of other literature on alcohol problems and autobiographical memory in emotional disturbances. The clinical implications of the findings of this study are then drawn out before proposing how research in the area of personal memories and alcohol problems might be taken forward.

(i) BIASES IN AUTOBIOGRAPHICAL MEMORY RECALL IN 'PROBLEM DRINKERS'

The main aim of this study was to explore autobiographical memory biases with a 'problem drinking' population. An extensive literature search showed this was an unstudied area to date. In the context of cognitive theories of alcohol problems and treatments for alcohol problems, an understanding of the role of such biases in a 'problem drinking' population is potentially important.

Overall, several significant differences between the 'problem drinkers' and the 'social drinkers' performance on the Autobiographical Memory Test were found. These indicate 'problem drinkers' exhibit similar biases in autobiographical memory function as those found in other clinical populations of people with emotional disturbances (e.g. depression, OCD, PTSD). In

response to all cue words the 'problem drinkers' showed a different pattern of types of first memory response compared to the 'social drinkers'. The 'problem drinkers' showed the predicted tendency towards recall of generic memories, producing more first memories that were generic and less first memories that were specific than the 'social drinkers'. 'Social drinkers' showed the reverse tendency. The differences between the groups is not attributable to greater memory failure problems in the 'problem drinkers', as the two groups did not differ significantly on the number of omissions to cue words, (i.e. being unable to provide any memory to the cue word within the time limit).

Both 'problem drinkers' and 'social drinkers' were found to respond with more generic memories to negative cue words than positive cue words. This tendency is considered in previous research on autobiographical memory as a 'normal bias' (Williams and Scott 1988). In studies of other emotional disorders, clinical populations have shown an increased tendency to recall generic memories in response to positive cues, a reversal of the normal pattern. Although the 'problem drinkers' were more generic in response to positive cues than the 'social drinkers', this difference was not significant. Moreover, the 'problem drinkers' did not show the predicted tendency to be more generic to positive compared to negative cues. The trend of differences of generic first memory response to positive and negative cue words did not differ significantly between the two groups.

Examination of the latency with which participants respond to cue words gives an indication of the relative ease of access to memories prompted by different cue word valences. Faster access is assumed to indicate preferential retrieval of a memory. The results show 'problem drinkers' were generally slower to retrieve all specific memories than 'social drinkers'. This suggests 'problem drinkers' experience more difficulty accessing specific memories. Taken along with the results indicating preferential recall of generic first memories this adds additional support to the hypothesis that 'problem drinkers' experience a bias towards recall of generic memories at two levels: first, type of initial memory accessed and second, ease of accessing specific memories. No main effect of valence on response latency was shown. Response latency did not depend on cue word valence; participants showed similar mean response latencies for all three cue word valence types. There was no significant interaction of group with cue word valence. The hypothesis that 'problem drinkers' are slower to respond with specific memories to positive cue words compared to 'social drinkers' is therefore not supported.

Subjective ratings of the emotional valence of recalled specific memories are not an aspect previously studied specifically in autobiographical memory research. However, within a cognitive framework there are sound theoretical reasons for adding this factor. Objectively a word may be rated as positive, negative or neutral; however, the subjective emotional experience is of interest in terms of understanding the cognitive process underlying behaviour. It is possible that a person may recall a subjectively positive

memory in response to a negative cue word and vice versa. Cognitive theories indicate people with emotional disturbances, (e.g. depression) are likely to exhibit overly negative thinking compared to people without such a disorder and that this distortion is important in the person's approach to everyday events and their situation. In this study there was no significant difference between the 'problem drinkers' and the 'social drinkers' in subjective ratings to specific memories recalled to all cue words. The hypothesis that 'problem drinkers' rate all specific memories more negatively than 'social drinkers' is not tenable. Indeed, there was a significant interaction of group with cue word valence. 'Problem drinkers' subjectively rated specific memories recalled in response to positive cue words more positively than 'social drinkers'. Furthermore, 'problem drinkers' also rated specific memories in response to negative cue words more negatively than 'social drinkers'. Compared to 'social drinkers', 'problem drinkers' exhibited a pattern of subjective valence ratings tending towards the extremes. This perhaps, parallels the concept in cognitive theories of 'all or nothing thinking' in depression. As might logically be expected, there was a significant difference in all participants' responses across cue word valences. Participants gave more positive ratings to specific memories to positive cue words compared with responses to negative cue words.

(ii) POTENTIAL CAUSES OF AUTOBIOGRAPHICAL MEMORY BIASES
IN 'PROBLEM DRINKERS'

Tiffany's (1990) theory that nonautomatic, effortful cognitive processes control alcohol urge responding leads to the hypothesis that higher craving state could be at least partly responsible for the demonstrated autobiographical memory biases. If higher levels of current craving are assumed to be consuming greater amounts of available cognitive resources, there would be less remaining cognitive capacity to be engaged in the process of specific memory recall, leading to a pattern of generic memory recall. While 'problem drinkers' did show greater levels of current alcohol craving in comparison to 'social drinkers', (overall and on three of the five sub-scales), there was no significant correlation between higher craving scores and lack of specificity of first memory response for either the 'problem drinkers' or the 'social drinkers'. The hypothesis that higher craving state is associated with reduced specificity of memory recall in 'problem drinkers' is therefore not supported by the present results.

Deficits in current episodic memory functioning might logically be expected to be a potential factor in the observed lack of specificity of memory recall in the 'problem drinkers' group. The 'problem drinkers' did exhibit a greater degree of deficit to current episodic memory function as measured by the Prose sub-test of the Rivermead Behavioural Memory Test. On the immediate recall test, there was a trend but no significant difference between the two groups, with 'problem drinkers' performing less well than the 'social drinkers'. On the

delayed recall test, there was a significant difference between the performance of the two groups, with the 'problem drinkers' showing a greater deficit. Indeed, five participants from the 'problem drinkers' obtained scores across the two conditions sufficient for the whole test to be considered as failed, representing a substantial problem in episodic memory functioning. One 'social drinker' also obtained a fail result to the overall test. However, there was no significant correlation between generic memory response and scores from the immediate and delayed conditions of the memory test for either the 'problem drinkers' or the 'social drinkers'. Generic memory recall in 'problem drinkers', does not seem to be associated with poor current episodic memory functioning.

The 'problem drinkers' group were more depressed than the 'social drinkers'. This finding replicates a number of studies into the co-morbidity of alcohol problems and depression (e.g. Davidson and Ritson 1993). Given the wealth of previous research that demonstrates autobiographical memory biases in people with depression (e.g. Moore et al 1988; Kuyken and Dalgleish 1995, Williams 1996) it is legitimate to ask if the observed autobiographical memory biases shown in the present research are due to depression in the 'problem drinkers' rather than a factor associated with alcohol problems. In the present research there was no significant correlation between depression as measured by the BDI and generic memory recall for either the 'problem drinkers' or the 'social drinkers'. Group differences in generic memory recall were not associated with levels of depression on the BDI.

The only measure that showed a significant correlation with generic memory recall in the 'problem drinkers' was estimated pre-morbid intelligence.

Estimated pre-morbid intelligence was not correlated with generic memory recall in the 'social drinkers'. However, for the 'problem drinkers' estimated pre-morbid intelligence only accounted for 16% of the variance in generic memory recall.

There are established associations between age and impairment of specificity of autobiographical memory (Phillips and Williams 1997; Williams 1996). In the light of the significant age difference between the 'problem drinkers' and the 'social drinkers', with the 'problem drinkers' being older, the effect of age was explored. There was no significant correlation between age and number of generic first memories recalled for the 'problem drinkers'.

There was however, a positive significant correlation between age and number of generic first memories recalled for the 'social drinkers', with greater age being associated with more generic first memories. The associations between age and decreased autobiographical memory specificity in previous research have been attributed to assessed cognitive impairment (Phillips and Williams 1997) and measured deficits in working memory (Williams 1996). Given the correlation between age and decreased specificity was found in the 'social drinkers' rather than the 'problem drinkers' it is unlikely the greater average age of the 'problem drinkers' influences the results of this study.

The hypothesis that degree of severity / chronicity of alcohol problems are correlated with lack of specificity of memory recall was not supported by the present data. Measures of current alcohol craving, alcohol dependence and chronicity of alcohol problems were not correlated with a tendency towards generic memory response for the 'problem drinkers'. There are no established standardised measures of history / chronicity of alcohol problems. Instead, questions such as age first consumed a drink containing alcohol and length of time alcohol drinking has been a problem are used (Plinius Maior Society, 1994). These questions are unsophisticated and have no testable psychometric properties; responses can be very subjective and rely heavily on retrospective reporting. A more robust measure of alcohol problem history / chronicity could potentially reveal a significant effect of alcohol problems on lack of specificity of autobiographical memory recall.

That the data does not reveal an association between any alcohol measures and degree of generic memory response is disappointing. However, this mirrors findings in studies with people with depression, where to date research has failed to find an association between severity of depression and impairment of specificity of autobiographical memory (Phillips and Williams 1997; Kuyken and Brewin 1995; Williams and Dritschel 1988).

(iii) AUTOBIOGRAPHICAL MEMORY RESPONSES TO ALCOHOL CUE WORDS

None of the cue words from the standard AMT have any alcohol connotations. Again, working within a cognitive framework, preferential or differential access to alcohol related memories could have clinical significance. At a crude level, preferential access to positive alcohol related memories might cloud judgements about the benefits and drawbacks of further alcohol consumption. Theoretically, solving day to day problems, or maintaining abstinence or controlled drinking could be influenced by biased memory recall of previous comparable situations. Additionally, if the findings from the standard AMT with 'problem drinkers' in this study are to be considered robust, there should be similarities in observed biases in what is essentially a separate but comparable test.

As with the standard AMT, 'problem drinkers' did produce more generic first responses to the additional alcohol and non-alcohol cue words compared with the 'social drinkers'. This difference was highly significant. However, there was no significant effect of cue word type. Participants did not respond differently in terms generic memories to alcohol as compared with non-alcohol cue words. There was a trend towards generic memories to non-alcohol cue words. If alcohol / non-alcohol cue word type is considered comparable to cue word valence, this result is in contrast to the standard AMT result which showed a significant main effect of valence for generic response. Analysis of responses to alcohol and non-alcohol cue did not

show a significant interaction of group with cue word type. The hypothesis that 'problem drinkers' will show a greater frequency of generic first memory responses to alcohol cue words is not supported by the results of the present study. In fact, the 'problem drinkers' were marginally more specific in their responses to alcohol cues compared to their responses to non-alcohol cues. This is also in line with the results from the standard AMT, where no significant interaction of group with cue word valence was shown.

In terms of latency to respond with a specific memory, some further results comparable with the standard AMT were found. A highly significant main effect of group was shown. As with the standard AMT, 'problem drinkers' were slower to respond with a specific memory to the additional alcohol and non-alcohol cues. However, participants responded to the alcohol and non-alcohol cue words with similar latencies. There was no main effect of cue word type, just as there was no main effect of cue word valence in the standard AMT. Again as with the latency results to the standard AMT, there was no significant interaction of group with cue word type. This means the hypothesis that 'problem drinkers' have preferential access (in terms of latency) to specific memories in response to alcohol cue words is not supported.

For subjective valence ratings of specific memories to the additional alcohol and non-alcohol cue words, the 'social drinkers' rated the specific memories significantly more positively than the 'problem drinkers'. This is in contrast to the results for the standard AMT, where no main effect of group was shown

for subjective ratings of specific memories recalled. Interestingly, both groups rated specific memories to alcohol cues more positively than non-alcohol cues. This result is similar to that of the standard AMT where a significant main effect of valence was found for subjective ratings to specific memories. Although the 'problem drinkers' subjectively rated specific memories in response to alcohol cues more positively than non-alcohol cues, there was no significant interaction of group with cue word type. For 'problem' and 'social drinkers', alcohol related words cued more positively rated specific memories than non-alcohol words. The present data does not support the hypothesis that 'problem drinkers' subjectively rate specific memories to alcohol cue words more positively than non-alcohol cue words compared with the 'social drinkers'. This is in contrast to the result from the standard AMT where a significant interaction of group with cue word valence was shown.

In summary, there were a number of results from the additional alcohol / non-alcohol cue word test which add further weight to the robustness of the findings for the standard AMT for this clinical population. Additionally, the responses of the 'problem drinkers' to alcohol related cue words show some novel patterns.

(iv) REPORTED MEMORY RECALLED WHEN INTOXICATED

As anticipated, more 'problem drinkers' than 'social drinkers' reported a generic rather than specific memory recalled when intoxicated, demonstrating a difference between the groups. Both the 'problem drinkers' and the 'social drinkers' also reported more generic than specific memories recalled when intoxicated, showing a within groups difference. The difference between number of generic and specific memories reported by the 'social drinkers' was smaller than for the 'problem drinkers' group. The 'problem drinkers' did subjectively rate reported memory recalled when intoxicated more negatively than the 'social drinkers', although this difference was not significant. In terms of a reported memory recalled when intoxicated, the two groups did not show any marked differences. 'Problem drinkers' again showed a tendency for more generic memory responses, but with regard to subjective valence there was no robust difference.

Of more interest is role of a memory recalled when intoxicated in decisions to continue drinking. That is, are memories important in the decisions of 'problem drinkers' to have another drink? 'Problem drinkers' appear to be more troubled by repeatedly recalling the same memory when intoxicated compared to the 'social drinkers'. Reported frequency of recall of this memory when intoxicated was significantly higher for the 'problem drinkers'. There was also a trend for the 'problem drinkers' to recall this memory more frequently when sober than the 'social drinkers', although this difference was not significant. Compared to the 'social drinkers' the 'problem drinkers' report

a significantly stronger desire to continue drinking when intoxicated and to start drinking when sober after recall of this memory. Furthermore, more 'problem drinkers' report actually following this desire through into having an additional drink than 'social drinkers'.

Lack of specificity of the reported memory recalled when intoxicated was not correlated with decision of 'problem drinkers' to continue drinking, in contrast to predictions. As predicted, the 'problem drinkers' did show a significantly stronger desire to continue drinking after recall of the memory than the 'social drinkers'. For both groups desire to continue drinking after recall of this memory was stronger when intoxicated than when sober, indicating a state effect on desire to drink following recall of this memory. The 'problem drinkers' also report a significantly stronger desire to continue drinking after recall of the memory when intoxicated than their desire after recalling the same memory when sober compared to the 'social drinkers'. It would seem a process of 'double disadvantage' is in operation. Not only do 'problem drinkers' experience stronger desire to continue drinking after recall of this memory than 'social drinkers', but that desire is even stronger when intoxicated than when sober.

Overall, the nature of the reported memory recalled when intoxicated was not dissimilar between the two groups, in terms of generic memory responses and subjective valence. Of potentially more clinical significance are the reported differences in behavioural and cognitive responses to this memory. Of particular interest is the stronger desire on the part of 'problem drinkers' to

continue and or start drinking after recall of this memory, and also their different response in terms of being more likely to actually follow this desire through to additional drinking behaviour.

(v) SUBJECTIVE REPORTED EFFECTS OF ALCOHOL
CONSUMPTION ON MEMORY

The overall reported effects on memory of alcohol consumption and intoxication were largely similar. Both groups in roughly similar proportions reported blackouts, failure of memory in terms of names and in terms of events. However, more specific enquiry into the experience of memory blackouts following alcohol consumption revealed differences in the experience of the two groups. Of the 'problem drinkers' who responded to this section, the overwhelming majority reported having experienced memory blackouts. Although the proportion of 'social drinkers' who reported memory blackouts after alcohol consumption was high, the figure for 'problem drinkers' was over one third greater. Looking at frequency of memory blackouts after alcohol consumption shows further differences. As one would expect, 'problem drinkers' reported a much higher lifetime occurrence of memory blackouts than 'social drinkers'. The duration of memory blackouts also reveals a strikingly different pattern between the two groups. The mean longest reported period of memory blackout for the 'problem drinkers' was 11 times longer than that reported by the 'social drinkers'. Reports of blackouts lasting in excess of a day were not uncommon in the 'problem drinkers'

group, whereas the no one from the 'social drinkers' reported a memory blackout even approaching half the duration of the average for the 'problem drinkers'. At the extreme, some 'problem drinkers' reported blackouts for longer than a week, including experiences of finding themselves in different towns and areas of the country and not knowing how they got there. Taken together, the high proportion of 'problem drinkers' who experienced memory blackouts, the high lifetime frequency of blackouts and the often chronic duration indicates memory blackouts are a prominent feature of alcohol problems. The verbatim responses of participants are testimony to the almost 'occupational hazard' nature of blackouts for 'problem drinkers'. *"I knew alcohol was doing it (causing blackouts), just became part of the whole thing". "Didn't really worry me, there were other drinkers around, it happened to them too". "Embarrassed, I used to be years ago, I'm used to it now"*.

'Problem drinkers' also reported a stronger tendency to cover up for occasions of memory blackout. A much smaller proportion of 'problem drinkers' reported being willing to admit to having had a blackout after drinking than 'social drinkers'. Where stories needed to be invented, 'problem drinkers' reported these tended to have a neutral content, perhaps to avoid being found out in their confabulation. This may reflect a wider series of actions required to conceal problem drinking.

Although a high number of 'social drinkers' reported experiencing blackouts following alcohol consumption, on almost every level, prevalence amongst

the group, frequency, duration and consequence, the experience of memory blackouts for 'problem drinkers' was more substantial.

(vi) THE ROLE OF MEMORIES IN PROMPTING INCREASED OR DECREASED ALCOHOL CONSUMPTION

Almost double the proportion of 'problem drinkers' compared to 'social drinkers' reported an awareness of starting or continuing drinking having been prompted by a memory. The vast majority of 'problem drinkers' who reported a memory prompting increased alcohol consumption cited memories of negative life events as the nature of such memories. Interestingly, no 'problem drinkers' reported increased drinking to have been prompted by positive life events, whereas this was feature reported by a few 'social drinkers'.

For memories prompting less or a cessation of drinking, there was much less of a difference between the two groups. The proportion of participants who reported being aware of memories having a decreasing effect on drinking was very similar across the two groups. Additionally, the nature of the reported memories, which prompted reduced drinking across the two groups, is very similar. For both groups, negative drinking memories were by far and away the most common reported memories prompting reduced alcohol consumption.

If the two groups are compared across memories prompting more and memories prompting less alcohol consumption, some interesting differences can be noted. A much larger proportion of the 'problem drinkers' reported experiencing memories that prompted them to drink more than prompted them to drink less. However, among the 'social drinkers' the proportion who reported experiencing memories that prompted them to drink less and drink more was very similar. It would seem, in terms of the role of memories in prompting increased drinking behaviour, 'problem drinkers' have a different experience than 'social drinkers', whereas the experience between the two groups on memories prompting less alcohol consumption is more similar. This could reflect a different role of memories prompting increased rather than reduced alcohol consumption or it could reflect a different process of attribution of drinking behaviour between the 'problem drinkers' and 'social drinkers'.

Seven 'problem drinkers' (30.4%, n= 23) said at some point memories had made it difficult for them to remain in treatment or maintain abstinence or controlled drinking. While this is a small number and proportion of the 'problem drinkers' group, from the point of clinical practice these responses are worthy of attention. At one level practical issues of memory were reported, i.e. failing to remember appointments etc. Other reported aspects were; *"some sad memories I can't deal with yet. When I'm not able to deal with them I drink."* *"Remembering my father's death"*. *"It is the memories, that's why I have to go to counselling to deal with the problems"*. *"If I think about my life, I tend to think more about the negative aspects than the*

positive, more likely to put me to drinking". "Just, they always come out in therapy, makes it harder to stick to it". These participants were able to quite clearly report on their experience of the role of (negative) memories in relapse into drinking and drop out from treatment.

While the sections of this study enquiring into the role of memories in prompting increased or reduced alcohol consumption produce some interesting information, it is important to be cautious in the significance and interpretations that can be drawn. These sections were intended as exploratory enquiries into this area. The nature of questions used to elicit information, structured open ended questions, means the data is very subjective. Questioning also took place at the end of the data collection interview for all participants, after some lengthy enquiries about alcohol consumption and memory. This factor may have in some ways primed participants to report experiences in an expected direction, i.e. 'problem drinkers' developing a tendency to attribute much of their drinking to the influence of memory because they understood this as the underpinnings of this study. Similarly the 'social drinkers' could have been primed to respond with the reverse tendency.

(vii) LIMITATIONS OF THE PRESENT STUDY

The 'problem drinkers' and the 'social drinkers' differ significantly on a number of factors other than their consumption of alcohol. There are a

number of significant demographic differences between the two groups, (e.g. age, estimated pre-morbid intelligence) the potential impact of which need to be considered. Clinical research has long established changes in memory function with age, and there are reported effects of age related cognitive impairment on autobiographical memory (Phillips and Williams 1997). Age related memory decline was not measured in this study. However, no significant correlation between age and generic memory recall for the 'problem drinkers' was found. A more tangible memory difference is the measured poorer current episodic memory performance of the 'problem drinkers' group. However, measured current episodic memory function was not correlated to generic memory response in the 'problem drinkers'. There is an established link between chronic sustained alcohol consumption and memory failure in some people with alcohol problems in the form of Korsakoff's Syndrome (Barba et al 1990), where memory failure is thought to derive from structural brain damage caused by excessive alcohol consumption. There was no measure of structural brain damage in this study. There is no literature to suggest how such damage or Korsakoff's Syndrome might affect autobiographical memory function. This study also did not collect information on other biological problems such as liver damage, which has been associated with confusion and poor memory performance in other clinical groups such as people with acute liver failure. Such organic investigations are invasive and were outside the financial scope of this study.

Closer matching of the participants in the 'social drinkers' group and the 'problem drinkers' group may have helped eliminate some of the background

differences between the two groups. In particular estimated pre-morbid intelligence, as this was correlated with recall of generic memories in 'problem drinkers'. However, estimated pre-morbid intelligence only accounts for 16% of the variance in the tendency towards generic memory recall within 'problem drinkers'.

A further obvious difference between the 'problem drinkers' and the 'social drinkers' is that the 'problem drinkers' were receiving treatment for a psychological problem. Although treatment as an event does not seem to be an influence on the results as no correlation was found between length of time in treatment and specificity of autobiographical memory. A third group from another psychological population could have been included in an attempt to counter this. However, as research has established autobiographical memory biases in emotional disturbance populations this would be of limited value. The higher depression scores of the 'problem drinkers' is a potential confounding factor, although depression as measured by the BDI was not correlated with generic memory recall.

The lack of a standardised measure for alcohol history and chronicity is a limitation. In the absence of such a measure other reported factors had to be relied upon to give an indication of alcohol problem history and chronicity. The potential shortcomings of these factors were discussed earlier. As such as measure is not available this must be a problem faced by other research into alcohol problems. Variables such as age of first drink containing alcohol

and length of problem drinking history were used as advocated in other research (Plinius Maior Society 1994, Edwards, personal communication).

The three words that were randomly selected from the standard AMT to complete the non-alcohol comparison cues were quite negative in connotation (guilty, hopeless from the negative cue valence set and absence from the neutral set). A more balanced approach may have been to randomly select a word from each of the three cue word valence sets. However, as a significant interaction of group with cue word valence was not shown in the standard AMT this may be of limited influence.

There was no analysis of content of memories generated to cue words in terms of whether memories generated referred to situations in which alcohol was involved. This may be of interest. However, as the data collection process itself is centred around alcohol, this may have primed participants to retrieve alcohol related memories. Furthermore, recruitment posters and personal contact explained the research was about alcohol and memory. Participants may have expected they would be asked to provide alcohol related memories and to this end may have prepared some in the time between recruitment and data collection.

Within the scope of the present study and the analysis conducted, clear differences in autobiographical memory performance are seen between the 'problem drinkers' and the 'social drinkers'. There are, however other differences between the groups in addition to their problem drinking status.

Pre-morbid intelligence is significantly lower in the 'problem drinkers' and is correlated with more generic first memories in this group. The 'problem drinkers' are significantly older than the 'social drinkers', however age and generic memory are not correlated for the 'problem drinkers'. The absence of any demonstrated significant correlation between alcohol consumption and problem factors and generic memory recall also requires some caution is exercised in drawing firm conclusions about the origin of the difference in autobiographical memory performance between the two groups.

(vii) RESULTS OF THE PRESENT STUDY IN THE CONTEXT OF
EXISTING AUTOBIOGRAPHICAL MEMORY LITERATURE

The one overwhelming robust finding of existing autobiographical memory literature is the observation of a tendency towards generic memory response among clinical populations; suicide; Williams and Broadbent (1986); Evans et al (1992), depression; Williams (1988); Brittlebank et al (1993); Kuyken and Dalgleish (1995); OCD; trauma and PTSD; McNally et al (1994); Kuyken and Brewin (1995); Wilhelm et al (1997); and cognitive impairment; Phillips and Williams (1997). The results of this study allow 'problem drinkers' to be added to this list. Interestingly the tendency towards recall of generic memories was also demonstrated in 'problem drinkers' for alcohol related cue words. There are some striking similarities, for example, Williams and Scott (1988) found their depressed participants produced specific first memories on only 40% of occasions compared to their non-depressed

controls who were specific for 70% of responses. In this study, 'problem drinkers' were specific for first recalled memory for 50.8% of cues and 'social drinkers' were specific for 76.2%. Evidence for biases towards recall of generic memories in clinical populations is further supported by results for latency to retrieve a specific memory, with clinical samples taking longer to retrieve specific memories than non-clinical control groups. 'Problem drinkers' in this study displayed this tendency for the standard AMT and alcohol related cue words.

The one clinical population studied so far that did not exhibit these autobiographical memory biases are anxious patients. Burke and Mathews (1992) failed to find the predicted biases in high trait anxious patients as did Richards and Whittaker (1990).

The issue of whether people with emotional disturbances exhibit a greater bias in recall of generic memories to positive rather than negative cues has had conflicting findings. Williams (1996) describes studies which have shown both an excess of generic first responses and longer latencies to specific memories for positive cues more than negative cues in depressed patients when compared to non-clinical controls. Brittlebank et al (1993) failed to find this tendency in depression, as did Moore et al (1988). 'Problem drinkers' did not show a greater tendency to recall of generic memories or longer latencies to specific memories for positive more than negative cues when compared to 'social drinkers'.

No significant relationship was shown in this study between severity of alcohol problems as measured and extent of generic memory recall. If this is again compared to other existing autobiographical memory literature, many authors have written that no study has shown a significant relationship between severity of depression and recall of generic memories (e.g. Phillips and Williams 1997). These authors have concluded that autobiographical memory biases are not state dependent but are long-term trait markers rendering people vulnerable to depressive episodes (Brittlebank et al 1993). Observable biases in autobiographical memory function do not disappear when depressive episode remits (Williams 1996). Former depressed patients are as generic as current patients (Williams 1996). This conclusion could be extrapolated to 'problem drinkers'. Perhaps 'problem drinkers' and people with depression have similar autobiographical memory bias traits but develop alcohol problems rather than depression as a presenting symptom.

Williams (1996) hypothesises negative events occurring in childhood may lead to the adoption of a cognitive style of memory function as a coping mechanism that minimises the specific content of events to help manage negative affect. Williams notes the research into people with histories of childhood physical or sexual abuse and autobiographical memory biases in proposing this idea. In this respect it is interesting to note the high proportion of 'problem drinkers' in this study who reported memories of negative life events prompted episodes of drinking.

In studies that have examined autobiographical memory responses to cues associated with the disorder being studied, clinical populations have shown a bias for preferential access (i.e. faster responses) to disorder associated cues. Burke and Mathews (1992) found high trait anxious participants were faster to recall autobiographical memories to anxiety related cues than low anxious controls. Threatening or anxiety-provoking personal events were more readily recalled than other memories, by clinically anxious participants (Burke and Mathews 1992). Similarly, Wright and Morley (1995) found their chronic pain sample recalled pain memories faster than non-pain memories. In this study, 'problem drinkers' did recall memories to alcohol cues marginally faster than to non-alcohol cues (as did the 'social drinkers'), however this difference was not significant. Whether 'problem drinkers' have preferential access to alcohol related memories remains unclear.

Burke and Mathews (1992) found that clinically anxious participants were more generic in response to 'nervous' memories. The authors propose that this is a mechanism for the avoidance of processing of threatening information. The 'problem drinkers' in the present study were marginally more specific in first memory response to alcohol cues compared to non-alcohol cues. A direct comparison between threatening or anxious cues and alcohol cues for the respective groups may not be appropriate. For 'problem drinkers' the connotation of alcohol in a cue may not be threatening or negative in the same way that cues with an anxiety content are threatening for anxious patients. A more realistic comparison may be between anxiety cues and threatening alcohol cues e.g. hangovers, or extreme drunkenness.

Anxious patients (Burke and Mathews 1992) were able to recall a greater number of anxiety related memories than non-anxious controls. In contrast, chronic pain patients did not recall significantly more pain-related memories than non-pain controls (Wright and Morley 1995). Additionally, there was no significant difference between chronic pain patients and controls on the number of pain and non-pain memories recalled.

The responses of 'problem drinkers' in this study show sufficient comparability to the findings with other clinical groups for us to speculate that a similar bias or long-term trait may be in operation. There are also a number of more unique findings with the 'problem drinkers' that raise further questions, for example the lack of demonstrated autobiographical bias in relation to alcohol cues.

(viii) RESULTS OF THE PRESENT STUDY IN THE CONTEXT OF COGNITIVE THEORIES OF ALCOHOL PROBLEMS

An increasing recognition of the complex nature of alcohol use behaviour and alcohol problems has prompted a widening of the research base into understanding these issues. Shakeshaft et al (1993) comment that despite this broadening of research and understanding, alcohol problems remain a significant public health problem and called for further developments in the field. The role of memory in alcohol problems has received surprisingly little

attention, despite the fact that perhaps one of the most common comments of people in alcohol treatment is that they drink to forget.

Looking at the literature on autobiographical memory and other emotional disorders there is a sound basis for examining the role of memory in drinking problems. Memories may have a role in the development and maintenance of alcohol problems at several levels. The general autobiographical memory literature proposes that autobiographical memory biases are a long-term trait predisposing people to emotional disorders. There is no reason to suggest alcohol problems should be excluded from the range of disorders that such a trait might predispose people to. Indeed, the results of this study are consistent with this suggestion. If autobiographical memory biases persist during the course of the alcohol problem recovery is likely to be hindered.

Gossop (1995) advocates a greater understanding of the meaning of substance misuse to the individual and its role in development and maintenance of problems. In alcohol problems the individual's use of alcohol use could be a mechanism for providing relief from the negative affect of particular memories. Drinking may be a response to, or a coping mechanism for intrusive memories. Assessment of memories of alcohol use is an additional way of looking at the meaning of alcohol use at an individual level.

The individual's expectations of the physiological and psychological effects of alcohol use are as important as objectively established effects (Gossop 1995). Such expectations could include anticipated relief from the negative

affect of memories or the blocking of intrusive memories. These individual expectations may have biases attributable to autobiographical memory biases, i.e. lack of specificity leading to unbalanced subjective valence ratings. Alcohol related events may be recalled as more positively than they actually were or non-alcohol events as more negative. A number of participants from the 'problem drinkers' group reported that memories of the negative consequences of drinking at times prompted them to drink less. However, as one participant added "*they (the memories) never last long, only 'til the next time*".

Considering the role of memory might enhance the model of stages of change for substance use behaviours (Prochaska and DiClemente 1982). One of the key areas of this model is the maintenance of change stage. The influence of autobiographical memory biases in problem solving has been demonstrated for other emotional disorders and is equally applicable here. Successfully tackling day-to-day events that threaten maintenance of change requires effective problem solving skills, which in turn relies on adequate access to memories of past similar events. The cycle between maintenance and relapse assumes with every subsequent relapse a person takes with them experiences of managing difficulties from previous occasions. Where autobiographical memory function is impaired this aspect cannot be relied upon.

Relapse prevention, as a self-management strategy for maintenance of positive gains is also likely to be affected by autobiographical memory

function. Relapse prevention is a skills based intervention aimed at aiding an individual to handle potential influences that might promote relapse (Gossop 1995). Mood state situations have been identified as the most frequent precipitant of relapse in 'problem drinkers', accounting for up to 38% of all relapse episodes (Brown et al 1997). As participants from the 'problem drinker' group in this study reported, memories (especially negative memories) can prompt increases in drinking behaviour. In this respect memories could be regarded as comparable to other high-risk cues such as going into a pub, or engaging in activities that previously frequently co-occurred with drinking. Negative memories of the consequences of drinking could be used to help people counter other cues to drinking. In drawing up a 'pros and cons' list for drinking (a common technique in cognitive therapy) effective memory function is required. Memories might usefully be included in cue exposure approaches to relapse prevention. In this study, 'problem drinkers' reported a stronger desire to continue drinking after recalling a memory when intoxicated than 'social drinkers'. 'Problem drinkers' also reported a stronger desire to drink after recalling a memory when intoxicated than they did when sober compared to 'social drinkers'. 'Problem drinkers' also reported a greater likelihood to follow this desire through to actual further drinking when intoxication than 'social drinkers'. It seems recall of a memory when intoxicated is a particularly hazardous situation, in terms of further alcohol consumption, for the 'problem drinkers'

Tiffany (1990) proposes drinking behaviours, as with other practised and repeated actions, are in essence automatic processes requiring little

cognitive effort to initiate or maintain. Urge responding, on the other hand is a non-automatic process requiring cognitive effort to resist. In view of this it was proposed that levels of current craving, requiring cognitive input, would be correlated with generic memory recall, as specific memory recall also requires cognitive effort. This hypothesis was not supported by the current research, as there was no significant correlation between current craving and generic memory recall for the 'problem drinkers' or the 'social drinkers'. As a measure of current craving was used, it may be that the interview situation does not provoke sufficient levels of craving that require a substantial amount of cognitive resource to interfere with specific memory recall. A paradigm for further testing this hypothesis could examine craving and autobiographical memory response in the presence of stronger potential cues to craving, i.e. a laboratory setting with alcohol present, or in the context of a drinking environment.

Tiffany (1990) suggests memories of the positive effects of alcohol use might stimulate cravings. However, in the present research there was no significant difference between the 'problem' and 'social drinkers' on subjective valence ratings of memories recalled to alcohol cues compared to non-alcohol cues. Both groups subjectively rated memories recalled in response to alcohol cues more positively than those recalled in response to non-alcohol cues. In terms of craving, again memories of past experiences may be important in helping someone effectively manage their response to these cravings.

This study did suggest some preferential access to specific memories in response to alcohol cues for 'problem drinkers'. Contrary to prediction, 'problem drinkers' were more specific in response to alcohol cues than non-alcohol cues. How such preferential access might affect craving and consumption is of potential importance.

(ix) CLINICAL IMPLICATIONS OF THIS STUDY

At a clinical level the findings of this study have a bearing on general clinical practice with this client group. Clinicians should be aware that in assessment, intervention and evaluation of outcome, self reported information might be tainted by biases in autobiographical memory recall. In interpersonal therapies memories are employed as tools in the same way as language, behaviour and cognitions, their reliability needs to be carefully monitored. In the course of therapy clinicians should not necessarily consider the difficulties of clients to produce memories of specific instances as deliberate avoidance or an attempt to frustrate the therapeutic process (Williams 1996). Instead such difficulties should be regarded as part of the clinical syndrome.

Clinicians must also bear in mind that memories might make the process of therapy threatening for the client. The reports of some participants from the 'problem drinkers' group quite clearly refer to this. Clinicians might pre-empt potential drop out by sharing this concern with clients. As with any defence,

it is the responsibility of the therapist to ensure adequate alternative coping mechanisms are in place before any deconstruction of current coping strategies is undertaken. As such before engaging in shifting any reluctance to contemplate negative memories which seem to promote drinking, therapists need to be sure clients have ways other than drinking to manage the likely negative affect.

Part of the intervention should be directed towards promoting insight on the part of the client into the biases of their memory. Clients could be encouraged to take an overtly critical approach to their memories just as cognitive therapies for depression promote critical evaluation of negative automatic thoughts and over-negative thinking.

Within existing treatment approaches, therapists should incorporate aspects aimed directly at memory in their application. Suggestions have been made for ways in which the stages of change model should take on board the likely consequences of autobiographical memory biases. The instruction into relapse prevention skills should make direct reference to the potential role of memory in provoking relapse, and might well use negative drinking memories as tools for managing potential relapses. Interventions derived from cue exposure theory should include alcohol-related memories and negative life event memories as potential cues.

In the light of this study interventions aimed directly at addressing autobiographical memory problems need to be developed. Such

interventions might sensibly be based on strategies used with other emotional disorders to address autobiographical memory deficits. Other established interventions might usefully be adapted. Interventions from cognitive therapy which are focused on breaking cycles of automatic negative thoughts and over-negative thinking could potentially be effective ways of promoting self critiques of memory performance. Techniques of thought challenging might be modified to become memory challenging. As with cognitive approaches to depressive thinking, skills directed at promoting improved autobiographical memory function might be an effective investment in terms of self-management in the future and preventing relapse.

Approaches seeking to desensitise 'problem drinkers' to established drink-provoking memories might follow interventions that desensitise people who have intrusive trauma or PTSD related cognitions. In terms of helping 'problem drinkers' deal with practical memory deficits and failures, written memory aids might be encouraged, drawing on interventions used with people in the early stages of dementing processes.

With increasing attention towards evaluating clinical outcome, positive changes (e.g. increased specificity and reduced latency) in autobiographical memory performance over the course of an intervention could potentially become a useful outcome indicator.

(x) IMPLICATIONS FOR RESEARCH INTO ALCOHOL PROBLEMS

One obvious area as a potential research priority is the development and evaluation of any specific interventions for the treatment of autobiographical memory biases in 'problem drinkers'. Alongside this, it might be beneficial to develop an appropriate clinical assessment tool or protocol with population norms. The research procedure is likely to be too time consuming to be used in a routine assessment and has no comparison data. The standard AMT could be adapted to serve this function. The issue of outcome and autobiographical memory factors in the treatment of 'problem drinkers' could potentially yield valuable clinical information. In depression poor autobiographical memory function at assessment predicted poor outcome from treatment.

Since the present study is cross-sectional, no conclusions can be drawn about the robustness of autobiographical memory biases in 'problem drinkers' over time. Are these biases, as research in other areas of emotional disturbance might suggest, non-state dependent, long-term traits?

In this study the relationship between autobiographical memory function and problem solving skills has been assumed, on the basis of research with other clinical populations. The literature could be strengthened by specific investigation of this relationship in a 'problem drinking' population. Of note is the finding in this study that 'problem drinkers' were slightly more specific in response to alcohol cues compared to non-alcohol cues. In terms of problem

solving, might this mean the higher specificity of alcohol related memories leads to more alcohol related solutions being attempted to solve problems?

The sections in this study looking at memories which prompt increased or decreased alcohol consumption were designed as exploratory investigations. More systematic enquiry into this area might produce useful findings. Further examination of alcohol consumption factors that account for autobiographical memory biases is also indicated. The failure of this study to find any significant associations between the alcohol problem factors considered and autobiographical memory biases could be an artefact of the measures of alcohol problems used, as discussed earlier in this chapter.

In addition, there might be valuable post-hoc analyses that could be performed on the existing data for this study. No specific attention was paid to individual differences within the 'problem drinkers' group. Not all the 'problem drinkers' showed a stronger tendency towards recall of autobiographical memory response to the same extent, some had responses more like those of the 'social drinkers' than of other 'problem drinkers'. Any association between subjective valence rating of specific memory recalled and lack of specificity memory recall was not analysed. Post hoc analysis of this data would be worthwhile.

CONCLUSION

This study clearly shows biases in autobiographical memory function in 'problem drinkers' compared with 'social drinkers', several of these biases are in line with predictions drawn from the existing literature on autobiographical memory function in other areas of emotional disorder. This study has also demonstrated some novel features of autobiographical memory biases in 'problem drinkers', especially in the realm of responses to alcohol cue words. The reports of participants indicate a role of memory in drinking behaviour, especially relapse. Of particular note is the enhanced desire for 'problem drinkers' to start / continue drinking following memory recall and their increased likelihood to follow this through to actual consumption compared to 'social drinkers'.

The findings of this study have implications for general clinical practice with this client group as well as demonstrating a need to develop memory related interventions for alcohol problems. Examining alcohol consumption variables that account for autobiographical memory function impairment, in particular further enquiry into the role of craving might usefully extend the research in this area.

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Would you like to take part in a new research study?

THE EFFECTS OF ALCOHOL USE ON MEMORY

This research looks at the effects of alcohol use on people's memory. We are asking people who are currently receiving treatment for alcohol problems if they would take part.

What does the research involve?

If you agree to take part, you will be asked to fill in a few short questionnaires. You will be asked to describe a memory that comes to mind connected to some words that will be read to you. The interview should take less than an hour and you will be given a £5 voucher to thank you for your time.

How will the research help?

By taking part in this study you will help our understanding of alcohol related problems. This is the first time this area of memory and alcohol use has been studied. We hope the research will enable us to understand further the effects of alcohol use and produce more effective treatments. Your contribution to this study will be valuable and could lead to greater understanding and improved treatments. The research will also be written up as part of a post graduate degree.

Will the interview be confidential?

All responses will be confidential to the researcher, and will not be shown to anyone working in the treatment services. Your name will not be stored with your responses. Your questionnaires will be numbered, your name will not be written on them. The consent form you sign will not be stored with the questionnaires.

You do not have to take part in this study if you do not want to. If you decide to take part, you may withdraw at any time without having to give a reason. *Your decision whether or not to take part in the research will not affect the treatment and care you receive from AASCI in any way.*

To take part in the research you need to: -

- have been receiving treatment for alcohol problems for at least one month, but not longer than twelve months.
- NOT drink any alcohol for 24 hours before the interview.

If you would like to take part or would like to find out more, please let your keyworker or any member of staff know. You can contact me directly by leaving a message for me, **Christopher Whiteley** at (x contact telephone details x).

CONSENT FORM

The Effects of Alcohol Use on Memory

RESEARCHER;
Christopher Whiteley, (x address of treatment service x)

To be completed by the volunteer;

1. I have read the 'Participant Information' sheet about this study? **YES / NO**
2. I have had the opportunity to ask questions and discuss this study? **YES / NO**
3. I have received satisfactory answers to all my questions? **YES / NO**
4. I have received sufficient information about this study? **YES / NO**
5. Which health professional have you spoken to about this study?
.....
6. I understand I am free to withdraw from this study...
*at any time
*without giving a reason for withdrawing
*without affecting my future medical care **YES / NO**
7. Do you agree to take part in this study? **YES / NO**

Signed: (Participant) Date:

Name in block letters:

Signed: (Researcher)
C M Whiteley.



CAMDEN & ISLINGTON
Community Health Services NHS Trust

Your Partner for Health

LOCAL RESEARCH ETHICS COMMITTEE

Medical Directorate, Vezey Strong Building, 112 Hampstead Road, London NW1 2LT

Tel: 0171 530 3055 Fax: 0171 530 3018

e-mail: sue.rodmeil@dial.pipex.com

30 July, 1997

Dr Valerie Curran
Reader of Psychopharmacology
Sub-Department of Clinical Health Psychology
University College London
Gower Street
LONDON
WC1E 8BT

Dear Dr Curran

Application No: 97/81

Title: The affects of alcohol use on personal memory

The Local Research Ethics Committee considered the above application at its meeting on 28 July 1997 and I am pleased to say it has no objections on ethical grounds to the proposed study. Therefore, it is happy to give you approval for this project. However, the Committee would like the Patient Information Sheets to state that the study is being carried out for the purposes of a doctorate.

Please note that the following conditions of approval apply:

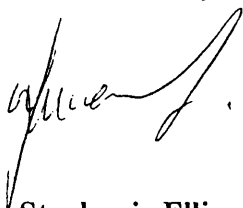
- ◆ It is the responsibility of the investigators to ensure that all associated staff including nursing staff are informed of research projects and are told that they have the approval of the Ethics Committee.
- ◆ If data are to be stored on a computer in such a way as to make it possible to identify individuals then the project must be registered under the Data Protection Act 1984. Please consult your department data protection officer for advice.
- ◆ The Committee must receive immediate notification of any adverse or unforeseen circumstances arising out of the trial.
- ◆ The Committee must receive notification: a) when the study is complete; b) if it fails to start or is abandoned; c) if the investigator/s change and d) if any amendments to the study are made.

Dr Curran
30 July 1997
Page 2

- ♦ The Committee will request details of the progress of the research project periodically (i.e. annually), and require a copy of the report on completion of the project.

With best wishes.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Stephanie Ellis', written in a cursive style.

Stephanie Ellis
CHAIR

THE AUDIT QUESTIONNAIRE

Please circle the correct answer for you..

1. How often do you have a drink containing alcohol?

NEVER	MONTHLY OR LESS	2 - 4 TIMES A MONTH	2 - 3 TIMES A WEEK	4 OR MORE TIMES A WEEK
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2. How many drinks containing alcohol do you have on a typical day when you are drinking?

1 or 2	3 or 4	5 or 6	7 to 9	10 more
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3. How often do you have six or more drinks on one occasion?

NEVER	LESS THAN MONTHLY	MONTHLY	WEEKLY	DAILY OR ALMOST DAILY
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4. How often during the last year have you found you were not able to stop drinking once you had started?

NEVER	LESS THAN MONTHLY	MONTHLY	WEEKLY	DAILY OR ALMOST DAILY
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5. How often during the last year have you failed to do what was normally expected of you, because of your drinking?

NEVER	LESS THAN MONTHLY	MONTHLY	WEEKLY	DAILY OR ALMOST DAILY
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SEVERITY OF ALCOHOL DEPENDENCE QUESTIONNAIRE

DATE _____

Please recall a typical period of heavy drinking in the 6 months before you started treatment.

When was this? Month: _____ Year: _____

Please put a tick (✓) to show how often each of the following statements applied to you during this time.

DURING THAT PERIOD OF HEAVY DRINKING:

	NEVER OR ALMOST NEVER	SOMETIMES	OFTEN	NEARLY ALWAYS
1. I woke up feeling sweaty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. My hands shook first thing in the morning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. My whole body shook violently first thing in the morning if I didn't have a drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I woke up absolutely drenched in sweat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I dreaded waking up in the morning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I was frightened of meeting people first thing in the morning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I felt at the edge of despair when I awoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I felt very frightened when I awoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I liked to have a morning drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I always gulped my first few morning drinks down as quickly as possible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I drank in the morning to get rid of the shakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I had a very strong craving for drink when I awoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I drank more than ¼ bottle spirits a day (or 4 pints beer/2 cans strong lager /1 bottle table wine)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I drank more than ½ bottle spirits a day (or 8 pints beer/4 cans strong lager /2 bottles wine)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I drank more than 1 bottle spirits a day (or 15 pints beer/8 cans strong lager /4 bottles wine)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I drank more than 2 bottles spirits a day (or 30 pints beer/15 cans strong lager /8 bottles wine)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PLEASE MAKE SURE YOU HAVE ANSWERED ALL THE QUESTIONS WHICH APPLY TO YOU
PLEASE TURN PAGE

(CONTINUED)

Imagine the following situation:

(1) You have been COMPLETELY off drink for a FEW WEEKS

(2) You then drink VERY HEAVILY for TWO DAYS

How would you feel the morning after those two days of heavy drinking?

THE MORNING AFTER:

17. I would start to sweat

18. My hands would shake

19. My body would shake

20. I would be craving for a drink

	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A LOT
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SCORE

--	--

A.C.Q - Now

Number: Date:

INSTRUCTIONS: Indicate how much you agree or disagree with each of the following statements by placing a tick () along the line between STRONGLY DISAGREE and STRONGLY AGREE. The closer you place your tick to one end or the other indicates the strength of your disagreement or agreement with the statement. Please complete every item. We are interested in how you are thinking or right now as you are filling out the questionnaire.

RIGHT NOW

1. If there was alcohol right here in front of me, it would be hard not to use it.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

2. Drinking alcohol would not be pleasant right now.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

3. I would feel better if I could drink.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

4. If I had the chance to use alcohol, I think I would drink.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

5. Drinking would be wonderful.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

6. Even if it were possible, I probably wouldn't drink right now.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

7. Right now, I miss drinking.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

8. I am going to drink as soon as I possibly can.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

9. I would feel less jittery if I used alcohol right now.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

10. Drinking would make things seem just perfect.

STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

RIGHT NOW

11. I have an urge to drink now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
12. Right now, I am not making any plans to drink.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
13. I would feel more in control of things right now if I could drink.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
14. Drinking would make me feel less jittery.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
15. I could not stop myself from drinking if I had some alcohol here.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
16. If I drank a little alcohol right now, I would not be able to stop using it.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
17. I want to drink so bad I can almost taste it.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
18. Nothing would be better than drinking right now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
19. I would do almost anything for a drink.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
20. Having a drink would be ideal.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
21. I want to use alcohol right now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
22. I would feel less irritable if I used alcohol now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
23. I am thinking of ways to get alcohol.

RIGHT NOW

24. All I want to do right now is drink.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
25. It would be difficult to turn down a drink right this minute.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
26. Starting now, I could go without drink for along time.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
27. Drinking would not be very satisfying right now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
28. If I used alcohol right now, I would feel less tense.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
29. I would not enjoy drinking right now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
30. If I had the chance to use alcohol, I think I would drink.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
31. I would not be able to control how much alcohol I drank if I had some here.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
32. It would be great to use alcohol now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
33. If I had some alcohol right now, I would probably drink it.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
34. I would feel less restless if I drank alcohol right now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
35. I could easily limit how much alcohol I drank right now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE
36. I do not need to use alcohol now.
STRONGLY DISAGREE ___: ___: ___: ___: ___: ___: ___ STRONGLY AGREE

RIGHT NOW

37. I will drink as soon as I get the chance.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

38. I have no desire to drink right now.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

39. If I were using alcohol now, I would feel less nervous.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

40. I have no urge to drink now.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

41. Drinking would not make me content.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

42. I think I could resist using alcohol right now.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

43. It would be easy to pass up the chance to use alcohol.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

44. I crave alcohol right now.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

45. If I were offered some alcohol, I would drink it right away.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

46. Drinking would put me in a better mood.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE

47. My desire to drink seems overpowering.

STRONGLY DISAGREE __: __: __: __: __: __: __ STRONGLY AGREE