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**The Correlates and Consequences of Alcohol Consumption  
in Elderly Social Drinkers**

**Lina S. Bortolussi**

**A Thesis  
in  
The Department  
of  
Psychology**

**Presented in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy at  
Concordia University  
Montreal, Quebec, Canada**

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## Abstract

### The Correlates and Consequences of Alcohol Consumption in Elderly Social Drinkers

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This study focussed on the correlates and consequences of alcohol consumption in elderly social drinkers. The research examined the effects of moderate levels of alcohol consumption on cognitive and psychological functioning. Specifically, this study examined the applicability of the continuity and specificity hypotheses of alcohol-related cognitive effects to moderate drinking and also tested the effects of alcohol consumption on subjective well-being. The continuity hypothesis espouses a dose-response relationship between high levels of alcohol consumption and cognitive functioning. The specificity hypothesis states that alcohol-related cognitive declines are specific to frontal functions. Theoretically relevant sociodemographic, intellectual and psychosocial variables were also included in the study as control variables and to replicate previous findings. The sample consisted of 124 male and female elderly social drinkers between the ages of 61 and 90. They completed questionnaires on health, extraversion, neuroticism, locus of control, social support, activities, well-being, intelligence and alcohol consumption. Tests of frontal and temporal neuropsychological functions were also completed during two separate sessions. The results from regression analyses indicated the importance of education and gender in predicting lifetime alcohol consumption for elderly social drinkers. No support was found for the continuity and specificity hypotheses of alcohol

consumption. As expected, age-related declines were observed for cognitive functioning. Intelligence and good physical health emerged as positive predictors of frontal functioning. Education played a more important role in temporal cognitive functioning. There were no effects of alcohol on subjective well-being for this sample. In line with previous research, well-being was associated with good self-reported physical health, internal locus of control, low neuroticism, and involvement in socially oriented activities. The results also suggested that some demographic variables (age, education, health) and intelligence are of greater importance than personality and other psychosocial variables, in accounting for alcohol consumption levels and cognitive functioning in elderly social drinkers. Limitations of this study including a small sample size and the low levels of alcohol consumption may have influenced the present findings.

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## Theoretical Overview

This research examined the correlates and consequences of alcohol consumption in healthy, elderly social drinkers. The research had three main objectives. One objective was the examination of sociodemographic and psychosocial correlates of alcohol consumption in elderly social drinkers. The other objectives were to assess the relationship between alcohol consumption and indices of cognitive and psychological functioning in elderly social drinkers while controlling for the effects of several relevant sociodemographic, intellectual and psychosocial variables.

Within the context of the first objective, this research examined the issue of age-related declines in alcohol consumption. The question of whether socioeconomic status influences retrospective reports of alcohol consumption over the individual's lifespan was also addressed. Within the context of the alcohol consumption-cognitive functioning link, this research examined whether Ryback's (1971) continuity theory of alcohol-related cognitive effects can be extended to the social drinking range. This theory proposes a dose-response relationship between levels of alcohol consumed and extent of cognitive impairment at higher levels of alcohol consumption. This research also provided a test of the specificity hypothesis as it pertains to alcohol-related neuropsychological deficits. If such deficits do exist, it addressed the question of whether alcohol consumption effects are specific to frontal cortical functions or whether the deficits are generalized to other cerebral functions as well. The availability of a longitudinal data pool for a number of the neuropsychological variables also provided an opportunity to examine concurrent as well as predictive relationships between alcohol consumption and neuropsychological functioning.

Based on the available literature, the variables chosen for study are considered to be central to alcohol consumption, cognitive functioning and well-being. These variables continue to be representative of domains of interest in the field of aging. The influence of alcohol consumption was examined on the dependent variable of cognitive functioning (as reflected by measures of frontal and temporal cerebral functioning) after controlling for the effects of sociodemographic, intelligence and psychosocial variables. The sociodemographic variables included in the analyses consisted of age, gender, years of education (as an index of socioeconomic status), marital status and self-reported health. The intelligence control variable consisted of scores on the War M-test vocabulary subtest. The psychosocial variables included extraversion, neuroticism, locus of control, satisfaction with one's social support and activity level. These same sociodemographic and psychosocial variables were used as controls for the examination of alcohol effects on subjective well-being and as predictors of lifetime alcohol consumption.

### Correlates of Alcohol Consumption in Adulthood

Until the last decade, most research on the correlates and consequences of alcohol use has focussed mainly on alcoholics with a relative neglect of the rest of the continuum of drinking patterns. The field was characterized by a general lack of interest in the nonalcoholic elderly with regards to their patterns of alcohol consumption. Consequently, this literature has a relative paucity of information concerning drinking patterns in non-alcoholic healthy older individuals (Goodwin, Sanchez, Thomas, Hunt, Garry & Goodwin, 1987). The longer life expectancy of individuals in our country and the changing distribution of the Canadian population with the elderly being the fastest growing age group has

increased the interest of researchers in studying the correlates and consequences of aging (Eliany & Clarke, 1992). with regards to alcohol consumption in the elderly, there has been increased attention to the continuum of drinking patterns, a recent shift away from the view of alcoholism as a predominantly male disease and an increased recognition for the need to examine the drinking patterns in women as well.

This research attempted to add to the literature on alcohol consumption in the elderly by focussing on the correlates and consequences of lifetime alcohol consumption in a sample of nonalcoholic elderly men and women. The demographic factors of gender, age, marital status, education and self-reported health were used as control variables as were the psychosocial variables of extraversion, neuroticism, locus of control, social support and involvement in activities.

#### Sociodemographics and alcohol consumption

The National Alcohol and Other Drugs Survey (NADS) is a major Canadian study completed in 1989 for Health and Welfare Canada that focussed on the patterns of alcohol use of Canadians over the age of 15 (Eliany & Clarke, 1992; Eliany, Giesbrecht, Nelson, Wellman & Wortley, 1992). According to this survey, more than three quarters (77.7%) of Canadians over the age of 15 are considered current drinkers, having consumed at least one alcoholic drink in the year preceding the survey. Approximately 7% of those surveyed considered themselves as lifetime abstainers, defined as never having consumed an alcoholic beverage. The remaining 16% considered themselves as former drinkers, no longer consuming alcohol but having consumed alcohol at some point earlier in their lives. For the older individuals surveyed (65+), there is a lower percentage of current drinkers (54%) but approximately twice as many

abstainers (15%) and former drinkers (31%) in contrast to the rest of the sample. The data from the NADS (Eliany & Clarke, 1992) and the 1990 Health Promotion Survey (Hewitt, Vinje & Macneil, 1995) further indicated that the proportion of current drinkers decreases with age whereas the proportion of abstainers and former drinkers tends to increase with age.

The findings from the NADS also indicated that men consumed more alcohol, more frequently than women across all age groups surveyed (Eliany & Clarke, 1992). This gender-related finding in levels of alcohol consumption was consistent with other epidemiological literature on alcohol consumption (Fillmore, 1984; Graham, Carver & Brett, 1996; Midanik & Clark, 1994; Saunders, 1980). In a meta-analysis of life course variation in drinking based on 39 longitudinal surveys, this gender difference was found to hold across various age groups and indices of alcohol consumption (Fillmore, Hartka, Johnstone, Leino, Motoyoshi & Temple, 1991). Demographic data from various studies indicate that in contrast to women, there is a higher incidence and percentage of men who consume alcohol on a regular basis (Fillmore, 1987b; Graham, et al., 1996; Health & Welfare Canada, 1992; Hilton, 1988; Williams & DeBakey, 1992; York & Welte, 1994). This pattern also extends to healthy elderly populations (Douglass, Schuster & McClelland, 1988; Goodwin et al., 1987; Rozzini & Trabacchi, 1993). The evidence of more frequent as well as heavier drinking among older men in contrast to women further characterizes the pattern of findings in this area (Arbuckle, Chaikelson & Gold, 1993; Arbuckle, Chaikelson, Lapidus & Gold, 1994; Barnes, Welte & Dintcheff, 1991; Dawson, 1993; Falkowski, Hatcher, Sondhi, Fong & Young, 1986; Hilton & Clark, 1987; Murdoch & Pihl, 1984; Olenick & Chalmers, 1991; Rozzini & Trabucchi, 1993; Single & Wortley, 1993). Such gender-related differences argue against the convergence in levels of alcohol consumption from young adulthood to the elderly.



Within the area of epidemiological research on alcohol consumption patterns, the last two decades have witnessed an increasing interest and focus on women's drinking. This growing interest seemed to parallel the women's movement that was marked by the resulting breakdown of traditional social roles and the entry of an increasing number of women into the labor force (Parker & Harford, 1992a; Shore, 1992; Wilsnack & Wilsnack, 1992). The hypothesis was advanced that the breakdown of traditional social and moral barriers that were imposed on women in the previous decades would lead to an expected increase in the consumption of alcohol by women. Studies that have compared alcohol consumption patterns between women in paid employment and women who are not employed outside of the home have reported a higher frequency of drinking and greater consumption volume for employed women (Chaikelson, 1996; Hamlett, Eaker & Stokes, 1989; Health & Welfare Canada, 1992; Parker & Harford, 1992; Parker, Parker, Wolz & Harford, 1980). Additionally, it was hypothesized that this increase in alcohol consumption by women would lead to a convergence in drinking levels between the genders. That is, women who were functioning in social roles similar to those of men would develop drinking patterns similar to men in these social roles.

Some support for the convergence hypothesis (Mercer & Khavari, 1990) has been reported in studies that have examined both cross-sectional and longitudinal patterns of alcohol consumption. A cross-sectional study conducted with first year medical students reported no sex differences in consumption levels of wine and distilled spirits (Richman & Flaherty, 1986). Male students reported drinking more beer, more frequently than female students. However, there was a trend for females to drink more wine, more frequently than their male counterparts. These data suggest relatively similar drinking patterns for male and female students. A longitudinal study that examined drinking behavior in

college students over an 8-year period reported a convergence of volume of wine and liquor consumed per drinking occasion for males and females from 1977 to 1985. An additional finding was a decrease in the sex ratio for beer drinking occasions and drinking beer more than once a week by 1985 (Mercer & Khavari, 1990). A third study failed to find differences in levels of consumption on drinking days between male and female student social drinkers when consumption was expressed in terms of amount of alcohol per kilogram of lean body mass (York & Welte, 1994).

Other studies have examined the alcohol consumption patterns of men and women in paid employment. Such studies were based on the assumption that being in the work force would be associated with an increase in levels of alcohol consumption in women that would eventually converge with those of men. With the exception of one study (Harvey, Butler, Thomas & Jenkins, 1992), most of these studies have pointed to gender differences in drinking patterns. The pattern of findings typically points to greater alcohol consumption in males as compared to females (Hammer & Vaglum, 1989; McAuliffe, Rohman, Breer, Wyshak, Santangelo & Magnuson, 1991; Parker & Harford, 1992a; Parker & Harford, 1992b). Despite being in similar positions and being exposed to the same work-related conditions as males, being in paid employment did not seem to influence women's drinking patterns to the point of convergence with those of men. The results from these studies as well as from epidemiological studies on patterns of alcohol consumption in various age groups suggest that the gender gap still remains.

The present study attempted to examine further the issue of gender-related differences in alcohol consumption in a sample of elderly social drinkers. In addition to regression analyses, the use of lifespan curves (Arbuckle, Chaikelson & Maag, 1995) provided additional descriptive data that permitted

further examination of the levels of lifetime alcohol consumption for males and females.

In addition to the effects of gender, age-related patterns have also been reported in alcohol consumption across the adult lifespan. A general finding has been that of a decrease in the incidence and frequency of drinking and an increase in the level of abstinence as people get older, particularly after the age of 50 (Arbuckle et al., 1993; Goodwin et al., 1987; Harford & Mills, 1978; Health & Welfare Canada, 1992; Hilton & Clark, 1987; Vogel-Sprott & Barrett, 1984; Wilsnack, Wilsnack & Klassen, 1984). The elderly are less likely than younger and middle-aged persons to be drinkers (Akers & LaGreca, 1991; Graham et al., 1996). In two studies using separate longitudinal and cohort analyses, Fillmore (1987a; 1987b) reported an increase in abstinence after the age of 50 and a decrease in the incidence of heavy drinking and the prevalence of heavy frequent drinking with increasing age. The pattern of findings was similar for longitudinal and cohort analyses, therefore strengthening the validity of the results. In this study, age-related effects on alcohol consumption levels are hypothesized such that levels of alcohol consumption will decline with increasing age.

Consistent findings have also been reported for other demographic factors including education and income as indices of socioeconomic status as well as marital status. The results from some studies have indicated a positive association between higher levels of socioeconomic status and higher nonalcoholic levels of alcohol consumption (Arbuckle et al., 1995; Chaikelson, 1996; Douglass et al., 1988; Health & Welfare Canada, 1992; Single & Wortley, 1993). Studies that examined potential gender differences in this pattern showed similar patterns for both males and females (Barnes et al., 1991; Goodwin et al., 1987). Studies that have focussed on alcohol consumption patterns in women in various high-level positions as an index of high socioeconomic status (ie.

business, professional) have reported high percentages of women as light to moderate drinkers with figures ranging between 72.2% and 94.6% (LaRosa, 1990; Shore, 1985; Shore & Batt, 1991).

Studies have also reported a correlation between time spent in drinking settings and increased alcohol consumption (Shore & Batt, 1991; Shore & Pieri, 1992). A higher socioeconomic status tends to be associated typically with occupations at the higher end of the occupational prestige spectrum (ie.: managerial level positions, professional). Such types of occupations may involve more frequent work-related social occasions (such as dinners with clients, conventions, conferences) where the opportunity for alcohol consumption is often present. This may be translated into more frequent social drinking occasions. Despite this increased consumption, individuals in these occupational levels generally remain light to moderate drinkers. This suggests that the relation between drinking and being in paid employment is not consistent and systematic (Rodin & Ickovics, 1990). In contrast, low socioeconomic status has been found to be associated with a higher incidence of alcohol dependence problems among those who consume alcohol (Barnes et al., 1991; Douglass et al., 1988; Goodwin et al., 1987; Harford, Parker, Grant & Dawson, 1992; Single & Wortley, 1993; Wilsnack et al., 1984; Windle & Blane, 1989).

Based on these findings, it was expected that years of education used as an index of socioeconomic status would emerge as a positive predictor of alcohol consumption levels in our sample of social drinkers. The use of lifespan curves provided the opportunity for generating descriptive data on the influence of socioeconomic status on lifetime alcohol consumption patterns of individuals differing in socioeconomic status.

The empirical literature has also provided evidence on the effects of marital status on alcohol consumption. The NADS (Health & Welfare Canada,

1992) has reported a higher percentage of current drinkers among never married, single Canadians (82%) as opposed to widowed Canadians who had the lowest percentage of current drinkers (49%). Individuals who were married, divorced or separated had percentages that fell in between that range. Other studies have reported higher levels of alcohol consumption for men who were divorced/separated or cohabiting in contrast to married men (Barnes et al., 1991; Arbuckle et al., 1994; Wilsnack et al., 1984). In addition to replicating the findings for men, a similar pattern of findings was reported for women (Arbuckle et al., 1995; Shore, 1985; Wilsnack et al., 1984). Consistent with this pattern of findings, studies have also reported lower levels of current alcohol consumption in women who were either married or widowed (Celentano & McQueen, 1984; Wilsnack et al., 1984).

### Psychosocial factors and alcohol consumption

A preponderance of studies has provided a large foundation of evidence for the relationship between demographic factors and various parameters of alcohol consumption. In contrast to demographic factors, there is a relative paucity of research focussing on the link between various psychosocial variables and non-alcoholic levels of alcohol consumption. This section will provide a general review of the available literature on the relation between social drinking and the variables of extraversion, neuroticism, locus of control, social support and involvement in activities. Most of these variables were selected for inclusion in this study based on the literature suggesting relationships between these variables and problem drinking.

### Personality

Most of the research examining personality variables and alcohol consumption has focussed on the differences in extraversion and neuroticism

between alcoholics and nonalcoholics. Typically, the extraverted individual is described as sociable, impulsive, talkative and active in contrast to the introvert who is usually described as reserved, quiet and introspective. The individual high in neuroticism is typically described as emotionally labile with a tendency to overreact and worry (Costa & McCrae, 1986; Eysenck & Eysenck, 1968). This research has been primarily retrospective in nature and has provided inconsistent findings. Early studies have indicated no differences on the EPI extraversion-introversion dimension between alcoholics and nonalcoholics but have reported higher neuroticism scores for alcoholics in contrast to nonalcoholic controls (Keehn, 1970; Rosenberg, 1969; Shaw, MacSweeney, Johnson & Merry, 1975).

Early research indicated similar response patterns for different groups of alcoholics that are characterized by higher scores on EPI neuroticism and no differences for extraversion scores (Barnes, 1983). Some more recent studies have also reported no relationship between extraversion scores as measured on the EPI and various indices of alcohol consumption in groups of elderly male alcoholics versus nonalcoholics (Gold, Andres, Chaikelson, Schwartzman & Arbuckle, 1991) and in groups of elderly male social drinkers (Chaikelson, Arbuckle, Van der Weyden, Gold, Andres & Schwartzman, 1987-88). The results from these same studies also indicate higher neuroticism scores in alcoholics than in nonalcoholics, and no significant relationship between EPI-Neuroticism and self-reported total lifetime drinking. The differences in neuroticism reported between alcoholics and nonalcoholics may be due to higher anxiety levels that may be associated with more frequent and heavier drinking in the alcoholics. In contrast to the findings for the alcoholics, neither neuroticism nor extraversion was found to distinguish between various subgroups of social drinkers. The lack of significant findings for these personality variables imply their minor role in the differentiation of social drinkers.

The results from other studies conducted with samples of young adults indicated a contradictory pattern of findings. In one study, higher average alcohol consumption was found to be associated with higher extraversion scores but no significant effects were obtained for neuroticism in young adult males (Allsopp, 1986). A study examining personality and situational determinants of drinking behavior in young adults led to opposite results (Forsyth & Hundleby, 1987). In contrast to the previous study, higher scores on a neuroticism/anxiety questionnaire were associated with more drinking in socially stressful situations. No significant findings were observed for extraversion. A third study compared three groups of drinkers (light social drinkers, heavy social drinkers, alcoholics) on extraversion and neuroticism (Robson, 1989). The results from this study indicated significantly higher extraversion scores for the heavy social drinkers in contrast to the other two groups. The consistent finding of higher neuroticism scores for the alcoholics in contrast to the social drinkers was also reported. This further supports the notion that higher trait anxiety levels may contribute to the desire to consume more alcohol.

Additional studies conducted to identify gender-related differences that may exist in the relationship between personality and alcohol consumption showed a lack of consistent findings, rendering conclusions difficult. The results from one study suggested that different personality correlates vary with the type and amount of alcohol consumed in a college population of men and women. In this study, Lester and Rassas (1986) found that men with low scores in extraversion but high scores in neuroticism tend to drink more wine in contrast to other types of alcohol and also tend to drink more than women. Neuroticism was not a significant factor in women's alcohol drinking patterns but high scores on extraversion were associated with a higher frequency of consuming alcohol. A more recent study also reported differential effects for extraversion and

neuroticism in the alcohol consumption patterns of elderly female and male social drinkers (Arbuckle et al., 1993). Higher neuroticism scores were associated with higher mean levels of lifetime drinking in females but not in males. No significant findings were reported for extraversion. A different pattern of findings was observed when current drinking levels were considered. Higher extraversion and lower neuroticism scores were associated with higher mean levels of weekly drinking over the past month for males but not females.

The peripheral personality construct of locus of control has also been examined for its relationship with alcohol use. Much of the research on the relationship between control orientation and alcohol use has focussed on two areas in particular (Donovan & O'Leary, 1983). The first explores the differences in control orientation between alcoholics and non-problem drinkers. The second area of study focusses on the relationship between measures of control orientation and alcohol consumption.

The focus of studies in the first area was to determine whether alcoholics had a more internal or external locus of control than did non-problem drinkers. An internal locus of control is characterized by a belief that one's reinforcement depends upon one's own behavior, capacities or attributes in contrast to being determined by external factors believed to be beyond one's own personal control (Joe, 1971). The hypothesis is that alcoholics would have an external locus of control based on the view that they seem to lack control over their drinking behavior. Two reviews of the literature on control orientation and alcohol use (Donovan & O'Leary, 1983; Rohsenow & O'Leary, 1978) have criticized much of the early research for its methodological shortcomings. Among the most important criticisms are the various definitions used for alcoholics as well as the lack of comparable control groups. This has led to problems in interpreting results and to the difficulty in answering the question of the relative



internality/externality of alcoholics (Rohsenow & O'Leary, 1978).

The trend of results from better designed studies suggests support for the hypothesis of a more external control orientation for alcoholics compared to nonproblem drinkers. One of the earliest, better controlled studies compared two groups of excessive drinkers who were undergoing treatment for their drinking problems with two nonalcoholic control groups matched for age range and socioeconomic status. Male workers at a steel company who were being considered for promotions comprised one control group, and men visiting their local general practitioner's office constituted the other. The results indicated a more external control orientation for the alcoholics in comparison to the non-alcoholic controls (Butts & Chotlos, 1973). A subsequent study also provided support for the hypothesis that alcoholics are more external than non-problem drinkers (Caster & Parsons, 1977). Three samples of alcoholics who had been involved in an inpatient treatment program for alcoholism were found to report a more external orientation in relation to the outcomes of events in their lives in contrast to a group of nonalcoholics. This finding was consistent across the three alcoholic groups regardless of whether the patient had failed to complete treatment, had successfully completed the program or had continued in post-discharge, outpatient follow-up treatment.

With the exception of one study (Richman & Flaherty, 1986), the few studies that have investigated the relationship between measures of control orientation and indices of drinking behavior have provided further support for the link between external control and increased alcohol consumption. The distinguishing characteristic shared by these studies is their focus on the relationship between control orientation and the continuum of drinking behavior patterns. One study indicated an association between higher frequency of drinking and higher (more external) locus of control scores among male

university students (Apao & Damian, 1982). The results from other studies point to increasing externality as one progresses in drinking categories from abstainers to nonproblem drinkers to heavy problem drinkers (Mariano, Donovan, Walker, Mariano & Walker, 1989; Naditch, 1975).

The present study was designed to add to the literature on the relationship between various personality variables and the continuum of alcohol consumption levels in healthy, older, nonalcoholic individuals. Based on the findings from existing literature, it was hypothesized that higher levels of alcohol consumption would be associated with higher scores on a measure of extraversion, neuroticism and a more external control orientation.

#### Social support and involvement in activities

In line with the previous variables, there has been limited research focussing on the potential relationship between social support and the continuum of alcohol consumption use. The overall pattern of results from the available literature points to an inconsistent relationship between various measures of social support and parameters of alcohol consumption. In two recent studies from the same group of researchers, higher degree of satisfaction with one's available social support was associated with higher lifetime levels of social drinking for elderly male social drinkers (Chaikelson et al., 1987-88), and a larger social support network significantly predicted higher mean current drinking levels for elderly female social drinkers (Arbuckle et al., 1993). In contrast to social support, involvement in activities was not significantly associated with alcohol use. The findings suggest that drinking in the elderly may be primarily socially motivated. In contrast to these findings, the data obtained from the NADS indicated that older Canadians (55+) who lacked social support drank more per occasion than those individuals who reported having very helpful support networks (Eliany & Clarke, 1992). Similar findings were reported in another study

that examined the associations between social support and heavy drinking in a sample of elderly Swedish men (Hanson, 1994). The findings indicated that heavier drinking was associated with a less integrated social support network as well as less social contacts with friends and relatives. The beneficial effects of social support were demonstrated in a study that examined the relationship between social support and alcohol use in adult children of alcoholics. The findings indicated that subjects with a positive family history for alcoholism who reported low perceived social support had higher alcohol use and showed the greatest risk for developing alcohol problems (Ohannessian & Hesselbrock, 1993). A study examining sex differences and psychosocial correlates of drinking among medical students reported gender-related effects of amount of social support on alcohol consumption. Lower levels of social support were linked to greater wine consumption for men while women who reported high levels of social support consumed more wine (Richman & Flaherty, 1986). A fourth study compared the quantity and quality of social support resources across three groups (Brennan & Moos, 1991). The subjects in the three groups were categorized as nonproblem drinkers, early- or late-onset problem drinkers. The results indicated higher levels of social support resources (both degree of support and empathy received from that support) for nonproblem drinkers in contrast to the two groups of problem drinkers. This study also provided evidence for a continuum of effects characterized by higher social resources for nonproblem drinkers followed by late-onset and then early-onset problem drinkers with the least amount of social support resources.

The available data on the relationship between social support, activity level and alcohol consumption tend to indicate a more important role of social support in contrast to activity involvement in alcohol consumption patterns. Based on this literature, it was expected that satisfaction with one's available

social support would be a significant predictor of alcohol consumption levels. Higher support satisfaction levels would be associated with higher levels of alcohol consumption for this sample of non-alcoholic social drinkers. No significant effects were expected for involvement in socially oriented activities.

## Cognitive/Neuropsychological Functioning

### Alcohol consumption and cognitive functioning

Prolonged heavy alcohol use has been found to be associated with structural changes in the brain with the greatest changes occurring in the frontal lobes (Butters & Brandt, 1985; Giancola, Zeichner, Yarnell & Dickson, 1996; Pfefferbaum, Sullivan, Mathalon & Lim, 1997). Such structural changes imply changes in cognitive functioning as well. The major focus of the present study is on the potential cognitive risks that may be associated with more moderate levels of alcohol consumption after controlling for the effects of various sociodemographic, intellectual and psychosocial variables.

The rationale for the hypothesis of continuity of alcohol-related cognitive effects derives from a theoretical position originally proposed over two decades ago by Ryback (1971). This hypothesis suggests a continuum of alcohol effects that ranges from profound neuropsychological impairment seen in alcoholic Korsakoff patients through moderate deficits in chronic alcoholics and heavy social drinkers (Parsons, 1986). According to this continuity hypothesis, individuals with differing alcohol use patterns (from severe to moderate) represent separate points along a single continuum of alcohol-related cognitive or neuropsychological impairment (Alderdice & Davidson, 1990). Based on this hypothesis, the extent of cognitive deficits should increase progressively as

levels of alcohol consumption also increase.

The issue of a potential continuum of alcohol-related cognitive impairment led to the rapid proliferation of research focussing on the extent and nature of neuropsychological deficit from estimates of varying patterns of alcohol consumption among social drinkers. The tests used to evaluate neuropsychological functioning are tests that have been reported to present difficulties to alcoholic Korsakoff patients as well as male chronic alcoholics who do not present with the amnesic syndrome characteristic of Korsakoff patients. These tests typically reflect the cognitive processes of non-verbal abstraction, logical problem solving, concept formation and set flexibility (frontal lobe functions) and certain perceptual-spatial-motor abilities (Parker & Parker, 1982; Parsons & Farr, 1981; Parsons & Leber, 1981; Shaw & Spence, 1985; Tarter & Parsons, 1971; Tarter & Ryan, 1983). Cognitive functions seem to remain intact on simple memory tests such as the digit span subtest on the WAIS-R (reflective of temporal functioning) (Shaw & Spence, 1985) or tests of general verbal abilities (Yohman & Parsons, 1985).

Studies that have compared the neuropsychological functioning of alcoholics and non-alcoholic controls generally point to poorer performance by alcoholics on tests measuring frontal lobe functions. This finding suggests specificity of cognitive deficits associated with heavy alcohol consumption. However, some of these same studies have also revealed similar patterns of findings for other areas of cognitive functioning such as verbal abilities and memory (Beatty, Katzung, Nixon & Moreland, 1993; Cutting, 1978; Glenn & Parsons, 1992; Williams & Skinner, 1990). At this point, it remains unclear as to the specific (limited to frontal lobe functions) or more pervasive and nonspecific nature of alcohol-related cognitive impairment.

Parker and Noble (1977) were the first researchers to investigate an

extension of the continuity hypothesis to the social drinking range. A total of 102 male adults were categorized as infrequent, light/moderate or heavy social drinkers. Alcohol consumption measures included current frequency, current quantity per drinking occasion and lifetime consumption. Cognitive measures comprised tests reflective of abstracting and adaptive abilities, concept formation/shifting, and memory. The results from correlational analyses indicated no significant findings for the drinking variables of current frequency or lifetime consumption. Significant negative correlations were reported between current quantity of alcohol consumed per drinking occasion and sober cognitive performance on the tests of abstracting abilities, concept formation and set flexibility. The results are consistent with the specificity hypothesis of alcohol related cognitive deficits. Progressive increases in current quantity of alcohol consumed per drinking occasion across the three subgroups were associated with decreases in sober cognitive performance. A later study essentially replicated the above findings of an inverse relationship between current quantity of alcohol consumed per drinking occasion and sober cognitive performance on the same test of abstracting and adaptive abilities (Parker, Birnbaum, Boyd & Noble, 1980).

Since the publication of Parker and Noble's (1977) landmark study, a plethora of studies have attempted to replicate and extend the original findings. Efforts to extend the findings have mostly involved the inclusion of women in the subject samples so as to increase the generalizability of findings. A second area of focus involved the examination of potential differences in the nature of cognitive decline that is associated with aging in contrast to that observed with prolonged alcohol use. Cognitive loss that is associated with the aging process can serve as a yardstick for comparing cognitive deficits associated with drinking (Parker, Parker, Brody & Schoenberg, 1982). The rationale for the investigation

of this issue stems from studies of alcoholic patients that exhibited patterns of neuropsychological impairment that resembled those associated with normal aging. The term premature aging began to be used to emphasize that the combination of age and drinking might present a double risk for cognitive loss for older drinkers. Studies that have investigated the premature aging hypothesis have provided inconsistent results (Burger, Botwinick & Storandt, 1987; Cermak & Peck, 1982; Jones & Jones, 1980; Noonberg, Goldstein & Page, 1985; Page & Cleveland, 1987; Parker & Noble, 1980; Parker, Parker, Brody & Schoenberg, 1982; Ryan & Butters, 1980). As this research focussed on healthy, nonalcoholic elderly social drinkers, the issue of premature aging was not addressed in the present investigation.

Most of the studies that have attempted to replicate Parker and Noble's (1977) original findings have produced results suggestive of an inverse relationship between self-reported drinking and sober cognitive performance. More specifically, studies that have included the same cognitive tests in their neuropsychological test battery have reported inverse relationships between the drinking variable of quantity of alcohol consumed per occasion and poorer performance on abstraction and conceptual quotient of the Shipley-Hartford Institute for Living Scale (SILS; Shipley, 1940) and number of perseverative errors on the Wisconsin Card Sorting Test (WCST; Milner, 1963). These findings held across various adult samples ranging between 25 and 60 years of age (Lyvers & Maltzman, 1991; MacVane, Butters, Montgomery & Farber, 1982; Parker, Kaelber, Harford & Brody, 1983; Parker, Parker, Brody & Schoenberg, 1983). More specific patterns of findings were obtained in other studies that divided their samples into subgroups of light/moderate and heavy male and female drinkers. An inverse relationship was observed between quantity of alcohol consumed per drinking occasion and cognitive performance on the SILS

for the heavy drinkers but not for the light drinkers (Parker, Parker & Harford, 1991; Parsons & Fabian, 1982). Waugh, Jackson, Fox, Hawke & Tuck (1989) also reported significantly poorer performance on tests of problem solving, planning and organization, visuo-spatial processing and learning ability in their subgroup of male heavy drinkers (up to 130g of alcohol/day) in contrast to their lighter drinking counterparts. The results from these studies seem to be in line with the continuity hypothesis of alcohol-related cognitive impairments. However, there has been limited success in replicating the exact pattern of findings on the same measures from one study to the next. A number of inconsistencies across studies ranging from differences in sampling techniques to drinking parameters such as type of beverage consumed, cautions against premature and final acceptance of the data and the validity of the hypothesis at this point.

In addition to an inverse relationship between quantity of alcohol consumed per drinking occasion and poorer SILS or WCST performance, studies have also reported a similar pattern of findings for other alcohol consumption variables such as lifetime alcohol consumption and frequency of consumption (Arbuckle, Chaikelson & Gold, 1994; Hannon, Butler, Day, Khan, Quitoriano, Butler & Meredith, 1987; Hannon, Day, Butler, Larson & Casey, 1983) as well as for other cognitive measures including WAIS- digit symbol and Trailmaking B from the Halstead Reitan Neuropsychological Test Battery (Halstead, 1947; Reitan & Davison, 1974). Despite these seemingly positive results, additional findings in the unexpected direction were also reported for frequency of alcohol consumption (higher frequency associated with better cognitive performance). This last set of findings in conjunction with the lack of significant results reported in other studies warrant caution against definitive conclusions and generalizations (Alterman & Hall, 1989; Bergman, 1985).

Despite the inconsistencies in findings across some studies and the failure



of other studies to find any cognitively-related effects of social drinking (Alterman & Hall, 1989; Emmerson, Dustman, Heil & Shearer, 1988; Jones-Saumty & Zeiner, 1985), the literature on the relationship between social drinking and neuropsychological functioning generally indicates a detrimental effect of alcohol use on various cognitive functions and abilities. The present study provided the opportunity to explore whether a dose-response relationship between alcohol consumption levels and cognitive functioning as espoused by the continuity theory would extend to elderly social drinkers. If such a dose-response relationship extends to light social drinkers, increasing levels of alcohol consumption within the present social drinking range should be associated with poorer performance on indices of cognitive functions obtained at initial testing and follow-up. In addition, within the context of examining the relevance of continuity theory to the social drinking range, this study also provided a testing ground for investigating the specificity of alcohol-related cognitive deficits to frontal functions.

#### Sociodemographic covariates of neuropsychological functioning

Based on the age-related declines commonly seen in physical abilities, a logical extension is the assumption of similar age-related effects in cognitive functions. The available research that has focussed on the relationship between age and cognitive functioning has generally reported stability in various cognitive functions (Cockburn & Smith, 1991; Craik, 1977; Gold, Andres, Etezadi, Arbuckle, Schwartzman & Chaikelson, 1995; Rabbitt, Donlan, Watson, McInnes & Bent, 1995; Schaie & Willis, 1993). In relation to the variable of education, higher levels of education have been associated with greater maintenance of performance on tests of various cognitive functions including conceptualization, memory and problem-solving (Albert, Jones, Savage, Berkman, Seeman, Blazer

& Rowe, 1995; Arbuckle, Gold & Andres, 1986; Gold et al., 1995; Inouye, Albert, Mohs, Sun & Berkman, 1993; Jones, Albert, Duffy, Hyde, Naeser & Aldwin, 1991; Kesler, Denney & Whitely, 1976; Luszcz, 1992; Shichita, Hatano, Ohashi, Shibata & Matuzaki, 1986). The literature on the relationship between gender and cognitive functioning generally indicates no significant gender differences in cognitive functioning (Cockburn & Smith, 1991). Shanan & Sagiv (1992) reported that gender differences are eliminated when men and women are matched on variables of education and occupational experience. Other studies have focussed on the relationship between self-reported health and cognitive performance. The results from such studies indicate no clear relationship between physical health and cognitive functioning with some studies reporting a positive relationship between good physical health and cognitive performance (Field, Schaie & Leino, 1988; Hultsch, Hammer & Small, 1993; Perlmutter & Nyquist, 1990). In contrast, other studies have reported no significant relationship between measures of health and various cognitive measures (Cockburn & Smith, 1991; Luszcz, 1992; Salthouse, Kausler & Sauls, 1990).

Based on the above findings, secondary hypotheses predicted age-related declines in performance on cognitive measures and a positive relationship between the variables of education (used in this study as an index of socioeconomic status) and cognitive functioning. Positive effects of self-reported health on cognitive functioning were also expected. No gender differences in cognitive performance were expected. These predicted relationships were expected to hold for indices of frontal and temporal cerebral functioning. In studies examining the effects of alcohol use on cognitive functioning, it is important to control for the effects of these factors (Parsons, 1986).

### Intelligence and cognitive functioning

In addition to sociodemographic and psychosocial covariates, this study also included intelligence as a control variable in the analyses focussing on the relationship between alcohol use and cognitive functioning. In this study, psychometric intelligence was defined as ability functions falling into the two categories of crystallized and fluid intelligence (Horn, 1982). According to Baltes (1993), fluid-like mechanics involve speed and accuracy of sensory information input, visual and motor memory as well as processes involving discrimination, comparison and categorization. Conversely, crystallized pragmatics (Baltes, 1993) reflect culture-based knowledge and experience. Examples of crystallized abilities include verbal comprehension, reading and writing skills, concept formation, logical and general reasoning. The literature on intelligence has reported different developmental patterns for crystallized and fluid abilities. Crystallized abilities appear to remain stable across adult years in contrast to fluid abilities that seem to begin to decline much earlier (Cockburn & Smith, 1991; Cunningham & Tomer, 1990; Denney, 1982; Lovelace, 1990; Sternberg & Berg, 1987). The available research that has investigated the issue of maintenance or decline of intellectual abilities with aging has provided evidence consistent with the relative stability in crystallized ability in contrast to the age-related decline in performance on tests of fluid ability (Arbuckle, et al., 1993; 1994; Cockburn & Smith, 1991; Field, et al., 1988; Gold, et al., 1995; Hultsch, Hertzog, Small, McDonald-Miszczak & Dixon, 1992; Owens, 1966; Perlmutter & Nyquist, 1990; Rabbitt et al., 1995; Schaie & Willis, 1993; Schwartzman et al., 1987). In this study, intelligence was measured by the vocabulary subtest of the Revised Examination "M" (Schwartzman et al., 1987), a measure of intelligence and aptitude developed for the Canadian Army during World War II. The vocabulary subtest is a timed test of verbal skills that was chosen because it samples

primarily more stable crystallized ability.

A number of studies have also provided evidence of a relationship between measures of intelligence and cognitive functioning. In a recent study by Arbuckle et al. (1992), current M-Test scores were found to be predictive of performance on four measures of memory including free and cued recall, recognition memory and forward digit span in a group of elderly individuals. Higher M-Test scores were associated with better performance on all memory measures. A later study by Arbuckle et al., (1993) reported that current M-Test vocabulary scores uniquely accounted for the greatest proportion of variance in measures of cognitive flexibility in older men and women. Higher vocabulary scores were associated with greater cognitive flexibility. An individual's current vocabulary score was also a significant predictor of better performance on measures of verbal and visual memory. Another study reported that a measure of fluid intelligence was a good predictor of everyday memory tasks in 70-93 year olds (Cockburn & Smith, 1991). These findings emphasize the importance of including intelligence as a control variable in any analysis predicting cognitive functioning. For this study, intelligence as measured by vocabulary scores was expected to emerge as a significant predictor of cognitive functioning.

#### Psychosocial covariates of cognitive functioning

Previous research has examined the relationship between psychosocial variables and cognitive functioning. For this study, the interest in these variables consisted primarily of controlling their effects on cognitive functioning in order to assess more adequately the relationship between alcohol consumption and cognitive functioning. The results from available research that have examined the potential relationship between the central personality variable of introversion/extraversion and cognitive functioning generally indicate a low,

negative relationship between extraversion and various indices of cognitive functioning (Arbuckle et al., 1993; Arbuckle et al., 1986; Costa, Fozard, McCrae & Bossé, 1976; Gold et al., 1995; Nunn, Bergmann, Britton, Foster, Hall & Kay, 1974). In a discussion of these findings, Gold and Arbuckle (1990) agreed with Eysenck (1981) that introverts have a greater capacity for introspection. This capacity allows for more attention, more intensive processing of incoming information and reflection that in turn may facilitate cognitive performance of introverted older adults on both verbal and nonverbal tasks.

Studies that have examined the relationship between neuroticism and cognitive functioning have also indicated that neuroticism is associated with poorer outcomes on a number of cognitive measures including memory, verbal and nonverbal functions as measured on intelligence tests, and pattern analysis (Arbuckle et al., 1995; Arbuckle et al., 1986; Costa, Fozard et al., 1976; Gold et al., 1995; Jorm, MacKinnon, Christensen, Henderson, Scott & Korten, 1993; Nunn et al., 1974).

Research that has examined the relationship between the peripheral personality trait of locus of control and cognitive functioning (Gold & Arbuckle, 1990; Lachman, 1983) has provided more inconsistent findings than for the central personality traits. The results from some studies point to the positive influence of internal locus of control on various cognitive measures reflective of frontal and temporal cortical functions. These include verbal functions (Brown & Granick, 1983; Gold et al., 1995), various tests of memory functions (Arbuckle, Gold, Andres, Schwartzman & Chaikelson, 1992) and dimensions of general reasoning, memory span, perceptual speed and crystallized knowledge (Lachman, 1986; Lachman, Baltes, Nesselroade & Willis, 1982). Other studies have reported no relationship between locus of control and verbal memory (Arbuckle et al., 1986).

Research that has examined the relationship between involvement in activities and cognitive functions has provided evidence generally favoring a positive influence of an active lifestyle on various cognitive measures. Elderly individuals who experienced a high level of cognitive activity in their daily environments showed better performance on cognitive tests of word generation, paired associates and word recall in contrast to elderly individuals who lived in less cognitively demanding environments (Craik, Byrd & Swanson, 1987). Other studies have reported that maintenance of an intellectually active and engaged lifestyle helps to retain cognitive competence later in life (Arbuckle et al., 1986; Arbuckle et al., 1993; Cockburn & Smith, 1991; Gold et al., 1995; Hultsch et al., 1993). In addition to involvement in intellectually oriented activities, there is also evidence favoring a relationship between participation in socially oriented activities and various cognitive measures including delayed recall (Smits, Van Rijsselt, Jonker & Deeg, 1995). In contrast to an engaged lifestyle, a study reported negative correlations between a disengaged lifestyle (characterized by passive, solitary activities, low involvement in people-related and work activities) and various cognitive abilities across the lifespan (Gribbon, Schaie & Parham, 1980). Studies that examined the relationship between levels of activity and cognitive functioning in nursing home residents also revealed similar findings. The studies reported positive correlations between levels of activity and various measures reflecting temporal and frontal cortical functions (Kuypers, 1972; Powell, Milligan & Furchtgott, 1984; Winocur, Moscovitch & Freedman, 1987).

The limited research that has examined the relationship between social support and cognitive functioning has provided inconsistent findings. One study that included social support in their battery of measures reported that individuals who were satisfied with their social supports showed less intellectual decline and better performance on memory tasks (Arbuckle et al., 1993). A later study

evaluated the effects of various demographic, physical and psychosocial variables on cognitive functioning and cognitive change over time (Albert et al., 1995). The results indicated no significant effects of available social networks or emotional support received on either cognitive measure.

Based on the available literature, it was hypothesized that extraversion and neuroticism would be negative predictors of cognitive performance. Internal locus of control and involvement in activities would be positively associated with cortical functioning.

### Well-Being

The concept of well-being and its correlates has received considerable attention in the psychosocial literature on aging over the last two decades. The literature has been marked by a number of terms used somewhat interchangeably for the construct of well-being. As a result, well-being has become a synonym for constructs such as psychological well-being, happiness, wellness, life satisfaction and morale (Cowen, 1991; Diener, 1984; Larson, 1978; Lawton, 1983; Lawton, Kleban & DiCarlo, 1984; Veenhoven, 1991). Despite the lack of agreement over the precise definition of well-being (Zautra & Hempel, 1984), there is an emerging consensus that subjective well-being consists of various dimensions including affective as well as cognitive components (Argyle, 1987; Bryant & Veroff, 1982; Feist, Bodner, Jacobs, Miles & Tan, 1995; Shmotkin & Hadari, 1996; Stock, Okun & Benin, 1986; Veenhoven, 1991).

In a review of the literature on subjective well-being, Diener (1984) discusses the three hallmarks of the concept of subjective well-being. The first aspect of the concept is that well-being is subjective. The emphasis is on the individual's perceptions of their experiences rather than objective conditions.

Empirical support for this issue has been provided by early and more recent studies that have attempted to link sociodemographic variables (gender, marital status, education, work) to well-being. In general, such studies have found that objective indicators account for a minimal portion of the observed variance in well-being with zero order correlations in the .20 to .30 range (Baur & Okun, 1983; Costa, McCrae & Zonderman, 1987; Hoyt, Kaiser, Peters & Babchuk, 1980; Kozma & Stones, 1983; Liang, 1982; Palmore & Kivett, 1977). On the basis of these findings, research efforts have shifted to the identification of psychosocial variables as potential correlates and predictors of subjective well-being.

The second general aspect of the definition is that well-being encompasses the full range of the affective continuum from positive to negative states (Stock et al., 1986). The recent literature has indicated that positive and negative affect dimensions of well-being are not correlated that highly (Baker, Zevon & Rounds, 1994; Bradburn, 1969; Carp & Carp, 1983; Diener & Emmons, 1984; Diener, Larsen, Levine & Emmons, 1985; Diener, Sandvik & Pavot, 1991; Lawton, Kleban, Rajagopal & Dean, 1992; Warr, Barter & Brownbridge, 1983). Related to this issue, other studies have demonstrated empirically the distinction between well-being (associated with measures of positive affect, satisfaction) and ill-being (associated with measures of negative affect, somatic complaints and worries) (Headey, Holström & Wearing, 1984; 1985). This evidence encourages the use of measures that would include the diverse attributes of well-being such as positive and negative affect.

Third, the cognitive component of subjective well-being typically involves a global appraisal of an individual's quality of life (Argyle, 1987; Diener, 1984; Veenhover, 1991). There have been a number of questions concerning whether this global assessment represents the sum total of satisfaction with several life



domains (family, occupation, housing) or whether well-being reflects a general tendency to view one's life in a positive light (Stones & Kozma, 1980; 1989). These two opposing models of subjective well-being have been termed the 'bottom-up' and 'top-down' views (Diener, 1984; Okun, Olding & Cohn, 1990). Evidence in support of the 'bottom-up' view stems from qualitative research indicating satisfaction with various life domains such as health, family, career, as the most important elements contributing to an overall sense of well-being in women (Bearon, 1989). There is also evidence in support of the latter propensity formulation (Stones & Kozma, 1980; 1989) or 'top-down' view (Diener, 1984). This opposing viewpoint holds that some individuals are dispositionally happier than others and that this disposition will color how they interpret their life experiences (Headey & Wearing, 1989; 1991; Hotard, McFatter, McWhirter & Stegall, 1989; Zika & Chamberlain, 1987). The evidence favoring the 'top-down' view stems from longitudinal studies reporting stability of mean levels and total variance accounted for in various measures of well-being (Andrews, 1991; Baur & Okun, 1983; Costa, McCrae, & Zonderman, 1987; Costa, Zonderman, McCrae, Comoni-Huntley, Locke & Barbano, 1987; Field & Millsap, 1991; Kozma & Stones, 1983; Mussen, Nonzik, & Eichorn, 1982; Palmore & Kivett, 1977; Recker & Wong, 1984). In addition to the above literature, the results from a recent study have indicated support for both models of subjective well-being (Feist et al., 1995).

### Alcohol consumption and well-being

An issue to be addressed in this study concerned the potential effects of moderate levels of alcohol consumption on the individual's sense of well-being while controlling for the effects of various sociodemographic and psychosocial factors. The consequences of heavy alcohol use on physical health have been

well publicized, however this extensive research has not been paralleled by similar studies focussing on alcohol use and psychological well-being in older individuals. The lack of research is even more salient in the area examining the potential link between social drinking and subjective well-being in the elderly.

One of the earliest studies in this area examined the relationship between drinking behavior and life satisfaction in seven areas of life (Hingson, Scotch, Barrett, Goldman & Mangione, 1981). The domains of life included work, relationships with children, spouse and other family, close friendships, leisure, and finances. A sample of 5273 adults in the Boston metropolitan area provided data on average daily alcohol consumption over the past year. The results indicated little or no association between average daily alcohol consumption and level of satisfaction in 6 out of 7 areas of life. The strongest association reported was a negative relationship between daily alcohol use and satisfaction with marital relationships. Those individuals who were less satisfied with their marital or romantic relationship were more likely to report higher daily consumption of alcohol.

The results from later studies provide further inconsistent evidence for the relationship between alcohol consumption and well-being. One study reported that elderly, non-alcoholic males were more satisfied with various salient dimensions of daily functioning in contrast to elderly alcoholics (Gold et al., 1991). In a second study of 214 elderly women, lifetime and current alcohol use had no effect on perceived self-efficacy and general well-being (Arbuckle et al., 1993). A later study examined the effects of lifetime and current drinking on three measures of well-being in a sample of 30-59 year old women. The three measures of well-being comprised self-esteem, mastery and depression. Maximum lifetime drinking levels only predicted lower self-esteem (Arbuckle et al., 1995). A study that investigated the antecedents and correlates of drinking in early- and late-onset elderly alcohol abusers reported an inconsistent pattern of

findings for various measures of alcohol consumption and life satisfaction (Schonfeld & Dupree, 1991). Specifically, no relation was found between life satisfaction and two measures of alcohol consumption (number of days drinking out of 30 days or quantity of alcohol consumed on an average day of drinking). The number of days an individual reported being intoxicated over a specific 30-day period was the only alcohol consumption measure to show a modest, negative correlation with life satisfaction. A more recent study investigated the effects of a number of health practices (smoking, alcohol consumption, activity level) on life satisfaction as a measure of psychological well-being in a sample of 5102 elderly Canadians (Gillis & Hirdes, 1995). Alcohol consumption, operationalized as the number of drinks consumed during the last week prior to testing, had no effects on psychological well-being.

The lack of studies investigating the relationship between social drinking and subjective well-being in older individuals is quite evident. The results from the few available studies point to inconsistent findings. This pattern of results may stem from methodological differences found across the studies that range from the type of population to the various measures of alcohol consumption that were employed. This relative lack of research coupled with the existing inconsistent findings underlie the need for further research in this area and make it difficult to present specific hypotheses regarding the relationship between social drinking and subjective well-being.

#### Demographic variables and subjective well-being

A main focus of this research was the exploration of the relationship between alcohol use and subjective well-being in a sample of older social drinkers while controlling for the effects of demographic factors on subjective well-being. The study included the standard demographic variables of age,

gender, education, marital status and self-rated health as control variables. Reviews of the literature on subjective well-being report weak or inconsistent relationships between measures of subjective well-being and standard demographic variables (Andrews & Robinson, 1991; Diener, 1984; Larson, 1978). This relationship holds across a number of demographic variables and measures of subjective well-being.

The literature that has examined the relationship between demographic variables and subjective well-being generally points to inconsistent findings for the relationship between the demographic variable of age and subjective well-being. A few studies have reported a positive relationship between age and various indices of subjective well-being (Argyle, 1987; Horley & Lavery, 1995; Lu, 1995; Medley, 1980; Mookherjee, 1992; Tran, 1992; Tran, Wright & Chatters, 1991). In contrast, studies that have examined the issue of longitudinal stability of subjective well-being generally report no age-related changes in either levels of happiness or life satisfaction (Baur & Okun, 1983; Costa, McCrae & Zonderman, 1987; Costa, Zonderman, McCrae, Comoni-Huntly, Locke & Barbano, 1987; Field & Millsap, 1991; Kozma & Stones, 1983; Palmore & Kivett, 1977; Stacey & Gatz, 1991). In addition, other studies examining the influence of various demographic and psychosocial variables on subjective well-being also report a lack of significant effects of age on subjective well-being (Blanford & Chappell, 1990; Dillard, Campbell & Chisolm, 1984; Gupta & Korte, 1994; Hickson, Housley & Boyle, 1988; Kehn, 1995).

A similar pattern of inconsistent findings is reported in the research examining potential gender differences in subjective well-being. A few studies have reported gender differences in levels of satisfaction and happiness (Coke, 1992;; Costa, McCrae et al., 1987; Field & Millsap, 1991; Hickson et al., 1988). But the bulk of the evidence indicates no gender-related differences on various

measures of subjective well-being (Argyle, 1987; Blanford & Chappell, 1990; Furnham & Brewin, 1990; Kehn, 1995; Lai, 1995; Leonard, 1981-1982; Liang, 1982; Lu, 1995; Mookherjee, 1992; Wister & Strain, 1986).

Mixed results also characterize the literature on the relationship between education and subjective well-being. Some studies have indicated that individuals with higher levels of education report being more satisfied with their lives (Coke, 1992; Dillard et al., 1984; Gray, Ventis & Hayslip, 1992; Leonard, 1981-1982. Lu, 1995. Markides & Martin, 1979; Mookherjee, 1992; Veroff, Douvan & Kulka, 1981). In contrast, the results from other studies have indicated a lack of significant relationships between education and measures of life satisfaction or happiness (Kehn, 1995; Tran et al., 1991; Usui, Keil & Durig, 1985).

The research literature on the relationship between marital status and subjective well-being generally falls into two categories. The studies that have reviewed data obtained from national samples and surveys indicate that on the average, married individuals tend to enjoy higher levels of subjective well-being than the never married, divorced or widowed (Argyle, 1987; Costa et al., 1987; Veroff et al., 1981). Two more recent reviews (Glenn & Weaver, 1988; Mastekaasa, 1993) corroborate this positive finding for older individuals but have found a trend for differences in self-reported happiness to have decreased between married and non-married groups among younger individuals. The second major area of study on the marital status and subjective well-being link has focussed on marital status as a correlate or predictor of subjective well-being. With the exception of a few studies that have found no relationship between marital status and subjective well-being (Blanford & Chappell, 1990; Lai, 1995; Palmore & Kivett, 1977), most studies have provided evidence of a positive relationship between being married and various indices of subjective well-being

(Argyle & Martin, 1991; Ducharme, 1994; Gove, Hughes & Style, 1983; Horley & Lavery, 1995; Kehn, 1995; Kozma & Stones, 1983; Leonard, 1981-82; Mookherjee, 1992; Tran, 1992; Tran et al., 1991). This finding has been attributed mainly to older populations but has also been reported for younger samples.

The findings on the relationship between health and subjective well-being are clearer. Health is an important aspect of subjective well-being especially for older people (Argyle, 1987). Although no study has focussed exclusively on the relationship between health and subjective well-being (Okun, Stock, Haring & Witter, 1984), available studies that have examined health as a correlate of subjective well-being in the elderly have reported a significant, positive relationship between the two variables. In these studies, better health was positively associated with higher levels of well-being as measured by indices of life satisfaction, happiness or morale (Baur & Okun, 1983; Bearon, 1989; Blanford & Chappell, 1990; Brief, Butcher, George & Link, 1993; Gray, Ventis & Hayslip, 1992; Gupta & Korte, 1994; Horley & Lavery, 1995; Kehn, 1995; Kozma & Stones, 1983; Lai, 1995; Markides & Martin, 1979; Mussen, Honzik, & Eichorn, 1982; Palmore & Kivett, 1977; Spreitzer & Snyder, 1974; Tran, 1992; Tran et al., 1991; Usui et al., 1985; Ziegler & Reid, 1983) while worse functional health has been related to psychological distress (Markides & Lee, 1990). It is important to note that studies that have reported such positive relationships between the two variables have mostly used subjective measures of health such as self-rated health in contrast to more objective types of health measures (Lawton, 1984). The superiority in predictive ability of subjective measures of health such as self ratings in contrast to more objective indices has been confirmed in reviews that have focussed on the relationship between health status and subjective well-being (Okun, et al., 1984; Zautra & Hempel, 1984). On the basis of the available

literature, it was hypothesized that lower levels of self-reported symptomatology (indicating better health status) would be significantly and positively related to overall happiness or well-being as measured on the Memorial University of Newfoundland Scale of Happiness (MUNSH).

### Psychosocial factors and subjective well-being

The transition in the focus of research on well-being from sociodemographic to psychosocial correlates of subjective well-being has been associated with a surge in the psychosocial literature on this topic. Among the factors most frequently studied are the personality dimensions of extraversion and neuroticism (Eysenck & Eysenck, 1968; Eysenck, 1981), internal-external locus of control (Reid & Ziegler, 1980), social support, and involvement in activities. The present study focussed on the relationship between alcohol use and subjective well-being while controlling for the effects of these psychosocial variables.

### Extraversion

Previous research has shown an association between personality and happiness (Wilson, 1967). Extraversion has been consistently found to emerge as a correlate of happiness or satisfaction (Argyle, 1987; Costa & McCrae, 1980). Eysenck and Eysenck (1968) originally described the typical extravert as sociable, impulsive, active and optimistic in contrast to the introvert who is quiet, introspective and enjoys planning. Additional descriptors such as affectionate and talkative have been ascribed to extraverts in contrast to introverts who are described as reserved, passive and loners (Costa & McCrae, 1986).

Studies have shown extraversion to be longitudinally stable in adults over a 6 to 19 year period with high correlations found across various personality questionnaires and methods of assessment (Conley, 1985; Costa, McCrae & Arenberg, 1980; Costa & McCrae, 1988). The findings support Costa and

McCrae's (1988) contention that personality is stable after age 30. This position of the stability of extraversion is further reinforced by a study on adult twins raised apart (Pedersen, Plomin, McLearn & Friberg, 1988). The results of this study indicated that 41% of the variance in extraversion scores was attributable to heritability in adult monozygotic twins raised apart. This finding strongly suggests a genetic component for extraversion. With the exception of one longitudinal study that found a slight decrease in extraversion scores in groups of old-old (74-84 years of age) and oldest-old (85-93) subjects (Field & Millsap, 1991), the major findings in this area suggest stability in extraversion. The findings further imply that extraversion scores gathered at any time during adulthood are a good reflection of an individual's level of extraversion throughout the adult lifespan. In this research, the levels of extraversion reported by elderly subjects at one point in time in the present investigation were assumed to be stable and reflective of their levels of extraversion in previous years.

Research on the relationship between extraversion and subjective well-being has consistently shown a positive association between extraversion and subjective well-being. The well-established independence between positive and negative affect dimensions of subjective well-being has led to the examination of the differential relationships that may exist between various personality variables and the two affective dimensions of well-being. In relation to extraversion, studies that have adopted such a design have provided evidence of a positive relationship between extraversion and positive affect. The relationship holds for both concurrent and longitudinal relationships and covers the age range across the adult lifespan.

A series of cross-sectional studies undertaken with undergraduate students reported findings of a positive correlation between extraversion and various measures of happiness used as an index of subjective well-being (Argyle



& Lu, 1990; Furnham & Brewin, 1990; Pavot, Diener & Fujita, 1990).

Extraversion was also found to correlate positively with a composite measure of positive affect (Emmons & Diener, 1985) as well as with daily positive affect and Bradburn's Positive Affect Scale (1969) (Emmons & Diener, 1986). In a study investigating the interactive effects of extraversion, neuroticism and social relationships on subjective well-being, extraversion emerged as a powerful predictor in all regression analyses of subjective well-being (Hotard et al., 1989).

The positive association between extraversion and subjective well-being evidenced in young adults also extends to older individuals. Positive relations between concurrent levels of extraversion and subjective well-being have been reported in older adults (Adkins, Martin & Poon, 1996; Costa, McCrae & Norris, 1981; Diener, Sandvik, Pavot & Fujita, 1992; Lu, 1995). In addition to cross-sectional research, longitudinal studies have also provided evidence of a positive association between extraversion scores and measures of positive affect as well as other global indices of subjective well-being obtained 7 to 17 years later (Costa and McCrae, 1980; Costa et al., 1981; McCrae & Costa, 1991). These results led to the conclusion that extraversion may predispose individuals towards positive affect or well-being (Costa & McCrae, 1980).

The data from studies on the link between extraversion and well-being provide support for a positive relationship between the two factors. In this study, extraversion was expected to show a positive contribution to overall happiness as measured on the MUNSH.

### Neuroticism

Neuroticism (Eysenck & Eysenck, 1968) is the second major personality dimension that has been identified as an important contributor to the personality and well-being link. The individual high in neuroticism has been described as emotionally labile and overreactive, with a tendency toward somatization under

stressful conditions (Eysenck & Eysenck, 1968). The neurotic individual is also described as someone who tends to worry, who is self-conscious and vulnerable (Costa & McCrae, 1986).

Studies that have provided evidence for the stability of extraversion have also reported high levels of stability for neuroticism. Such studies have reported stability in self ratings and spouses' ratings of neuroticism for periods ranging from 6 to 19 years (Conley, 1985; Costa & McCrae, 1980; Costa & McCrae, 1988). The research by Pedersen and colleagues (1988) on adult twins raised apart provides support for a genetic component to neuroticism and further attests to neuroticism as an enduring and stable personality trait. This strengthens confidence that scores on the neuroticism measure obtained in the present investigation are reliable and reflective of the individual's level of neuroticism in general.

In contrast to extraversion which shows a positive relationship with global subjective well-being as well as positive affect, neuroticism has been found to have the opposite association with well-being. More specifically, cross-sectional and longitudinal studies have demonstrated a negative relationship between neuroticism and subjective well-being (Costa et al., 1981; Diener et al., 1992; Hotard et al., 1989; Lu, 1995). When subjective well-being is broken down into positive and negative affect, research has shown a positive relationship between various measures of neuroticism and negative affect (Costa & McCrae, 1980; Emmons & Diener, 1985;1986; McCrae & Costa, 1991). This relationship holds across gender and for different age groups throughout the adult lifespan.

Based on available data, it was expected that neuroticism would emerge as a significant negative predictor of overall subjective well-being as measured on the MUNSH.

## Locus of Control

The concept of locus of control describes the degree to which individuals believe that their reinforcement is contingent on their own behavior, capacities or attributes (internal locus of control) or are beyond personal control and are determined by external factors such as luck or powerful others (external locus of control) (Joe, 1971). The extent of control that one believes to have in one's life has been shown to be an important factor for well-being with loss of personal control potentially leading to dysfunctional behavior and emotional maladjustment (Reid, Haas & Hawkings, 1977). The issue of perceived loss of control in one's life is assumed to be important for the elderly due to declines in various areas of functioning such as physical health and the change in or loss of previously held roles in various life domains such as work and family. The study of perceived loss of control in relation to well-being in the elderly is therefore considered to be a noteworthy area of investigation.

Locus of control has been treated as a stable personality variable (Lachman, 1986). Despite this commonly held view, research on the stability of locus of control across the adult lifespan has met with mixed results. Some cross-sectional studies have reported an increase in internality with age (Staats, 1974), while others indicated decreases in internality and increases in externality (Hale & Cochran, 1986). Still others have reported no age differences (Nehrke, Hulicka & Morganti, 1980). A third pattern of findings indicates an increase in internality with age followed by decreases (Morganti, Nehrke, Hulicka & Cataldo, 1988; Ryckman & Malikiosi, 1975) or stability in levels following the initial increases (Knoop, 1981).

The diversity of assessment devices used to measure locus of control and the potential multidimensionality of the construct may have contributed to the inconsistent findings. Studies that distinguished between various dimensions of

control have indicated differential patterns of findings for these dimensions and their relationships with psychosocial variables (Lachman, 1986; Nurmi, Pulliainen & Salmela-Aro, 1992). Lachman (1986) used a locus of control battery that included one generalized and two domain specific instruments for health and cognitive functioning. The results indicated no significant age differences for the generalized measure of control but age differences were noted for domain specific measures. The elderly who obtained high scores on the powerful others scale of control displayed poorer performance on measures of cognitive functioning and worse health as reflected by more frequent doctor visits. In a survey of goals and concerns completed with 381 adults between the ages of 19 and 71, control beliefs became more external with age for certain areas of concern such as the self, health and their children's lives. No age differences for control beliefs were observed for goals concerning areas of family, occupation, future education and travel. The authors concluded that part of the increase in externality may have been caused by the increasing importance of specific domains that are generally considered uncontrollable (Nurmi et al., 1992).

The psychosocial literature has pointed to a link between locus of control and well-being. Specifically, a more internal locus of control has been associated positively with psychological well-being while a more external locus of control is negatively linked to measures of subjective well-being. With the exception of one study (Nehrke et al., 1980), the bulk of the evidence from cross-sectional studies completed with subjects covering the adult lifespan indicates a positive relationship between an internal locus of control and various measures of well-being including life satisfaction (Brown & Granick, 1983; Hickson et al., 1988; Lai, 1995; Wolk & Kurtz, 1975), happiness (Larson, 1989; Reid et al., 1977) and subjective well-being (Roberts, Dunkle & Haug, 1994; Zika & Chamberlain, 1987). The results from research conducted with institutionalized elderly

residents are also in line with these findings. Data from these studies indicated higher levels of happiness when residents were allowed more control over their choices and responsibilities (Langer & Rodin, 1976). In contrast, low internality was associated with lower levels of happiness and morale (Fawcett, Stonner & Zepelin, 1980; Reid et al., 1977).

Evidence from longitudinal research on locus of control and well-being is consistent with that of cross-sectional studies. A series of studies was designed to test the validity of a measure for Desired Control in a group of elderly individuals (Reid and Ziegler, 1980). This measure comprises a subscale for desire that includes items reflecting values that are placed on various reinforcements. The second subscale, labelled expectancy or belief, reflects the degree to which an individual feels that each reinforcement can be obtained. Three scores can be derived from this scale including a score for desire, expectancy/belief and a total desired control score that consists of the sum of cross-products of scores on each expectancy and corresponding desire item. The results indicated that high scores on the Desired Control Measure (suggesting internality) correlated positively with measures of life satisfaction obtained concurrently and one year later. The pattern of results also suggested that the effect was due to the individual's expectancy and belief of whether or not the desired outcome could be realized.

A subsequent longitudinal study by the same authors essentially replicated their earlier findings (Ziegler & Reid, 1983). A sample of 79 elderly subjects completed a battery of questionnaires that included measures of desired control, activity, life satisfaction, psychomotor speed, life changes and health. The results indicated that scores obtained on the Desired Control Measure correlated positively with scores on a measure of life satisfaction obtained at three points in time. The association persists over time with scores on Desired Control at Time

1 predicting life satisfaction 6 and 18 months later. A third longitudinal study provided further evidence of a concurrent and predictive positive association between internal locus of control and positive affect (Abbey & Andrews, 1985).

On the basis of previous results with the Desired Control Measure (Reid & Ziegler, 1980; Ziegler & Reid, 1983), it was hypothesized that an internal locus of control on the expectancy or belief component would significantly contribute to overall well-being as measured on the MUNSH.

### Social support

Social support has been recognized as an important factor in the maintenance of physical and psychological well-being for several decades (Cobb, 1976; Suls, 1982). Yet, review of the gerontological literature on the social support and well-being link indicates that findings remain contradictory and inconclusive. Reflective of this inconsistency, some studies report no general relationship between social support and well-being (Bowling & Browne, 1991; Cohler & Lieberman, 1980; Conner, Powers & Bultena, 1979; Ingersoll-Dayton & Antonucci, 1988; Strain & Chappell, 1982) while others present evidence favoring such a relationship (Edwards & Klemmack, 1973; Graney, 1975; Gupta & Korte, 1994; Holahan & Holahan, 1987; Larson, Mannell & Zuzanek, 1986; Levitt, Antonucci, Clark, Rotton & Finley, 1985-86; Levitt, Clark, Rotton & Finley, 1987; Lu, 1995; McGloshen & O'Bryant, 1988; Wood & Robertson, 1978).

Part of the explanation for this lack of consensus may be found in the different definitions and measures of social support that have been employed. Conceptualization of social support has shifted from a unidimensional to a multidimensional view of the construct. Definitions of the construct have included a single, quantitative element of support (such as number of individuals in the social network) while others have incorporated qualitative elements as well

(satisfaction with available support, types of support such as emotional and instrumental) (Cobb, 1976; Sarason, Levine, Basham & Sarason, 1983; Thoits, 1982). According to Cobb (1976), social support consists of information that leads individuals to believe that they are loved and cared for, esteemed and valued as well as being members of a network encouraging mutual obligation and reciprocal help. The same elements of socioemotional sustenance and instrumental aid can be found in Thoits' (1982) definition of social support. In order to understand adequately any associations observed between social support and well-being, it is believed necessary to capture and distinguish between the various dimensions of social support (Conner et al., 1979).

In line with the preceding discussion, a number of studies have distinguished between various elements of social support. The findings point to differential associations between various dimensions of social support and measures of subjective well-being. Studies that have distinguished between quantitative and qualitative elements of social support have indicated the relative importance of qualitative aspects of support to well-being in contrast to the minimal role of quantitative elements (Ward, Sherman & LaGory, 1984). Such studies have typically reported findings of positive associations between qualitative support indices (denoting satisfaction with support, perceived support, positive social ties) and various measures of well-being (Baldassare, Rosenfield & Rook, 1984; Bienenfeld, Koenig, Larson & Sherrill, 1997; Fiore, Coppel, Becker & Cox, 1986; Gibson, 1986-87; Liang, Dvorkin, Kahana & Mazian, 1980; Meddin & Vaux, 1988; Thompson & Heller, 1990; Venkatraman, 1995; Walls & Zarit, 1991).

In view of the evidence favoring the independence of positive and negative affect, researchers began investigating the possibility of positive and negative dimensions of social support and their potential independent associations with

well-being. Studies that have distinguished between the two dimensions of social support have generally reported differential associations between the two dimensions of support and indices of well-being. The bulk of the data suggests positive relationships between favorable or positive social ties and positive affect or global indices of psychological well-being. The research also indicates that perceived positive social resources had no effects on depression or reducing negative affect in general. In contrast, social relationships perceived to be negative or stressful were associated with various indices of psychological distress and had no effect on positive affect (Finch, Okun, Barrera, Zautra & Reich, 1989; Pagel, Erdly & Becker, 1987; Zautra, 1983). The results from these studies further emphasize the importance of assessing different dimensions of social support in order to clarify and explain the link between social support and well-being in the elderly.

Consistent with the need to distinguish between the various dimensions of social support, the Social Support Questionnaire (SSQ; Sarason et al., 1983) distinguishes between the components of availability of and satisfaction with one's social support. Based on the evidence pointing to the importance of the qualitative aspects of social support to subjective well-being, only the component measuring satisfaction with one's support was used in the present study. It was hypothesized that satisfaction with one's available support would be a significant positive predictor of overall happiness as measured on the MUNSH.

### Activity

There is a longstanding belief that activity and subjective well-being are linked (Stones & Kozma, 1989). A major proponent of this theoretical position, activity theory highlights the importance of social participation in adjustment to aging (Lemon, Bengston & Peterson, 1972). According to this theory, successful



aging occurs for individuals who maintain their middle-age levels of activity or who substitute activities for roles they are forced to give up (Riddick & Daniel, 1984). The theory's central premise is that of a positive relationship between involvement in activity and life satisfaction in the elderly. This theory has received some empirical support (Adelmann, 1994; Burrus-Bammel and Bammel, 1985; DeCarlo, 1974; Lemon et al., 1972).

Continuity theory is a modified version of activity theory that attempts to explain the relationship between activity and successful aging (Atchley, 1989). According to this theory of adult development, older individuals attempt to maintain existing psychological and social patterns by applying previously used and familiar knowledge, skills and strategies (Atchley, 1993). As it applies to activities, continuity theory postulates the gradual development of a stable and identifiable orientation towards domains of activity during adulthood and attempts to continue and maintain these general patterns in later years. When older adults feel the need to engage in activities, they look first to domains in which they feel proficient and which they prefer. With aging at times being associated with various changes in physical health, individuals may have to adapt by choosing a specific activity that is new but within a domain that is usually not. Alternatively, individuals may have to modify how they engage in the same activities to meet potential age-related physical challenges. Continuity therefore does not necessarily imply the absence of change but rather the use of previously established preferences and proficiencies to adapt to potential change (Atchley, 1993; Riddick & Daniel, 1984). The few available longitudinal studies on this topic have provided results generally favoring continuity theory (Lawton, 1993; Long, 1987; Lounsberry & Hoopes, 1988).

A number of studies with varying types of samples and measures of activity have provided evidence for a positive relationship between activity levels

and measures of subjective well-being such as life satisfaction and positive affect (Beck & Page, 1988; Conner, Dorfman & Tompkins, 1985; DeCarlo, 1974; Hong & Duff, 1994; Kozma & Stones, 1983; Lawton, 1994; Madigan, Mise & Maynard, 1996; Markides & Martin, 1979; Riddick, 1985; Riddick & Daniel, 1984; Ziegler & Reid, 1983).

Some studies have included multidimensional measures of activity. This methodological approach commonly distinguishes between various types of activity according to the degree of social or interpersonal focus involved in the activity. A typical distinction as originally presented by Lemon and his colleagues (1972) involves categorizing activities as informal (such as socializing with friends or relatives), formal (membership in organizations or community clubs), or solitary (watching television, reading, gardening). On the basis of the degree of interpersonal interaction or potential for such interaction inherent in the activity, the activities in the three categories can be ranked from most to least potential for interpersonal interaction and intimacy, respectively. Accordingly, such variations can demonstrate differential relationships to subjective well-being. Lemon and his colleagues (1972) specified that the strongest relationship is expected to be between informal activities and subjective well-being, followed by formal activities with the second strongest association. No relationship is predicted for solitary activities and well-being. The results from their study provided ambiguous findings for activity theory. Informal activity with friends was positively correlated with life satisfaction but no such relationship was noted for formal activities. There was no evidence for a relationship between solitary activities and life satisfaction.

Most of the studies that have employed this activity typology have reported positive relationships between social activities of an informal nature such as socializing with friends or family, and various measures of subjective well-being in

elderly individuals (Beck & Page, 1988; Graney, 1975; Hoyt et al. 1980; Lemon et al., 1972; Mancini, 1980; Palmore & Kivett, 1977; Ragheb & Griffith, 1982; Steinkamp & Kelly, 1987). Other studies have reported a positive relationship between measures of subjective well-being and membership in various organizations (Cutler, 1976; Palmore & Luikart, 1972; Stones & Kozma 1986) while others reported no difference between formal and informal activities in their importance for determining well-being (Beck & Page, 1988). The results from these studies provide inconsistent support for activity theory.

A second distinction that can be found in the activity/well-being literature is between frequency of participation in activities and the satisfaction experienced from such involvement. Studies that have employed such a methodology typically report greater importance of leisure satisfaction for subjective well-being compared to extent of involvement (Lomranz, Bergman, Eyal & Shmotkin, 1988; Ragheb & Griffith, 1982; Russell, 1987). However, a study that investigated the relationship between involvement in activities and subjective well-being in retired men found that the amount of explained variance in subjective well-being was similar for a general measure of activity (summation of 10 activities) and a more specific categorization (Beck & Page, 1988).

Overall, the literature on activity and psychological well-being in the elderly indicates a positive relationship between involvement in and satisfaction from activity and subjective well-being. In spite of some inconsistencies, this pattern of results generally holds across varying samples and measures. On the basis of these findings, activity level was expected to be a significant and positive contributor to overall happiness. A distinction was made between social and intellectual activities. More specifically, involvement in activities of a social nature were expected to show a stronger contribution to well-being in contrast to intellectual activities. Although continuity theory cannot be directly evaluated in

this study, the stated hypothesis is consistent with this theoretical position. It was hypothesized that individuals who have remained socially active in their later years would show higher levels of well-being than those individuals with low scores on measures of social activities.

### Summary of Hypotheses

#### Correlates and predictors of alcohol consumption

The demographic variables of gender, age, education, self-rated health and marital status were used as predictors of lifetime levels of social drinking. The psychosocial variables of extraversion/introversion, neuroticism/emotional adjustment, locus of control, satisfaction with available social support and involvement in socially-oriented activities were also used in the same analyses.

The first group of hypotheses pertained to the predictors of alcohol use in a group of elderly social drinkers . The hypotheses in this area focussed on the previously found relations between alcohol consumption and various sociodemographic and psychosocial variables. Previous findings point to age-related declines in alcohol consumption. A negative relationship between age and total lifetime alcohol consumption was expected in this research.

Based on the previous finding of a positive relationship between education and alcohol consumption, years of education (used as an index of socioeconomic status) was expected to emerge as a significant positive predictor of lifetime alcohol consumption levels. As it pertains to the other sociodemographic variables, a last hypothesis predicted higher levels of alcohol consumption for males and non-married individuals.

Based on the literature on psychosocial correlates of alcohol consumption, the central personality traits of extraversion and neuroticism were expected to be

positive predictors of alcohol consumption. Individuals who believe they have less control over their reinforcements were expected to have higher levels of social drinking. Higher levels of alcohol consumption were also expected for those individuals who reported being more satisfied with their social support.

### Alcohol and neuropsychological functioning

The second group of hypotheses focussed on the alcohol-related effects on frontal and temporal cerebral functioning. Although Ryback's (1971) continuity theory applies mainly to alcoholics or heavy drinkers, this research addressed the question of whether the theory could be extended to the social drinking range. According to this theory, increasing levels of alcohol consumption would be associated with poorer cognitive performance at initial and follow-up stages of testing. The second major focus in this area related to the specificity hypothesis which states that alcohol-related cognitive decline would be specific to frontal lobe functions. Based on this theory, lifetime alcohol consumption was expected to emerge as a significant, negative predictor of frontal cerebral functioning at the initial and follow-up phases of testing after controlling for the effects of sociodemographic, intellectual and psychosocial factors. No significant alcohol effects were expected for the temporal cognitive measure.

Secondary hypotheses in this area pertained to sociodemographic, intellectual and psychosocial covariates of neuropsychological functioning. The literature suggests age-related declines in cognitive functions that would be stronger for functions reflective of fluid versus crystallized abilities. This led to the hypothesis of a negative relationship between age and cognitive performance that would be stronger on tests reflective of frontal functions in contrast to temporal cerebral functioning for this sample. Education levels as indices of socioeconomic status and self-reported health were expected to emerge as

significant, positive predictors of frontal and temporal cerebral functioning.

The literature on intelligence and cognitive functioning points to intelligence as an important variable that needs to be considered in studies on predictors of cognitive functioning. It was hypothesized that intelligence would be a significant positive predictor of frontal and temporal cerebral functioning.

The available literature on the relationship between psychosocial variables and cognitive functioning has indicated certain patterns of findings. Based on the available data, it was expected that the personality traits of extraversion and neuroticism would emerge as significant negative predictors of cognitive functions. In contrast, it was hypothesized that internal locus of control and involvement in intellectually oriented activities would emerge as significant positive predictors of cognitive functioning.

#### Alcohol and subjective well-being

The third major group of hypotheses related to the influence of alcohol consumption variables on self-reported subjective well-being. Based on the limited available literature, this study explored further the nature of the potential effects of alcohol consumption on overall subjective well-being.

Secondary hypotheses pertaining to sociodemographic and psychosocial covariates of subjective well-being were also examined in this study. Based on the available empirical research, no age-related effects or gender differences in subjective well-being were expected. Positive contributions to subjective well-being were expected for the variables of marital status and health. Specifically, being married and being in good health were expected to be associated positively with subjective well-being as measured on the MUNSH.

Among the psychosocial variables studied, extraversion, internal locus

of control, social support satisfaction and involvement in socially oriented activities were expected to significantly and positively contribute to total well-being as measured on the MUNSH. In contrast, neuroticism was expected to emerge as a significant negative predictor of global subjective well-being.

## Method

### Subjects

Subjects consisted of 148 community dwelling volunteers residing independently in their own homes. The sample constituted 61.1% of the original sample of 244 subjects who participated in a study on psychosocial and cognitive correlates of off-target speech in the elderly initiated in 1988-89 (Arbuckle & Gold, 1993). Potential subjects were recruited in response to articles describing the study which were published in community newspapers. Others were recruited from visits made to local church groups and community organizations for seniors during which the project was briefly described. The present sample comprised only those subjects who completed a questionnaire on lifetime alcohol consumption that was being developed during the testing of these volunteers (Chaikelson, Arbuckle, Lapidus & Gold, 1994).

With the exclusion of 24 potential subjects with missing data or lack of interpretable data on the lifetime drinking questionnaire, the final sample consisted of 124 subjects, 87 females and 37 males between the ages of 61 and 90 years. The subjects were tested twice, with an average of 13 months separating the initial (Time 1) and follow-up (Time 2) phases of the study. The proportionally higher number of females in contrast to males in this sample is typical of and consistent with studies of the elderly. The mean age of the sample was 72.9 years ( $SD = 6.2$ ). Approximately one half of the sample was either married or cohabiting, with the rest falling in the not married category. This latter category included individuals who were single (never married), divorced, separated or widowed (see Table 1). The sample was exclusively white, consisting of Anglophone and Francophone individuals who scored in the



Table 1

Demographic Characteristics on Gender and Marital Status of Present Sample (N=124)

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Marital Status	Gender	
	Male (N=37)	Female (N=87)
Married <sup>a</sup>	28 (75.7%)	32 (36.8%)
Not Married <sup>b</sup>	9 (24.3%)	54 (62.1%)

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Note. a: category includes cohabiting and being remarried

b: category includes being single, divorced, separated, and widowed.

nonalcoholic range on the Michigan Alcoholism Screening Test (1971). According to Blishen's Index of Socioeconomic Status (Blishen & McRoberts, 1976), the subjects were predominantly of middle class backgrounds with a mean socioeconomic index of 49.9329 (SD = 20.4209). The nature of occupations reported for the present sample ranged from administrative/executive positions to professions in the health and education fields to occupations in the textile processing industries. The mean educational level attained for the total sample was 13.7 years (SD = 3.5). Means and standard deviations for all variables for the present sample are provided in Table 2. Table 3 includes descriptive statistics for the 24 subjects not included in the final sample.

Potential differences that may exist between the 124 subjects in the present sample and the remaining 96 subjects from the original sample were examined by means of Multivariate Analysis of Variance (MANOVA) on data from all variables that were available in the original round of testing. The alcohol variables from the Concordia Lifetime Drinking Questionnaire as well as results from repeated testing on various neuropsychological measures were not included in this analysis since data pertinent to these variables were only collected during the follow-up phase of the original study. Hotelling's T<sup>2</sup> analysis indicated significant differences between the two samples on a number of variables ( $F(13,206) = 2.16, p < .01$ ). The results indicated that the 124 subjects comprising the final sample were more extraverted and had a more internal locus of control than the 96 subjects remaining from the original sample. Based on their self reports from the initial Work and Family Interview, they also consumed more drinks on a weekly basis.

Two Chi-Square analyses were also calculated to compare differences in gender and marital status between the final sample of 124 subjects and the 24

Table 2

Descriptive Statistics for Demographic, Psychosocial, Cognitive and Alcohol Variables for Present Sample (N=124)

Variables	Mean	Standard Deviation
Age	72.9	6.2
Education	13.6	3.6
Blishen Socioeconomic Status	49.9	20.4
Health Status	2087.9	1332.9
EPI-Extraversion	10.6	3.1
EPI-Neuroticism	7.7	4.1
Locus of Control	55.1	9.5
Support Satisfaction	5.4	0.6
Social Activities	278.2	33.9
Intellectual Activities	246.0	27.1
MUNSH-Total Well Being	28.3	3.7
Weekly Lifetime Consumption Time 1	3.4	4.2
Current Consumption Time 2	6.0	10.4
Vocabulary	29.5	1.6
Frontal Factor Time 1	-.02	1.0
Frontal Factor Time 2	-.04	1.0
Digit Span Time 1	11.6	2.3
Digit Span Time 2	12.0	2.4

Note. Health status: Higher Scores = Poorer Health. Locus of control: Higher Scores = More Internal Orientation. Frontal factors: Higher Scores = Poorer Performance. All other variables are scored in the positive direction.

Table 3

Descriptive Statistics for Demographic, Psychosocial, Cognitive and Alcohol Variables for Excluded Subjects (N=24)

Variables	Mean	Standard Deviation
Age	73.6	6.1
Education	11.8	4.9
Blishen socioeconomic Status	47.3	20.7
Health Status	2254.5	1758.3
EPI-Extraversion	9.8	2.9
EPI-Neuroticism	7.9	4.0
Belief	52.9	9.1
Support Satisfaction	5.1	1.1
Social Activities	268.6	29.9
Intellectual Activities	237.6	33.7
MUNSH - Total Well-being	27.6	3.8
Vocabulary	25.7	4.0
Frontal Factor Time 1	.00	1.0
Frontal Factor Time 2	.02	0.8
Digit Span Time 1	11.6	2.9
Digitspan Time 2	10.9	2.7

Note. Health Status: Higher scores = poorer health. Locus of Control: Higher scores = more internal locus of control. Frontal Factors: Higher scores = poorer performance. All other variables are scored in the positive direction.

subjects that were excluded from the final sample. The results indicated a significant difference for both gender and marital status in the two samples. For the final sample of 124 subjects, the results indicated that 75.7% of the 37 males in the sample were married in contrast to 36.8% of the 87 females ( $\chi^2 = 13.6$ ,  $p < .0001$ ). For the 24 subjects not included in the final sample, the results indicated that 54% of the males were married in contrast to 24% of the females ( $\chi^2 = 11.3$ ,  $p < .001$ ).

### Measures

The test battery comprised a total of 17 measures. Three alcohol measures were used. One self-report measure was used to obtain information on the subjects' lifetime and current patterns of alcohol consumption. Another self-report questionnaire was used to screen for the presence of alcoholism. One test was used to measure crystallized intelligence. Neuropsychological functioning was evaluated with five tests. Six self-report questionnaires focussed on various aspects of psychosocial functioning and health. The measures used in the study were originally developed in English. For use with the Francophone subjects, they were translated into French and back-translated to ensure the adequacy of translation.

In addition to the above questionnaires, a Work and Family Interview was completed at initial testing. Questions in this structured interview focussed on demographics, education, work history as well as information on family functioning. One question on the number of drinks consumed on a weekly basis was also included. An Update Interview to the first Work and Family Interview administered in Round 1 was completed at Time 2 or follow-up. The interview had a structured format and was included to gather data on any changes that may have occurred in various areas of the subject's life (work, marital status,

family functioning, health, stress) since the last interview. Changes in health status were scored as 0 for poorer health, 1 for no change in health status and an improvement in health status obtained a score of 2. The sociodemographic variables chosen for inclusion in this research comprised age, gender, marital status, health status and years of education. This last variable was used as an index of socioeconomic status.

### Alcohol Measures

The Concordia Lifetime Drinking Questionnaire (CLDQ) (Chaikelson, Arbuckle, Lapidus & Gold, 1994) was used as a self-report, retrospective measure of current and lifetime alcohol use in an elderly population. It permits the calculation of weekly and maximum alcohol consumption levels at any given year of adulthood, as well as mean drinking over the past month before testing, and mean and maximum quantity of alcohol consumed per drinking occasion over the past month prior to testing. The unit of measurement is the drink defined as 13.6 grams of absolute alcohol. This is the approximate content of alcohol in 12 ounces of beer, 5 ounces of table wine and 1.5 ounces of hard liquor. The CLDQ has a structured interview format that consists of 3 sections focussing on current consumption, the circumstances surrounding the first drink and the start of regular drinking (defined as at least one drink per month) along with lifetime alcohol consumption. In the last section, the subject is asked to collaborate with the interviewer to complete a graph that represents their lifetime drinking pattern. To increase accuracy of recall of drinking behavior, salient events from the subjects' lives (e.g., getting married, enlisting in the army) are used to cue recall of patterns and changes in their drinking levels. The use of such a technique enables the examination of lifetime alcohol use from a longitudinal perspective while reducing possible effects of response and memory bias. Earlier studies have indicated that respondents reported significantly more

drinking on the graph than during the interview (Chaikelson et al., 1987-88). This supports the assumption that the use of this technique helps to increase the accuracy of reporting retrospective data. Scores for average total lifetime drinking per week were calculated for each subject. Higher scores indicate higher levels of alcohol consumption. The average total lifetime drinking score was derived from the total number of drinks consumed per week over the individual's lifespan divided by the the individual's current age minus 18. These scores were calculated for Time 1 and Time 2. The last point on the CLDQ graph provided a score for the level of lifetime drinking (number of drinks consumed per week) at the time that the subject completed the CLDQ, Time 2. A score for lifetime drinking at Time 1 was calculated retrospectively from the point on the graph that corresponded to the time of initial testing during which the subject had previously completed the psychosocial measures and the neuropsychological tests for the first time. The last point on the graph also provided a measure of the number of drinks consumed per week in the last month prior to testing. This provided the measure of current drinking. Within the light drinking range of this sample, a number of subjects reported being occasional drinkers, meaning that they consumed alcoholic beverages only at special occasions during the course of a year. These subjects had lifetime alcohol scores slightly above zero and since they were not true abstainers, it was decided that rounding off their scores .01 drinks per week would provide a more accurate reflection of their patterns of alcohol use. A total of three alcohol scores were obtained for each subject, two reflecting lifetime drinking at Times 1 and 2 and the other reflecting current drinking at Time 2.

Initial validation data point to good psychometric properties for the CLDQ as a measure of lifetime alcohol consumption. It has shown good temporal stability with test-retest reliability coefficients ranging from .68 to .78 over a mean

interval of 33 months. Concurrent validity was also high with correlations between self-reports and reports by spouses for current drinking at .87 and .85.

The Michigan Alcoholism Screening Test (MAST) (Selzer, 1971) is a self-report questionnaire that was used to screen for the presence of alcoholism. Its scores serve as a measure of the extent to which an individual is presently experiencing or has experienced symptoms resulting from alcohol dependency. The MAST consists of 24 items with a Yes/No response format. The items are weighted such that the most discriminatory questions for the presence of alcoholism are given greater weights. A score of three points or less is considered nonalcoholic, a score of four points is suggestive of alcoholism and a score of five points or more denotes alcoholism. The MAST has been shown to discriminate between nonalcoholic controls and hospitalized alcoholics (Selzer, 1971). Subjects in the present sample fell within the nonalcoholic range with a mean score of .45 (SD = .85).

### Cognitive Measures

The Vocabulary Subtest from the Revised Examination "M" (M-Test) comprised the measure of crystallized intelligence. The M-Test is a measure of intelligence and aptitude that was developed for the Canadian Army during World War II. The M-Test is a timed test comprising 8 subtests, three measures of nonverbal intelligence, three measures of verbal intelligence and two measures of mechanical aptitude. Wartime studies of reliability and validity reported test-retest reliabilities around .95 and validity coefficients ranging from .72 to .80 against other measures of intelligence (Schwartzman et al., 1987). Test-retest reliability of the M-test, over a 40 year period was .78 (Schwartzman et al., 1987). A decline was reported for nonverbal intelligence while verbal intelligence remained relatively stable.

The Wisconsin Card Sorting Test (Milner, 1963) provided an objective and



quantitative measure of concept formation and flexibility. The subject is presented with 4 stimulus cards differing on the dimensions of color, form and number. They are then provided with a pack of 128 response cards varying along the three dimensions. The subject is instructed to place each response card underneath one of the stimulus cards. No other cues are given with the exception of the experimenter informing them as to the correctness of their response. Milner's (1963) version used in this study differs from Berg's (1948) original version in that the sorting principle is shifted to the next category once the subject has achieved 10 consecutive correct responses in the category being used instead of 5. Another difference entails continuing the procedure until the subject has successfully completed 6 sorting categories. The shift to the next category occurs without warning and previously correct responses are now considered wrong. Subjects who persevere show difficulty in 'shifting' to the next category despite feedback from the experimenter. Difficulties in sorting by category suggest an impaired ability to form concepts. Both indices have been shown to be especially sensitive to dorsolateral frontal lobe lesions (Milner, 1963). Poorer performance reflected by fewer sorting categories and more perseverative errors was evident in patients with such lesions in contrast to patients with lesions in other brain areas or normal controls (Milner, 1963; Robinson, Heaton, Lehman & Stilson, 1980). The total number of errors as well as total number of perseverative and non-perseverative errors provided scores for each subject. Higher number of errors indicate poorer performance.

The Trail Making Test, from the Halstead-Reitan Neuropsychological Test Battery (Halstead, 1947; Reitan & Davison, 1974) is a test of visual conceptual and visuomotor tracking. It is reported as one of the most sensitive tests to the presence of brain damage when discriminating between brain injured patients and normal control subjects (Lezak, 1983). The test is composed of two parts.

In Part A, the subject is asked to link randomly arranged numbers from 1-25 without lifting their pencil. Part B increases in difficulty and measures the speed of connecting randomly presented letters (A -L) and numbers (1 - 13) in a pre-ordered alphanumeric alternating sequence (A to 1 to B to 2,...). Successful completion of this task requires the subjects to inhibit the preceding sequential associations within each set (set flexibility). This test of set flexibility is a good measure of frontal lobe functioning. The total number of seconds required to complete each part provides two scores for each subject. In addition, the difference in time taken to complete Trails B in comparison to Trails A (Trails B - A) provides a measure of inhibition of previously well-established responses with a greater difference score indicating more inhibition. This difference score suggests difficulties in complex, conceptual tracking and difficulties in inhibiting an ongoing response (such as that learned on Trail A), functions primarily represented in the frontal cerebral area (Lezak, 1983).

The Controlled Oral Word Association Test - Form A (Benton & Hamsher, 1976) was used as a measure of verbal fluency. In this task, subjects are required to make verbal associations to three different letters of the alphabet by saying all the words they can think of beginning with a given letter as quickly as they can. Subjects have one minute to provide as many words as they can for each letter. The letters increase in associative difficulty and are presented successively as stimuli. For the form used in this study, the three letters consisted of C, F, L with the letter S being used in a practice trial. Initial clinical evidence indicate the ability of the Word Fluency test to differentiate between hospitalized normal control patients and patients with cerebral damage regardless of laterality of lesion (Borkowski, Benton & Spreen, 1967). Further evidence has indicated that lesions in the left frontal lobe area are associated with the poorest level of fluency on this test (Miceli, Caltagirone, Gainotti,

Masullo, & Silveri, 1981; Perret, 1974). Total number of acceptable responses, unacceptable responses and repetitions were computed across the three letters for each subject. Verbal fluency is measured as the total number of unique and acceptable words that are generated across the three trials with higher scores reflecting higher levels of verbal fluency.

A fourth neuropsychological measure consisting of an immediate free recall test was used as an index of proactive inhibition (Moscovitch & Winocur, 1983). Proactive inhibition or interference (PI) is the inability to clear working memory from previously stored information upon presentation of new material. The failure to show release from PI is commonly found in patients with unilateral left frontal lesions as well as Korsakoff patients (Arbuckle & Gold, 1993). On the basis of such findings, it was used as an index of frontal cerebral functioning in this research. The test involved immediate free recall of 7-word lists with words drawn from the same taxonomic category over four trials. This was followed by one trial (shift trial) of free recall of a word list from a different taxonomic category. Release from PI was calculated as the difference between the number of words recalled on the shift trial and the number of words recalled on the immediately preceding training trial (Arbuckle & Gold, 1993).

The four preceding tests measure functions that are principally located in the frontal lobes. Due to the small subject sample and the concern for maintaining an acceptable subject to variable ratio, the scores on the four measures were subjected to a factor analysis in order to try to reduce the number of variables that essentially reflect frontal cerebral functioning. The variables of total number of perseverative errors on the WCST, Trails D (completion time Trails B - Trails A), total number of acceptable responses on the Controlled Oral Word Association Test, and PI score on trial 4 were found to load on one factor that was labelled Frontal1. These variables accounted for 45.7% of the variance

in the resulting factor. The measures comprising the Frontal1 factor were all used during the initial stage (Time 1) of the research. Measures obtained at Time 2 of Trail D and total number of acceptable responses on Benton's word association test also loaded on a factor labelled Frontal 2. They accounted for 62.3% of the variance in the factor. Higher scores on both frontal factors indicated poorer frontal cerebral functioning.

The Digit Span Subtest from the Wechsler Memory Scale (Wechsler, 1945) provides an index of immediate verbal recall and is reflective of temporal cerebral functioning (Shaw & Spence, 1985). Immediate verbal recall is a relatively stable capacity that is resistant to the effects of many dementing diseases, but does decline somewhat with age beginning in the late sixties with sharp declines after the seventies (Lezak, 1983). Performance on this test was measured both in the initial and follow-up phases of the longitudinal study. In this study, digit span was used as a measure to contrast scores obtained for the frontal factor. Both forward and backward digit span were evaluated. For digits forward, the subject is presented aurally with strings of numbers of successively increasing length and is asked to repeat them exactly as heard. Two trials are allowed for each span length. The procedure continues upward until both sets of a series are successively failed. For digits backwards, the subject is asked to repeat the strings of numbers in the reverse order from presentation. Both digits forward and backward tend to be more vulnerable to left hemisphere involvement than to either right or diffuse damage (Lezak, 1983). Total scores for number of digits correctly recalled were obtained for digits forward, backward and then combined into one score. One score was calculated for performance at initial and follow-up testing. Higher scores were reflective of better temporal functioning.

## Psychosocial Measures

The Memorial University of Newfoundland Scale of Happiness (MUNSH) (Kozma & Stones, 1980) was used as a measure of psychological well-being. This self-report questionnaire consists of 24 items with a yes or no response format. There is a balanced representation of items dealing with positive and negative affect. The questionnaire also distinguishes between recent positive or negative affect experienced during the past year and more general life experiences. The final score for overall happiness consists of subtracting the sum of the negative items from the sum of the positive items. For this study, the score for overall happiness was used as an index of subjective well-being. Higher scores indicate higher levels of overall happiness.

Validation and cross-validation studies have provided positive evidence for the psychometric soundness of the MUNSH. Internal consistency is reported between .85 and .86. Test-retest reliability is reported at .70 with intervals ranging from 6 months to one year. Validity coefficients between .63 and .84 have been reported. The MUNSH has also been shown to be relatively free from the effects of social desirability (Kozma & Stones, 1980; 1983; 1987) as well as age (Kozma, Stones & Kazarian, 1985).

The Eysenck Personality Inventory (EPI) (Eysenck & Eysenck, 1968) is a standardized, objective personality questionnaire consisting of 57 items that require yes or no responses. The EPI measures the personality dimensions of Extraversion/Introversion and Neuroticism/Emotional Adjustment. The variable of Extraversion can be defined as a composite of assertiveness and sociability while Introversion is best described as introspection. Neuroticism focusses on the individual's emotional adjustment or maladjustment particularly anxiety, emotional instability and somatic concerns. The EPI also includes a number of items that assess the individual's tendency toward a socially desirable response bias.

These items comprise the Lie scale but this was not included as a factor for further analyses. Psychometric properties of the EPI include test-retest reliabilities ranging from .74 to .94 and reported construct validity coefficients between .79 and .92. Higher scores indicate higher levels of the personality characteristic.

The Desire and Expectancy Locus of Control Scale is a 22-item, locus of control scale that was developed specifically for use with an elderly population (Reid & Ziegler, 1980). The questionnaire comprises two sections and includes items relevant to the variables of desire and expectancy of reinforcers in the elderly. The Desire subscale assesses the extent to which an individual desires reinforcers with the reinforcers selected from a representative survey of desired goals. Items relevant to the Expectancy/Belief subscale reflect the degree to which an individual perceives obtaining such reinforcers as being under their control. Items are answered according to a 5-point Likert rating scale with high scores indicating an internal locus of control. Initial validity studies indicate good inter-item reliability ranging from .84 to .89, temporal stability over a 12-month period ranging between .54 and .63 . The measure appears to be unaffected by the influence of social desirability and appears to correlate with current and longitudinal self-report measures of psychological adjustment such as life satisfaction and self-concept (Reid & Ziegler, 1980; 1981). Only the Expectancy/Belief scale was used as a factor in further analyses.

In its original form, the Social Support Questionnaire (SSQ) (Sarason, Levine, Basham & Sarason, 1983) is a 27-item questionnaire that provides a measure of the availability and satisfaction components of social support. Each item consists of two parts, asking respondents to list the people that they can turn to in times of need and to rate their degree of satisfaction with these social supports. Availability of support is scored as the number of individuals (0 - 9)

listed per item. Satisfaction with one's available support in a given circumstance is rated on a 6-point scale ranging from very satisfied (6) to very dissatisfied (1). Mean availability scores for number of relatives and number of friends and mean satisfaction scores are then derived for each subject by dividing the total availability and satisfaction scores for all items by the total number of items.

Initial validation studies done with the SSQ indicate good psychometric properties. Availability and satisfaction scores have shown good internal consistency (Cronbach's alpha coefficients = .97 and .94 , respectively). Good temporal stability over a 4-week period has also been reported with test-retest correlations of .90 and .83 for availability and satisfaction scores, respectively (Sarason et al., 1983).

For this study, a shortened 16-item version was used. It consisted of 8 items each for availability of and satisfaction with available support. Only scores for the satisfaction component were included in statistical analyses for this research. Higher scores are indicative of being more satisfied with one's available supports. For this shortened version, temporal stability over a 6-month period was reported to be .72 for support satisfaction. Satisfaction with available support was also found to contribute to mental health in a sample of elderly caregivers (Gold, Cohen, Shulman, Zuccherro, Andres & Etezadi, 1995).

The Activities Checklist (Arbuckle, Gold & Andres, 1986; Arbuckle, Gold, Chaikelson & Lapidus, 1994) is a checklist of 22 occupational, social, family and recreational activities that are relevant to an older population. Activities are weighted for the extent of social or intellectual effort involved. Subjects are asked to indicate the frequency of involvement in each activity on a 5-point rating scale ranging from less than once a year (1) to daily (5) with a rating of 3 for 1 to 3 times a month. The sums of the weighted frequencies were calculated separately for intellectually and socially oriented activities. These were used as

measures of levels of intellectual and social activities. For purposes of interpretation, higher scores indicate more involvement in the specified activities. Psychometric data for the activities checklist indicate moderate temporal stability ranging from .43 to .54 as well as moderate internal consistency with values ranging from .14 to .71 (Arbuckle et. al., 1994).

The Seriousness of Illness Rating Scale (SIRS) was used as an index of self-reported illness (Wyler, Masuda & Holmes, 1968). The original checklist consists of 126 commonly recognized physical and mental symptoms and diseases. Each item is assigned a weight based on magnitude of severity that was obtained by separate ratings by medical and non-medical samples. The scale's reproducibility and reliability was evidenced by the high and significant correlation obtained in a second study using two medical samples (Wyler, Masuda & Holmes, 1970).

For the present study, only symptoms and diseases of obvious relevance to an elderly sample were included. A total of 62 items comprised the final checklist. Subjects were asked to indicate those symptoms/diseases that they experienced during the past 5 years. Higher scores were reflective of poorer physical health. A test-retest reliability of .72 was reported for weighted illness scores over a 5-year interval.

### Procedure

Subjects who agreed to participate were contacted by telephone to arrange individual meetings with one of several interviewers at the subject's convenience for place and time. Subjects were usually tested in their own homes or at Concordia University. All subjects who agreed to participate signed a consent form prior to testing and were free to withdraw from the study at any time. Testing at Time 1 and Time 2 took place over 2 sessions with an average interval of 13 months between the sessions. At Time 1, the Work and Family Interview, psychosocial measures and neuropsychological tests were completed. Due to the length of the test battery



to be administered at Time 1 and to prevent subject fatigue, the interview and psychosocial measures were completed during one session and the neuropsychological tests were completed in a second session a few days later. The Update Interview and alcohol measures were then completed during the follow-up phase of the study, at Time 2. A number of neuropsychological tests were also repeated at Time 2. These included the Digit Span Subtest, Benton's Word Fluency Test and Trail Making Test. Subjects were tested in their preferred language, English or French. As a control procedure for the neuropsychological measures, participants were encouraged not to take any nonprescription drugs for the 24 hours preceding each session.

## Results

Correlational statistical methods were used for preliminary data analyses in this study. The primary analyses comprised multiple regression analyses that examined the various correlates and predictors of alcohol consumption, and the influence of alcohol consumption on neuropsychological and psychological functioning. Lifespan curves provided additional descriptive data on lifetime alcohol consumption levels. This provided the opportunity for further examination of the relationship between lifetime alcohol use and the demographic factors of age and education.

### Preliminary Evaluation of Data

Preliminary evaluation of the data was completed according to Tabachnick and Fidell's (1983) recommended guidelines. The raw data were first checked for the presence of univariate outliers. Evaluation of normality of variables was accomplished by inspecting the frequency distribution of scores for each variable, and the significance of the values for skewness if different from zero. Results indicated mild positive skewness for health status and neuroticism while the three alcohol variables showed moderate skewness. The distributions for the variables of social support satisfaction, total MUNSH and vocabulary showed moderate negative skewness. Scores from variables with mild positive skewness were transformed using the square root of the total scores for each variable, while those variables that were moderately skewed were transformed using the log 10 of the total scores for each variable. Scores from variables with negative skewness were subjected to a reflex log 10 transformation. As a result, the interpretation for these variables is such that higher scores now reflect lower levels of support satisfaction, general well-being and intelligence. All variables

approximated a normal distribution following the transformations. Inspection of the scatterplots of the residuals further indicated that the assumptions of normality, linearity and homoscedasticity were adequately met.

Following transformation of the skewed variables, the data were inspected for the presence of multivariate outliers. The results of the Mahalanobis distance measure indicated the presence of one multivariate outlier on a number of variables. Through subject identification numbers, it was indicated that the same subject consistently recurred as an outlier across variables. This male subject was dropped from the sample, decreasing the total number of subjects in the new sample to 123. In comparison to the rest of the sample, this subject had less education, worse health, higher scores on neuroticism and had a more external locus of control. No other multivariate outliers were identified following repeated analyses. The final sample comprised 36 males and 87 females.

A comparison of the sample size and total number of variables used in the regression analyses provided a subject-variable ratio of 6 to 1. This was deemed an acceptable minimum case-to-variable ratio according to Tabachnick and Fidell's (1983) guidelines. However, not all variables were ever used simultaneously in any one analysis with the maximum used in any analysis being 11. This led to a subject-variable ratio of 11 to 1. Mean substitution was used to handle missing data in the regression analyses.

### Descriptive Statistics

According to the means obtained for the variables in this study (see Table 2), the sample was characterized by good physical health. The subjects tended to be more extroverted than introverted, well-adjusted, involved in various activities and happy according to the MUNSH. They tended to have an internal locus of control and seemed satisfied with their available social supports. They

generally obtained high scores on the Vocabulary Subtest.

In relation to their pattern of alcohol use, the sample generally reported levels of use at the lower end of the spectrum. Based on the lifetime measure of alcohol use at Time 1 obtained from the CLDQ, the mean number of drinks consumed per week over the lifetime was 3.4 drinks. Additional information on the sample's pattern of alcohol use was obtained with the use of categories for the mean number of drinks consumed per week over the individual's lifetime. Based on the same categories used in the NADS (Eliany et al., 1992) with the exception of one (.01 - .99 drinks per week), these categories ranged from 0 drinks per week to 14 or more drinks per week. When the levels of lifetime drinking at Time 1 are applied to these categories, 12.9% of the sample was classified as abstainers while 30.6% of the sample reported consuming between .01 and .99 drinks per week. The greatest number of subjects (44.4%) reported consuming between 1 and 7 drinks per week while only 7.3% consumed between 8-13 drinks per week and 4.8% consumed an average of 14 or more drinks per week over their lifetime.

With the exception of the category for .01-.99 drinks per week, the same categories were then applied to the single item alcohol data obtained from the Work and Family Interview. This question asked respondents to provide an average of how many drinks they habitually consumed in one week. The results revealed a threefold increase in the reported number of abstainers (38.2%) with this measure. As with the CLDQ lifetime alcohol measure, an equivalent number of subjects (44.7%) reported consuming between 1 and 7 drinks per week when asked in the interview. Whereas fewer individuals reported consuming 14 or more drinks per week in contrast to 8-13 drinks per week for the CLDQ lifetime alcohol measure, the opposite pattern was noted for the alcohol data obtained from the interview. Only 4.9% of the respondents reported consuming between 8

and 13 drinks per week in contrast to 12.2% of the sample that reported consuming 14 or more drinks per week.

In Table 4, intercorrelations among the untransformed variables used in the study are presented for the whole sample. The results from correlational analyses indicated that a number of variables significantly correlated with the alcohol consumption variables. The variables of gender, education, locus of control, vocabulary, temporal functioning at Time 1 and frontal functioning at Time 2 correlated significantly with lifetime alcohol consumption at Times 1 and 2. The magnitude of the correlations indicated the strongest relationships were with the demographic variables of gender (Time 1,  $r = -.36$ ,  $p < .0001$ ; Time 2,  $r = -.37$ ,  $p < .0001$ ) and education (Time 1,  $r = .31$ ,  $p < .001$ ; Time 2,  $r = .32$ ,  $p < .0001$ ). The remaining significant correlations had values ranging between .19 and .21. The pattern of findings indicated that subjects who were males, with higher levels of education, an internal locus of control, higher intelligence and higher scores on neuropsychological tests showed significantly higher levels of lifetime alcohol consumption. Current drinking at Time 2 was significantly associated with being male, higher levels of education, an internal locus of control, more self-reported happiness on the MUNSH, better performance on follow-up tests of frontal functioning and higher levels of lifetime alcohol consumption. Consistent with the findings for the lifetime alcohol consumption variables, the strongest correlations for current drinking at Time 2 were obtained with the demographic variables of gender ( $r = -.41$ ,  $p < .0001$ ) and education ( $r = .27$ ,  $p < .005$ ).

The patterns of correlations for the neuropsychological measure of frontal cortical functioning at initial testing and follow-up revealed that being younger, more educated, in good health and more active, separately predicted better performance. Higher levels of intelligence as reflected by higher vocabulary scores was also significantly associated with better performance. In addition,

**Table 4. Intercorrelations For All Variables (N=124)**

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Age																				
2. Sex	.00																			
3. Education	-.21 <sup>a</sup>	-.32 <sup>a</sup>																		
4. Marital Status	.20 <sup>a</sup>	.35 <sup>a</sup>	-.23 <sup>b</sup>																	
5. Health Status	.37 <sup>a</sup>	.06	-.08	-.01																
6. Extraversion	-.03	-.07	-.11	-.03	.01															
7. Neuroticism	.09	.32 <sup>a</sup>	-.15	.09	.08	.03														
8. Locus of Control	-.22 <sup>a</sup>	-.05	.09	-.01	-.18 <sup>a</sup>	-.01	-.06													
9. Support Satisfaction	-.03	-.12	.24 <sup>a</sup>	-.19 <sup>a</sup>	-.10	-.09	-.35 <sup>a</sup>	.25 <sup>b</sup>												
10. Social Activities	-.34 <sup>a</sup>	-.10	.10	-.19 <sup>a</sup>	-.21 <sup>a</sup>	.03	-.14	.16	.08											
11. Intellectual Activities	-.34 <sup>a</sup>	.02	.16	-.07	-.18 <sup>a</sup>	.07	-.09	.19 <sup>a</sup>	.09	.88 <sup>a</sup>										
12. MUNSH	-.28 <sup>b</sup>	-.26 <sup>c</sup>	.15	-.15	-.32 <sup>a</sup>	-.10	-.46 <sup>a</sup>	.36 <sup>a</sup>	.35 <sup>a</sup>	.38 <sup>a</sup>	.29 <sup>a</sup>									
13. Vocabulary	-.25 <sup>b</sup>	-.26 <sup>c</sup>	.35 <sup>a</sup>	-.22 <sup>a</sup>	-.15	-.24 <sup>b</sup>	-.09	.17	.06	.04	.06	.22 <sup>a</sup>								
14. Frontal Factor Time 1	.54 <sup>a</sup>	.05	-.23 <sup>b</sup>	.20 <sup>a</sup>	.26 <sup>c</sup>	.07	.02	-.05	.13	-.22 <sup>a</sup>	-.22 <sup>a</sup>	-.18 <sup>a</sup>	-.40 <sup>a</sup>							
15. Digit Span Time 1	-.25 <sup>a</sup>	-.19 <sup>a</sup>	.27 <sup>c</sup>	-.16	-.13	-.03	.00	.09	-.14	.10	.06	.01	.24 <sup>b</sup>	.43 <sup>a</sup>						
16. Frontal Factor Time 2	.41 <sup>a</sup>	.10	-.27 <sup>c</sup>	.09	.34 <sup>a</sup>	.07	.09	-.14	.04	-.18 <sup>a</sup>	-.18 <sup>a</sup>	-.16	-.49 <sup>a</sup>	.66 <sup>a</sup>	-.39 <sup>a</sup>					
17. Digit SpanTime 2	-.46 <sup>a</sup>	-.10	.30 <sup>a</sup>	-.25 <sup>a</sup>	-.06	-.01	.03	.03	-.14	.15	.09	.03	.27 <sup>c</sup>	-.57 <sup>a</sup>	.59 <sup>a</sup>	-.48 <sup>a</sup>				
18. Lifetime Drinking Time 1	-.14	-.36 <sup>a</sup>	.31 <sup>a</sup>	-.09	-.07	.09	-.02	.19 <sup>a</sup>	.02	.03	-.02	.10	.21 <sup>a</sup>	-.10	.20 <sup>a</sup>	-.19 <sup>a</sup>	.16			
19. Lifetime Drinking Time 2	-.15	-.37 <sup>a</sup>	.32 <sup>a</sup>	-.08	-.08	.09	-.02	.21 <sup>a</sup>	.03	.04	-.01	.10	.21 <sup>a</sup>	-.10	.19 <sup>a</sup>	-.19 <sup>a</sup>	.16	.99 <sup>a</sup>		
20. Current Drinking Time 2	-.13	-.41 <sup>a</sup>	.27 <sup>c</sup>	-.04	-.10	.08	-.01	.20 <sup>a</sup>	.03	.08	.05	.18 <sup>a</sup>	.15	-.08	.17	-.23 <sup>b</sup>	.14	.61 <sup>a</sup>	.64 <sup>a</sup>	

Note. Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, Not Married = 2. Health Status: Higher Scores = Poorer Health. Frontal Factors 1 and 2: Higher scores = Poorer Performance. Locus of Control Higher Scores = More Internal Locus of Control. All other variables are scored in the positive direction. a =  $p < .05$ , b =  $p < .01$ , c =  $p < .005$ , d =  $p < .001$ , e =  $p < .0001$ .

individuals who were married and happier as measured on the MUNSH showed better performance at Time 1 only. Among the significant correlations, the strongest relationship was indicated for the demographic variables of age (Time 1,  $r = .54$ ,  $p < .0001$ ; Time 2,  $r = .41$ ,  $p < .0001$ ) and education (Time 1,  $r = -.23$ ,  $p < .01$ ; Time 2,  $r = -.27$ ,  $p < .005$ ).

For temporal cortical functioning at initial testing, being younger, male, being more highly educated and having higher vocabulary scores were associated with better performance. Higher levels of lifetime alcohol consumption were also positively associated with better performance. The same pattern of results was found for age, education, vocabulary and temporal functioning at follow-up. In addition, being married was also significantly correlated with better performance at follow-up. As with the previous variables, the strongest correlations were obtained for the variables of age and education.

A number of sociodemographic and psychosocial variables were significantly correlated with subjective well-being as measured by the MUNSH. Among the sociodemographic variables, older people, females and individuals who were in poorer health had lower levels of subjective well-being. Consistent with the literature on the psychosocial correlates of subjective well-being, significant correlations in the predicted directions were found between each of the psychosocial variables used in this study and well-being with the exception of extraversion. Individuals who had lower scores on the EPI-Neuroticism subscale, who had an internal locus of control, who were more satisfied with their social support and were more involved in various activities experienced greater subjective well-being. No significant correlations were noted between subjective well-being and the alcohol consumption variables. In contrast to the dependent variables of alcohol consumption and cognitive functioning, the strongest correlations for well-being were obtained with the psychosocial as opposed to the

demographic significant variables (see Table 4).

### Primary Analyses

#### Correlates of alcohol consumption

The present research investigated the sociodemographic and psychosocial correlates of lifetime alcohol consumption among elderly social drinkers. The issue of age-related declines in alcohol consumption was addressed by means of direct entry hierarchical multiple regressions. These regressions evaluated the effects of age on lifetime levels of drinking obtained at initial testing and at follow-up. The first multiple regression utilized the five demographic variables (age, sex, education, marital status, health status) and five psychosocial variables measured at Time 1 (extraversion, neuroticism, belief, involvement in social activities, social support satisfaction) to predict total lifetime drinking at Time 1 (see Table 5). The results from this analysis indicate that 26% of the variance in lifetime drinking at Time 1 was accounted for by these variables. The amount of adjusted variance was somewhat lower at 19.4%. First stage demographic variables explained 22.2% of the variance in total lifetime drinking at Time 1,  $F(5, 117) = 6.68, p < .001$ . Higher levels of total lifetime consumption were found for men ( $t = -3.47, p < .001$ ) and individuals with higher levels of education ( $t = 2.80, p < .01$ ). No significant effects were found for age. The addition of the psychosocial variables in the second stage increased the amount of variance explained to 26%. This increase was not significant although the overall regression equation remained significant,  $F(10, 112) = 3.93, p < .0001$ . Gender ( $t = -3.29, p < .001$ ) and education ( $t = 2.97, p < .005$ ) remained the only significant predictors of lifetime alcohol consumption, contributing approximately 7% and 5.9% of unique variance to lifetime drinking at Time 1, respectively.

The results from the regression on levels of lifetime drinking at Time 2 were



Table 5

Results of Final Stage of Regression Analysis Predicting Time 1 Lifetime  
Drinking (N=123)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	-.3244	-.38	.072 <sup>d</sup>
	Age	-.0602	-.15	.003
	Education	.2704	.36	.059 <sup>c</sup>
	Marital Status	.0199	-.15	<.001
	Health Status	.0012	-.09	<.001
Stage 2	Extraversion	.0741	.07	.005
	Neuroticism	.0727	-.07	.004
	Locus of Control	.1567	.19	.021
	Social Activities	.0307	.12	.001
	Support Satisfaction	.0881	-.03	.006

Note.  $R^2 = .26$ ;  $\bar{R}^2 = .22$  for Step 1;  $\Delta R^2 = .04$  for Step 2, (ns). Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, Not Married = 2. Health Status: Higher Scores = Poorer Health. Support Satisfaction: Higher Scores = Less Satisfaction. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .

consistent with those obtained for lifetime drinking at Time 1. The set of variables accounted for a total of 28% of variance and 21.5% of adjusted variance in lifetime alcohol consumption at Time 2. Demographic variables accounted for 23.7% of the variance explained in levels of lifetime drinking at Time 2,  $F(5, 117) = 7.27, p < .001$ . As in the previous analysis, higher consumption levels were found for men ( $t = -3.64, p < .001$ ) and individuals with higher education ( $t = 2.93, p < .005$ ). Addition of the psychosocial variables in the second stage increased the variance explained to 28%, a nonsignificant increase of 4.3%. The overall regression equation remained significant,  $F(10, 112) = 4.34, p < .001$ . No psychosocial variables emerged as significant predictors of lifetime drinking. Consistent with this finding is the small amount of unique variance accounted for by these variables that ranged between .1 and 2.4%. The demographic variables of gender ( $t = -3.46, p < .001$ ) and education ( $t = 3.12, p < .005$ ) retained their significant effects with gender contributing 7.7% of unique variance to lifetime drinking at Time 2 and education contributing 6.3% of unique variance (see Table 6).

#### Alcohol and neuropsychological functioning

A major emphasis of this study involved the examination of the continuity and specificity hypotheses and their relevance to the social drinking range. The continuity theory (Ryback, 1971) espouses a dose-response relationship between alcohol consumption levels at the higher end of the alcohol consumption spectrum and cognitive declines. The specificity hypothesis states that alcohol-related cognitive declines are specific to frontal cerebral functions. As a test of these hypotheses, direct entry hierarchical multiple regressions were computed with the Time1 lifetime alcohol variable as it predicts frontal and temporal neuropsychological functioning concurrently at Time 1 while controlling for the effects of sociodemographic, intelligence and psychosocial variables. Current

Table 6

Results of Final Stage of Regression Analysis Predicting Time 2 Lifetime Drinking (N=123)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	-.3358	-.39	.077 <sup>d</sup>
	Age	-.0648	-.16	.003
	Education	.2796	.37	.063 <sup>c</sup>
	Marital Status	.0399	-.14	.001
	Health Status	-.0040	-.10	<.001
Stage 2	Extraversion	.0838	.08	.007
	Neuroticism	.0757	-.07	.005
	Locus of Control	.1679	.20	.024
	Social Activities	.0360	.13	.001
	Support Satisfaction	.0819	-.04	.005

Note.  $R^2 = .28$ ;  $R^2 = .24$  for Step 1;  $\Delta R^2 = .04$  for Step 2, (ns). Gender: Male = 1, Female = 2.

Marital Status: Married/Cohabiting = 1, Not Married = 2. Health Status: Higher Scores = Poorer Health. Support Satisfaction: Higher Scores = Less Satisfaction. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .

drinking at Time 2 was then used in similar regression analyses to predict neuropsychological functioning at follow-up (Time 2). A last set of regression analyses examined the longterm predictive relationship between lifetime alcohol consumption at Time 1 and cognitive functioning at Time 2. The demographic variables of age, sex, education, marital status and health status were entered in the first stage. Vocabulary was entered in the second stage. Psychosocial variables of extraversion, neuroticism, belief, involvement in intellectual activities and satisfaction with one's available support followed in the third stage. In the first set of regressions, the last stage variable comprised the alcohol variable of total lifetime at Time 1 predicting neuropsychological functioning at Time 1. The same set of variables was used in regressions to predict longterm cognitive functioning at follow-up or Time 2. In addition, current alcohol use at Time 2 was used as a predictor of neuropsychological functioning at Time 2. Based on the continuity hypothesis, alcohol consumption was expected to emerge as a negative predictor of cognitive performance. According to the specificity hypothesis, these cognitive declines would be specific to frontal cerebral functions. For the regressions predicting neuropsychological functioning, eight subjects were excluded from the analyses. Four subjects reported physical limitations (poor vision, shaking) that would hinder their performance on such tests. The remaining 4 subjects were excluded because they were taking prescription medications (i.e., antidepressants, benzodiazepines) that would interfere with their performance.

For the regression of Time 1 lifetime alcohol consumption levels on Time 1 scores of frontal brain functioning (See Table 7), the total variance explained in frontal scores at Time 1 was 41.5%. The adjusted variance accounted for was somewhat lower at 35%. Stage 1 demographic variables explained 32.5% of the variance in scores of frontal cortical functioning,  $F(5, 109) = 10.50, p < .0001$ .

Table 7

Results of Final Stage of Regression Analysis with Lifetime Drinking at Time 1  
Predicting Time 1 Frontal Cortical Functioning (N=115)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	-.0036	.07	<.001
	Age	.4387	.55	.133 <sup>d</sup>
	Education	-.0870	-.24	.005
	Marital Status	.1156	.21	.010
	Health Status	.1072	.24	.009
Stage 2	Vocabulary	.2182	.33	.036 <sup>a</sup>
Stage 3	Extraversion	.0802	.07	.006
	Neuroticism	-.0229	.01	<.001
	Locus of Control	.0498	-.06	.002
	Intellectual Activities	-.0572	-.19	.002
	Support Satisfaction	-.2088	-.12	.035 <sup>a</sup>
Stage 4	Lifetime Drinking-Time 1	.0467	-.13	.002

Note.  $R^2 = .41$ ;  $R^2 = .33$  for Step 1;  $\Delta R^2 = .04$  for Step 2, ( $p < .01$ );  $\Delta R^2 = .05$  for Step 3, (ns);  $\Delta R^2 = .00$  for Step 4, (ns). Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, NotMarried = 2. Health Status: Higher Scores = Poorer Health. Vocabulary: Higher Scores = Poorer Performance. Support Satisfaction: Higher Scores = Less Satisfaction. Frontal Factors 1 and 2: Higher scores = Poorer Performance. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .

Only the demographic variable of age contributed significantly to the regression equation ( $t = 5.48, p < .0001$ ) with being younger associated with better performance. The inclusion of vocabulary in the second stage led to an increase in the variance explained to 36.2%. The change in variance explained of 3.7% was significant ( $F = 6.32, p < .05$ ) as was the overall regression equation,  $F(6,108) = 10.23, p < .0001$ . Age retained its significant effects on frontal cognitive performance ( $t = 5.23, p < .0001$ ) and performance on the vocabulary test also emerged as a significant predictor ( $t = 2.51, p < .05$ ). The addition of Time 1 psychosocial variables at the third stage led to a nonsignificant increase in variance explained of 5% ( $R^2 = 41.3\%$ ). The overall regression equation remained significant,  $F(11, 103) = 6.59, p < .0001$ . Age ( $t = 4.81, p < .0001$ ) and vocabulary ( $t = 2.46, p < .05$ ) remained significant and satisfaction with one's social supports also emerged as a significant predictor ( $t = -2.47, p < .05$ ). The amount of variance explained in frontal scores remained essentially unchanged at 41.5% with the addition of the lifetime alcohol consumption variable in the last stage. Consistent with this finding, lifetime drinking contributed less than .1% of unique variance to frontal cortical functioning. The overall regression equation remained significant,  $F(12,102) = 6.02, p < .0001$ . As in the previous stage, the same variables of age ( $t = 4.81, p < .0001$ ), vocabulary ( $t = 2.51, p < .05$ ) and support satisfaction ( $t = -2.49, p < .05$ ) continued to retain their significant effects on frontal performance. Age contributed 13.3% of unique variance to frontal performance, while vocabulary and support satisfaction contributed much less with 3.6% each.

The same set of demographic, psychosocial and alcohol consumption variables was used in a direct entry hierarchical regression to predict Time 1 temporal cortical functioning as measured by digit span performance. For the regression using lifetime drinking levels at Time 1, the total amount of variance

explained was lower than for frontal scores at 17.5%. Demographic variables entered at the first stage explained 12.7% of the variance in digit span scores,  $F(5, 109) = 3.17, p < .01$ . No variable emerged as a significant predictor at this stage. Entry of vocabulary in the second stage led to a nonsignificant increase in variance explained of .8% ( $R^2 = 13.5\%$ ) while the regression equation remained significant,  $F(6, 108) = 2.81, p < .01$ . As in the previous stage, no variable emerged as a significant predictor at this stage. The addition of psychosocial variables in the third stage was associated with an increase in the amount of variance explained to 17.4%. This increase was not significant. At this stage, the overall regression equation,  $F(11, 103) = 1.97, p < .05$ , remained significant. At this stage, only the variable of satisfaction with one's supports ( $t = 2.02, p < .05$ ) emerged as a significant predictor of performance on the digit span test at initial testing. The same pattern of findings continued with entry of the alcohol consumption variable in the last stage. The amount of variance explained remained essentially the same as in the previous stage ( $R^2 = 17.5\%$ ). The overall regression equation remained significant,  $F(12, 102) = 1.80, p < .05$ . As in the previous stage, support satisfaction ( $t = 2.02, p < .05$ ) continued to significantly predict temporal functioning with a contribution of 3.9% in unique variance. As with frontal cerebral functioning, initial lifetime levels of alcohol consumption did not emerge as a significant predictor of performance on a test reflecting temporal cerebral functioning at Time 1 (See Table 8).

The second set of regression analyses evaluated the concurrent relationship between current alcohol consumption and neuropsychological functioning at Time 2. Theoretically relevant sociodemographic, intelligence and psychosocial factors served as control variables. One difference to be noted is that the individual's age at the time of follow-up replaced the individual's age obtained at initial testing. The regression of Time 2 current alcohol consumption

Table 8

Results of Final Stage of Regression Analysis with Time 1 Lifetime Drinking  
Predicting Time 1 Temporal Cortical Functioning (N=115)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	-.1154	-.20	.008
	Age .	-.1420	-.23	.014
	Education	.1968	.27	.027
	Marital Status	-.1039	-.17	.008
	Health Status	-.0378	-.10	.001
Stage 2	Vocabulary	-.0855	-.22	.005
Stage 3	Extraversion	.0204	-.01	<.001
	Neuroticism	.0281	-.02	<.001
	Locus of Control	.0995	.11	.008
	Intellectual Activities	-.0245	.05	<.001
	Support Satisfaction	.2011	.09	.033 <sup>a</sup>
Stage 4	Lifetime Drinking-Time 1	-.0274	.17	<.001

Note.  $R^2 = .17$ ;  $R^2 = .32$  for Step 1;  $\Delta R^2 = .04$  for Step 2, ( $p < .01$ );  $\Delta R^2 = .05$  for Step 3, (ns);  $\Delta R^2 = .00$  for Step 4, (ns). Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, NotMarried = 2. Health Status: Higher Scores = Poorer Health. Vocabulary: Higher Scores = Poorer Performance. Support Satisfaction: Higher Scores = Less Satisfaction. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .



levels on Time 2 scores of frontal cortical functioning indicated that 40% of the total variance in follow-up frontal scores was accounted for by the variables in this analysis (see Table 9). The adjusted variance accounted for was lower at 33%. Stage 1 demographic variables explained 24.1% of the variance in follow-up frontal scores,  $F(5,109) = 6.91, p < .0001$ . At this stage, the demographic variables of age ( $t = 3.25, p < .005$ ) and education ( $t = -2.22, p < .05$ ) emerged as significant predictors. The inclusion of vocabulary in the second stage led to an increase in the variance explained to 36.2%,  $F(6,108) = 10.20, p < .0001$ . This increase in variance explained of 12.1% was significant ( $F \text{ Change} = 20.45, p < .0001$ ). From the previous stage, only age retained its significant effects on follow-up frontal cognitive performance ( $t = 2.90, p < .005$ ). Health status ( $t = 2.21, p < .05$ ) and vocabulary ( $t = 4.52, p < .001$ ) also emerged as significant predictors at this stage. The addition of the psychosocial variables in the third stage led to a nonsignificant increase in variance explained of 2.5% ( $R^2 = 38.6\%$ ). The overall regression equation remained significant,  $F(11,103) = 5.89, p < .0001$ . The same variables of age ( $t = 2.30, p < .05$ ), health status ( $t = 2.37, p < .05$ ) and vocabulary ( $t = 4.42, p < .0001$ ) remained significant. The amount of variance explained increased slightly to 40% with the addition of the Time 2 current alcohol consumption variable in the last stage. The overall regression equation remained significant,  $F(12,102) = 5.66, p < .0001$ . As in the previous two stages, being younger ( $t = 2.18, p < .05$ ), in better health ( $t = 2.40, p < .05$ ) and having higher scores on a measure reflective of crystallized intelligence ( $t = 4.36, p < .0001$ ) are associated with better performance on a follow-up measure of frontal cortical functioning. Vocabulary contributed 11% of unique variance in follow-up frontal scores followed by age contributing 3% and health status also explaining 3%.

The same set of variables was used in a direct entry hierarchical

Table 9

Results of Final Stage of Regression Analysis with Current Drinking at Time 2  
Predicting Time 2 Frontal Cortical Functioning (N=115)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	-.1124	.08	.007
	Age .	.2016	.42	.028 <sup>a</sup>
	Education	-.0884	-.29	.005
	Marital Status	.0231	.12	<.001
	Health Status	.2038	.30	.034 <sup>a</sup>
Stage 2	Vocabulary	.3802	.46	.112 <sup>d</sup>
Stage 3	Extraversion	.0280	.06	.001
	Neuroticism	.0082	.03	<.001
	Locus of Control	.0202	-.16	<.001
	Intellectual Activities	-.0859	-.19	.006
	Support Satisfaction	-.1462	-.03	.017
Stage 4	Current Drinking-Time 2	-.1449	-.28	.014

Note.  $R^2 = .40$ ;  $R^2 = .24$  for Step 1, ( $p < .001$ );  $\Delta R^2 = .12$  for Step 2, ( $p < .001$ );  $\Delta R^2 = .02$  for Step 3, (ns);  $\Delta R^2 = .00$  for Step 4, (ns). Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, NotMarried = 2. Health Status: Higher Scores = Poorer Health. Vocabulary: Higher Scores = Poorer Performance. Support Satisfaction: Higher Scores = Less Satisfaction. Frontal Factors 1 and 2: Higher scores = Poorer Performance. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .

regression to predict Time 2 temporal cortical functioning as measured by digit span performance obtained during the follow-up phase of testing (see Table 10). The total amount of variance accounted for was 33.9% (adjusted = 26.2%). Demographic variables entered in the first stage explained 30.1% of the variance in follow-up digit span scores,  $F(5,109) = 9.41, p < .0001$ . Younger individuals ( $t = -4.88, p < .0001$ ) with higher levels of education ( $t = 2.43, p < .05$ ) performed better on the digit span subtest at follow-up. Entry of vocabulary in the second stage led to a nonsignificant increase in the variance explained of .8% ( $R^2 = 31\%$ ). Age ( $t = -4.69, p < .0001$ ) and education ( $t = 2.08, p < .05$ ) remained as the only significant predictors at this stage. The regression equation also remained significant,  $F(6,108) = 8.08, p < .0001$ . The same pattern of findings continued with entry of the psychosocial variables in the third stage. The amount of variance explained increased nonsignificantly to 33.9% while the regression equation remained significant,  $F(11,103) = 4.80, p < .0001$ . The same two variables emerged as significant predictors. Entry of the current alcohol consumption variable in the last stage did not add significantly to the amount of variance explained in follow-up digit span scores. The regression equation remained significant,  $F(12,102) = 4.37, p < .0001$ , as did the demographic variables of age ( $t = -4.45, p < .0001$ ) and education ( $t = 2.37, p < .05$ ). The greater importance of age in accounting for digit span performance is reflected in the substantially greater amount of unique variance that it contributes to follow-up temporal performance (13%) in contrast to education (4%).

The availability of scores on neuropsychological measures at the follow-up stage of testing and on the alcohol measures at the initial phase of the research allowed for the investigation of the longterm relationship between lifetime alcohol consumption and neuropsychological functioning. The same set of Time 1 independent variables were used in two direct entry hierarchical regressions to

Table 10

Results of Final Stage of Regression Analysis with Current Drinking at Time 2  
Predicting Time 2 Temporal Cortical Functioning (N=115)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	.0156	-.09	<.001
	Age .	-.4313	-.46	.128 <sup>d</sup>
	Education	.2290	.33	.036 <sup>a</sup>
	Marital Status	-.1486	-.26	.017
	Health Status	.0957	-.05	.007
Stage 2	Vocabulary	-.0989	-.26	.008
Stage 3	Extraversion	-.0147	-.02	<.001
	Neuroticism	.0248	.00	<.001
	Locus of Control	-.0119	.04	<.001
	Intellectual Activities	-.0431	.10	.002
	Support Satisfaction	.1622	.08	.022
Stage 4	Current Drinking-Time 2	-.0203	.15	<.001

Note.  $R^2 = .34$ ;  $R^2 = .30$  for Step 1;  $\Delta R^2 = .01$  for Step 2, (ns);  $\Delta R^2 = .03$  for Step 3, (ns);  $\Delta R^2 = .00$  for Step 4, (ns). Gender: Male = 1, Female = 2.. Marital Status: Married/Cohabiting = 1, NotMarried = 2.. Health Status: Higher Scores = Poorer Health. Vocabulary: Higher Scores = Poorer Performance. Support Satisfaction: Higher Scores = Less Satisfaction. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .

examine neuropsychological functioning at follow-up.

In the first regression, Time 1 lifetime alcohol consumption was used to predict frontal cerebral functioning at Time 2. The results indicate that 38.6% of the variance was accounted for in follow-up frontal scores while the adjusted variance was lower at 31.4%. Demographic variables were entered in the first stage and accounted for 24.1% of the variance explained,  $F(5,109) = 6.91, p < .0001$ . Younger ( $t = 3.25, p < .005$ ) and more educated individuals ( $t = -2.22, p < .05$ ) performed better on measures indicative of frontal cortical functioning obtained at follow-up. There was a significant increase in the amount of variance explained ( $F = 20.45, p < .0001$ ) to 36.2% with entry of vocabulary scores in the second stage. Consistent with the previous stage, age ( $t = 2.91, p < .005$ ) retained its significant effects on frontal functioning at Time 2. In addition, health status ( $t = 2.21, p < .05$ ) and vocabulary ( $t = 4.52, p < .0001$ ) also emerged as significant predictors at this stage. The regression equation was also significant,  $F(6,108) = 10.20, p < .0001$ . The addition of the psychosocial variables in the third stage led to a nonsignificant increase in  $R^2$  to 38.6%. The inclusion of psychosocial variables did not add significantly to the amount of variance explained in frontal functioning at Time 2 beyond that of age ( $t = 2.30, p < .05$ ), health status ( $t = 2.37, p < .05$ ) as well as vocabulary ( $t = 4.42, p < .0001$ ). The overall regression equation remained significant,  $F(11,103) = 6.03, p < .0001$ . With the addition of the Time 1 lifetime alcohol consumption variable in the last stage, the amount of variance explained remained unchanged. The regression equation remained significant,  $F(12,102) = 5.35, p < .0001$ . At this stage, the same three variables of age ( $t = 2.27, p < .05$ ), health status ( $t = 2.36, p < .05$ ) and vocabulary ( $t = 4.32, p < .0001$ ) remained significant predictors of longterm frontal functioning. The amount of unique variance contributed by these variables ranged from 11.2% for vocabulary to 3.1% for age (see Table 11).

Table 11

Results of Final Stage of Regression Analysis with Time 1 Lifetime Drinking  
Predicting Time 2 Frontal Cortical Functioning (N=115)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	-.0589	.08	.002
	Age	.2122	.42	.031 <sup>a</sup>
	Education	-.1190	-.29	.010
	Marital Status	.0159	.12	<.001
	Health Status	.2034	.30	.033 <sup>a</sup>
Stage 2	Vocabulary	.3855	.46	.011 <sup>d</sup>
Stage 3	Extraversion	.0213	.06	<.001
	Neuroticism	-.0058	.03	<.001
	Locus of Control	-.0067	-.16	<.001
	Intellectual Activities	-.0891	-.19	.007
	Support Satisfaction	-.1448	-.04	.017
Stage 4	Lifetime Drinking-Time 1	-.0148	-.21	<.001

Note.  $R^2 = .39$ ;  $R^2 = .24$  for Step 1;  $\Delta R^2 = .12$  for Step 2, ( $p < .0001$ );  $\Delta R^2 = .02$  for Step 3, (ns);  $\Delta R^2 = .00$  for Step 4, (ns). Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, NotMarried = 2. Health Status: Higher Scores = Poorer Health. Vocabulary: Higher Scores = Poorer Performance. Support Satisfaction: Higher Scores = Less Satisfaction. Frontal Factors 1 and 2: Higher scores = Poorer Performance. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .

A second regression analysis examined the effects of retrospectively reported lifetime alcohol use at Time 1 on temporal cortical functioning at Time 2 while controlling for the effects of sociodemographic, intelligence and psychosocial variables (see Table 12). The results indicated that the variables accounted for 34% (adjusted  $R^2 = 26.2\%$ ) of the variance in follow-up digit span scores. Demographic variables entered in the first stage explained 30% of the variance in follow-up digit span scores,  $F(5, 109) = 9.41, p < .0001$ . Younger individuals ( $t = -4.88, p < .0001$ ) with higher education levels ( $t = 2.43, p < .05$ ) performed significantly better on this test. The addition of vocabulary in the second stage led to a nonsignificant increase in variance explained to 31%. The regression equation remained significant,  $F(6, 108) = 8.08, p < .0001$ . The same demographic variables of age ( $t = -4.69, p < .0001$ ) and education ( $t = 2.08, p < .05$ ) retained their significant effects on follow-up digit span performance. A nonsignificant increase in the amount of variance explained in temporal functioning scores of 2.9% ( $R^2 = 33.9$ ) was observed with the addition of psychosocial variables in the third stage. The demographic variables of age ( $t = -4.64, p < .0001$ ) and education ( $t = 2.41, p < .05$ ) retained their significant effects on temporal functioning. The overall regression equation was also significant,  $F(11, 103) = 4.80, p < .0001$ . The addition of the alcohol consumption variable in the last stage did not lead to any increases in the amount of variance explained with  $R^2$  remaining essentially unchanged at 34%. The overall equation was significant  $F(12, 102) = 4.38, p < .0001$ . As in the previous stage, the same two variables of age ( $t = -4.46, p < .0001$ ) and education ( $t = 2.42, p < .05$ ) significantly predicted long-term temporal functioning. Age contributed 12.9% of unique variance to the variance in temporal cognitive functioning at Time 2 while education contributed 3.8% of unique variance.

Table 12

Results of Final Stage of Regression Analysis with Time 1 Lifetime Drinking Predicting Time 2 Temporal Cortical Functioning (N=115)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	.0135	-.09	<.001
	Age .	-.4315	-.46	.129 <sup>d</sup>
	Education	.2334	.33	.038 <sup>a</sup>
	Marital Status	-.1498	-.26	.018
	Health Status	.0961	-.05	.008
Stage 2	Vocabulary	-.1033	-.26	.008
Stage 3	Extraversion	-.0119	-.02	<.001
	Neuroticism	.0246	.00	<.001
	Locus of Control	-.0098	.04	<.001
	Intellectual Activities	-.0432	.10	.002
	Support Satisfaction	.1643	.08	.022
Stage 4	Lifetime Drinking-Time 1	-.0374	.15	.001

Note.  $R^2 = .34$ ;  $R^2 = .30$  for Step 1;  $\Delta R^2 = .01$  for Step 2, (ns);  $\Delta R^2 = .03$  for Step 3, (ns);  $\Delta R^2 = .00$  for Step 4, (ns). Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, NotMarried = 2. Health Status: Higher Scores = Poorer Health. Vocabulary: Higher Scores = Poorer Performance. Support Satisfaction: Higher Scores = Less Satisfaction. All other variables are scored in the positive direction.

Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .



### Alcohol consumption and well-being

Direct entry hierarchical multiple regressions were performed in order to address the question of the effects of lifetime levels of alcohol consumption at Time 1 on subjective well-being after controlling for the effects of demographic and psychosocial variables. Well-being was defined by total scores for global well-being as measured on the MUNSH. As in the previous regression analyses, independent variables were entered in the following order: five demographic variables (gender, age, years of education, marital status, health status), five psychosocial variables at Time 1 (extraversion, neuroticism, belief, involvement in social activities, support satisfaction). The lifetime alcohol consumption variable was entered in the last stage.

The results of the regression predicting global happiness scores at Time 1 indicated that 41.7% of the variance in MUNSH scores was explained by the variables in this analysis. The adjusted amount of variance explained was lower at 36%. The first stage demographic variables explained 20.9% of the variance in total well-being scores,  $F(5, 117) = 6.18, p < .0001$ . Males ( $t = 2.27, p < .05$ ), younger individuals ( $t = 1.99, p < .05$ ) and individuals in better health ( $t = 3.17, p < .005$ ) had higher total well-being scores. The addition of the second stage psychosocial variables increased the amount of variance explained to 41.4%,  $F(10, 112) = 7.90, p < .0001$ . This change in  $R^2$  was significant at  $p < .0001, F = 7.81$ . The demographic variable of health status retained its significant effects on total MUNSH scores ( $t = 2.72, p < .05$ ). Among the second stage psychosocial variables, neuroticism scores significantly predicted well-being ( $t = 3.46, p < .001$ ). In line with the previous literature, individuals who had higher scores on the neuroticism scale tended to be less happy as measured on the MUNSH. In addition to neuroticism, locus of control ( $t = -2.72, p < .001$ ) and involvement in socially oriented activities ( $t = -2.84, p < .005$ ) also emerged as significant

predictors of well-being as measured on the MUNSH. The entry of the last stage lifetime alcohol consumption variable into the regression analysis did not lead to any significant increase in the amount of variance already explained by demographic and psychosocial variables although the overall regression equation remained significant,  $F(11, 111) = 7.23, p < .0001$ . As in the previous stage, health status ( $t = 2.72, p < .01$ ), neuroticism ( $t = 3.51, p < .001$ ), locus of control ( $t = -2.54, p < .01$ ) and involvement in socially oriented activities ( $t = -2.80, p < .01$ ) retained their significant effects on total well-being scores as measured on the MUNSH (see Table 13). Among the significant predictors, neuroticism contributed the highest amount of unique variance (6.5%). The unique variance accounted for by the remaining three variables was lower and ranged from 3.4% to 4.1%.

### Additional Analyses

Additional analyses were conducted to investigate further the hypotheses of age-related declines in alcohol consumption levels and the effects of socioeconomic status on drinking levels. The mean number of maximum weekly drinks in 5-year intervals for each subject were used to construct lifespan curves (Chaikelson et al., 1995) depicting mean levels of lifetime drinking at each interval from 20 to 70 years of age. The standard error of the mean was also calculated and included for each data point. Lifespan curves were constructed for males and females of high and low socioeconomic status. Socioeconomic status was derived from the number of years of education completed. Low socioeconomic status was defined as less than 13 years of education while having completed 13 or more years of formal education was defined as high socioeconomic status.

Levels of lifetime drinking for males and females are depicted in Figure 1.

Table 13

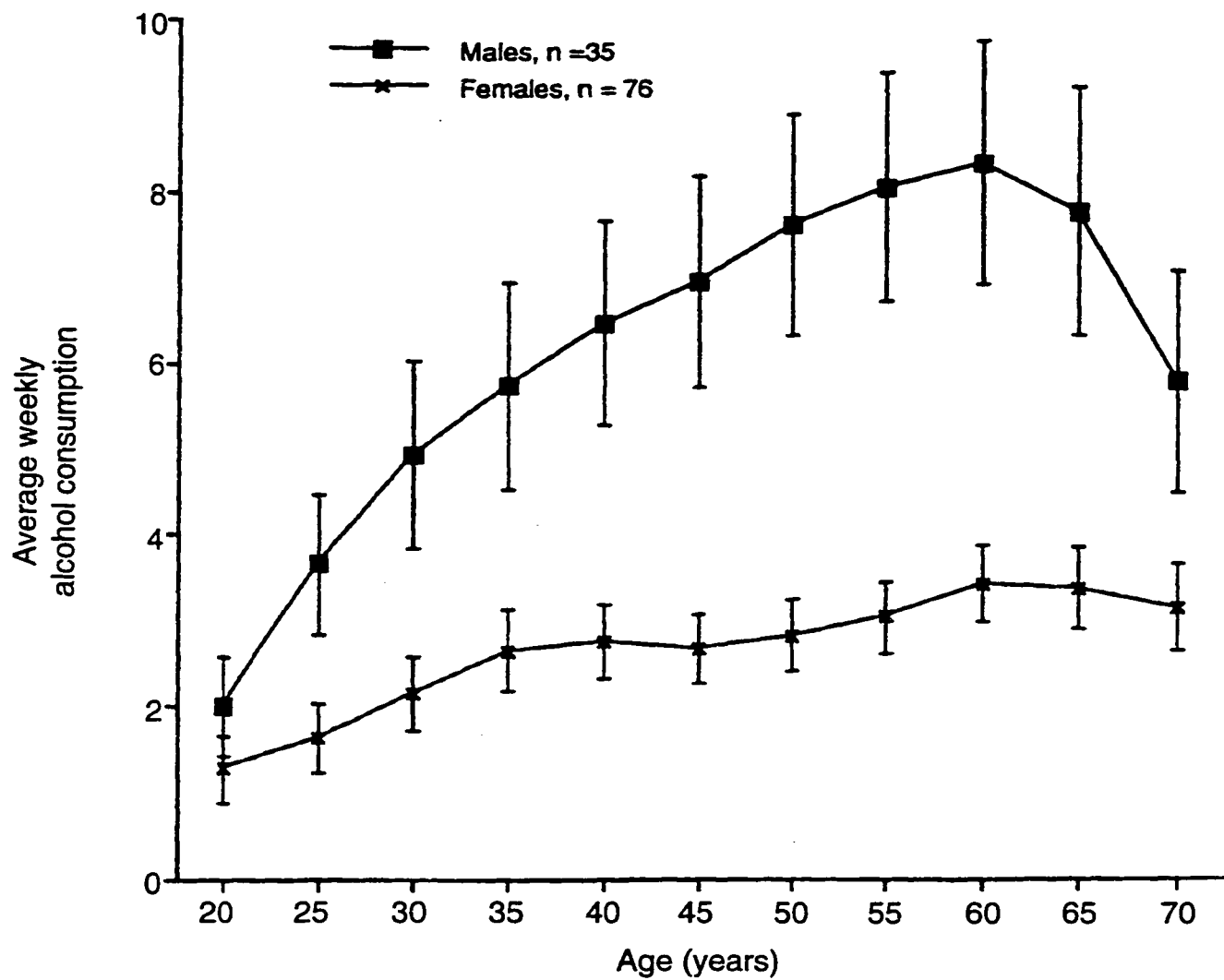
Results of Final Stage of Regression Analysis with Lifetime Drinking at Time 1  
Predicting Well-Being at Time 1 (N=123)

	Variable	Beta	r	sr <sup>2</sup>
Stage 1	Gender	.0710	.24	.003
	Age .	.0712	.29	.004
	Education	.0810	-.11	.005
	Marital Status	.0307	.14	.001
	Health Status	.2171	.37	.039 <sup>b</sup>
Stage 2	Extraversion	.1247	.10	.015
	Neuroticism	.2862	.39	.065 <sup>d</sup>
	Locus of Control	-.2023	-.33	.034 <sup>b</sup>
	Social Activities	-.2219	-.38	.041 <sup>b</sup>
	Support Satisfaction	.0687	.24	.004
Stage 3	Lifetime Drinking-Time 1	-.0721	-.18	.004

Note.  $R^2 = .42$ ;  $\underline{R}^2 = .21$  for Step 1;  $\Delta R^2 = .20$  for Step 2, ( $p < .0001$ );  $\Delta R^2 = .00$  for Step 3, (ns).

Gender: Male = 1, Female = 2. Marital Status: Married/Cohabiting = 1, NotMarried = 2. Health Status: Higher Scores = Poorer Health. Support Satisfaction: Higher Scores = Less Satisfaction. MUNSH: Higher scores = Less Well-Being. All other variables are scored in the positive direction.

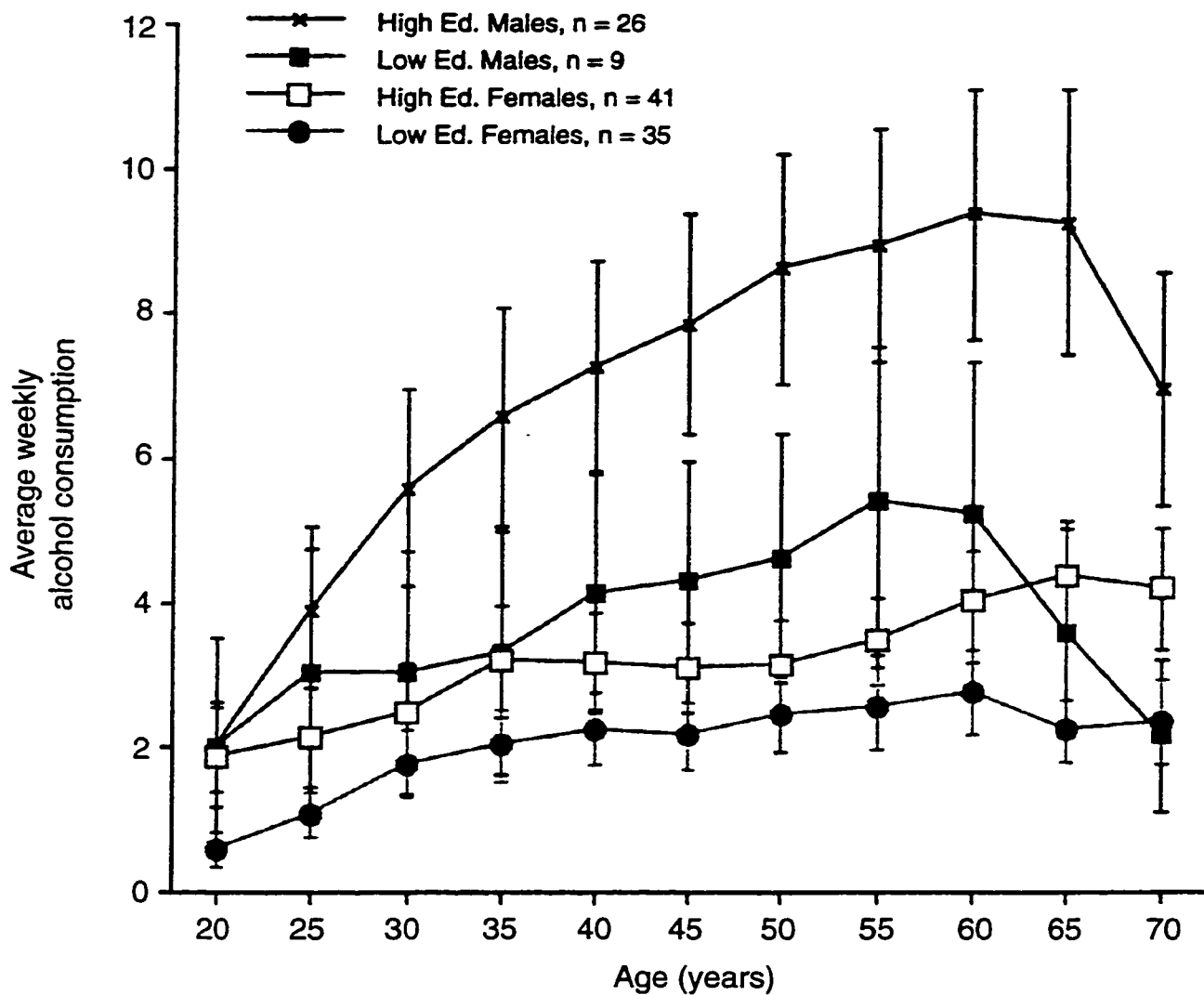
Note. a =  $p < .05$ ; b =  $p < .01$ ; c =  $p < .005$ ; d =  $p < .001$ .



**Figure 1.** Comparison of retrospectively reported weekly lifetime drinking of male and female social drinkers.

The figure indicates higher levels of alcohol consumption for males than females at every five-year period between the ages of 20 and 70. The data also indicate more variability in the alcohol consumption levels of males in contrast to females. When considered separately, the lifespan curve for males generally reflects a steady increase in levels of alcohol consumption until age 60 when levels of alcohol use begin to decline and continue to decline into their 70s. The lifespan curve for females indicates a slight increase in alcohol consumption from the ages of 25 to 40, a levelling off by the age of 55 followed by an increase until age 60 which is then followed by another decline. Despite this last decrease, the data also indicate that women were still drinking more during the last decade (from 60 to 70 years of age) than they had at any other age (see Figure 1).

Figure 2 depicts lifespan curves of alcohol consumption levels for males and females of high and low levels of education. As in Figure 1, the curves tend to indicate a gender difference in levels of alcohol consumption and also indicate the importance of education in influencing levels of drinking for males. Males continue to display higher levels of lifetime alcohol use than females regardless of their socioeconomic status up to age 60. As in the previous figure, the alcohol consumption levels of the males also show more variability as compared to the females. After age 60, there seems to be a trend towards the closing of the gender gap in alcohol consumption levels but only between low education males and females of both education subgroups.



**Figure 2.** Comparison of retrospectively reported weekly lifetime drinking of male and female social drinkers of high and low socioeconomic status (based of years of education).

## Discussion

The study had several objectives. The primary objectives consisted of the empirical testing of various hypotheses relevant to alcohol consumption in elderly social drinkers. Additional objectives comprised the examination of the effects of lifetime and current patterns of moderate alcohol consumption on various aspects of cognitive and psychological functioning. Theoretically relevant sociodemographic, intellectual and psychosocial factors were also included in the analyses as covariates and for the purposes of replicating previous literature findings.

### Correlates of alcohol consumption in adulthood

The epidemiological literature on patterns of alcohol consumption has generally pointed to declines in total lifetime alcohol consumption levels as the individual grows older (Akers & LaGreca, 1991; Arbuckle et al., 1994; Goodwin et al., 1987; Harford & Mills, 1978; Hilton & Clark, 1987). The hypothesis of age-related declines in alcohol consumption was not supported in this research. The results from regression analyses indicated that age failed to emerge as a significant predictor of lifetime alcohol consumption at the initial and follow-up phases of testing. The low correlations between age and indices of alcohol lifetime consumption (with Pearson product-moment correlations of  $-.14$  and  $-.15$ ) further strengthen this finding. These results contradict the bulk of evidence from the literature suggesting such an effect. A potential explanation for this lack of expected findings may be linked to the restricted range of variance in the age variable of the present sample.

In addition to an age-related decline in alcohol consumption, the epidemiological literature on alcohol consumption has also reported that these

initial age-related decreases in alcohol use may stabilize after a certain age, usually after 50 to 60 years of age (Fillmore, 1987a; 1987b). The relatively low and stable patterns of alcohol consumption may have prevented any such stabilization to occur in the present sample. Although the patterns of the lifespan curves on the lifetime levels of alcohol consumption for the present sample do indicate a decrease in levels of alcohol use for both men and women after the age of 60 that is consistent with other findings (Arbuckle et al., 1993), the decrease may not have been large enough to produce any significant statistical effects for this sample.

The results from regression analyses indicated that males consumed significantly more alcohol during their adulthood in contrast to their female counterparts. This finding was replicated for both initial and follow-up phases of the study. This result also supports previous empirical findings of gender-related differences in alcohol consumption (Arbuckle et al., 1992; Barnes et al., 1991; Douglass et al., 1988; Eliany et al., 1992; Falkowski et al., 1986; Goodwin et al., 1987; Graham et al., 1996; Hewitt et al., 1995; Hilton & Clark, 1987; Olenick & Chalmers, 1991; Single & Wortley, 1993). The findings from the regression analyses also argue against the convergence of alcohol consumption levels between males and females for the present sample of elderly social drinkers. It seems that for this sample of elderly social drinkers, the gender gap still remains. The results of the lifespan curve depicted in Figure 1 are also consistent with the finding from the regression analyses of gender-related differences in lifetime alcohol consumption for this sample of elderly social drinkers. The gender difference remains despite a significant influence of socioeconomic status on alcohol use. As reflected in the lifespan curves of lifetime alcohol consumption for males and females of high and low socioeconomic status displayed in Figure 2, much of the difference between males and females seems to be exacerbated



by the high education males. This may account for the significant gender difference in alcohol levels despite the slight overlap that occurred between the low education males and high education females around age 65. However, the higher variability in the alcohol consumption levels of the males in this sample render the conclusions tentative.

Secondary hypotheses in this study were related to the replication of various relationships that have been reported in the literature between alcohol consumption and a number of sociodemographic and psychosocial variables. The specific hypotheses predicted that being more educated and being unmarried would be associated with higher alcohol consumption levels. In this research, years of education was used as an index of socioeconomic status. The results from correlational and multiple regression analyses indicated support for the SES-alcohol consumption link. The emergence of education as a positive predictor of alcohol use in the regression analyses after controlling for the effects of all other variables in the equation further reinforces this conclusion. The correlations of .31 and .32 indicated that initial and follow-up levels of lifetime alcohol consumption increase as socioeconomic status also increases, respectively. The high education males who are drinking more than any other group may have contributed to the findings of a positive link between higher education and higher alcohol consumption levels. This is only speculation since a proper test of this hypothesis with the present sample was not possible due to the small number of males in the low education subgroup.

Despite a trend in the predicted direction, the low negative correlations between marital status and lifetime indices of alcohol consumption levels (-.08, -.09) do not suggest an association between being unmarried and increased alcohol use. This result contradicts previous research findings (Arbuckle et al., 1992; Barnes et al., 1991; Wilsnack et al., 1984). In line with the overall lack of

significant correlations between marital status and alcohol consumption, marital status failed to emerge as a significant predictor of alcohol use in the regression analyses. The small subject sample as well as the different categorizations used for marital status across studies may help to account for the inconsistent findings. Also, the use of only two categories of marital status in this study may have limited the influence of the variable in the analyses. The two-category distinction that was used may not have been descriptive enough and may have limited variance unduly. Past findings have indicated differential effects of marital status on alcohol consumption within each of the categories. For example, the association between being divorced and alcohol consumption may differ from that between never being married and alcohol use. The not married category used in this study may have obscured differences in alcohol consumption between those individuals who are divorced, widowed or never married. A different categorization comprising further breakdown into never married, married/cohabitating, divorced/separated or widowed may reflect more accurately the marital status situation in the elderly and should be considered in future research. The use of such a categorization was not possible in this study due to the small sample size.

Findings from the literature on the psychosocial correlates of alcohol consumption led to the hypotheses that individuals with high scores on scales for extraversion, neuroticism and who are more satisfied with their social supports would consume more alcohol (Allsopp, 1986; Arbuckle et al., 1993; Barnes, 1983; Chaikelson et al., 1987-88; Forsyth & Hundleby, 1987; Lester & Rassas, 1986; Robson, 1989). Higher levels of drinking were also expected for those individuals with an external locus of control (Apao & Damon, 1982; Mariano et al., 1989; Naditch, 1975). These hypotheses were not supported. No significant effects were found for the variables of extraversion, neuroticism, locus of control

and support satisfaction.

When psychosocial variables were entered into the regression equation, the amount of variance explained in alcohol consumption did not increase significantly despite an overall significant regression equation. At this last stage, only the demographic variables of gender and education retained their significance for lifetime alcohol consumption. The findings indicated the relative importance of being a highly educated male in accounting for lifetime alcohol consumption levels in this group of elderly, light social drinkers. With a relatively large amount of variance still unaccounted for, it is possible that other psychosocial variables, untested in this research, may contribute in determining the patterns of alcohol consumption for this sample of elderly social drinkers.

In addition to the potential influence of untested psychosocial variables on alcohol consumption, other methodological shortcomings may have accounted for the lack of significant findings. The small sample size of males as well as the relatively low drinking levels of the sample may have contributed to the present pattern of findings. The mean of approximately 3.4 drinks per week over the individual's adult lifespan place the present sample at the lower end of the spectrum for drinking levels. The alcohol levels may have been too low for any significant findings to emerge. However, such low levels of drinking may be more representative of the levels of alcohol use in the elderly in contrast to the younger segment of the population. The current sample was from a different generation having grown up most likely around the period of prohibition in North America when the use of alcohol was discouraged. These older individuals may have values and beliefs on alcohol consumption that differ from those of their younger cohorts. Researchers should begin to observe higher levels of drinking among older persons in the coming years as the younger generations who were exposed to more liberal views on drinking become part of this group (Hewitt et al., 1995).

A larger sample size that would also include more individuals at the higher end of the social drinking spectrum may provide a more accurate picture of the psychosocial correlates of alcohol consumption. However, heavy drinkers in this age group may be difficult to find due to the higher mortality rate from all causes in such individuals.

### Alcohol and neuropsychological functioning

A primary objective of this research was to examine the effects of moderate levels of alcohol consumption on frontal and temporal indices of cerebral functioning after controlling for relevant sociodemographic, intelligence and psychosocial variables. Two major hypotheses were investigated. Based on Ryback's (1971) continuity theory, the first hypothesis stated that at higher levels of alcohol use, as levels of alcohol consumption increased, cognitive performance would decline. This study examined whether the dose-response relationship between alcohol consumption and cognitive deficits could be extended to lower levels of alcohol consumption in elderly social drinkers. On the basis of previous literature findings, the specificity hypothesis predicted that, if present, alcohol-related cognitive declines would be specific to frontal cortical functions.

The continuity hypothesis was not supported. The results from the regression analyses completed for frontal and temporal cognitive measures obtained at initial testing and follow-up indicated that no alcohol consumption variable emerged as a significant predictor of cortical functioning after controlling for the effects of sociodemographic, intellectual and psychosocial variables. This finding suggests the absence of a dose-response relationship between more moderate levels of drinking and performance on tasks reflective of frontal and temporal cerebral functioning for this sample. With the use of an alcohol

measure reflecting alcohol use over the lifespan, the lack of significant findings argues against the notion of longterm negative effects of moderate levels of alcohol consumption on cognitive functioning. In line with the absence of significant findings for the continuity hypothesis, the present results also refute the specificity hypothesis.

Overall, the results from analyses investigating the relationship between alcohol consumption and neuropsychological functioning have provided no evidence for either continuity or specificity of alcohol-related cognitive effects in this sample of elderly social drinkers. The present findings contradict those of previous studies that have found evidence of alcohol-related negative effects on cognitive functions (Hannon et al., 1983; Lyvers & Maltzman, 1991; MacVane et al., 1982; Parker & Noble, 1977; Parker et al., 1980; Parker et al., 1983; Arbuckle et al., 1993). Despite this positive evidence, a number of studies failed to find such results (Arbuckle et al., 1995) or have reported findings pointing to differential alcohol-related cognitive effects for different subgroups of social drinkers. Specifically, these studies reported no significant correlations between various measures of drinking and cognitive functions for light social drinkers but significant findings were reported when heavy social drinkers were part of the sample (Parker et al., 1991; Parsons & Fabian, 1982). The findings imply that alcohol-related cognitive impairments may be limited to heavy alcohol consumption and do not extend to moderate levels of consumption. The findings also suggest that these effects may become measurable only after prolonged moderate or heavy social drinking.

In addition to the small sample size, the lack of significant findings in the present study may have been due to the majority of subjects falling in the light social drinking range and the relative absence of heavy social drinkers. Alcohol consumption levels in this sample may have been too low to produce statistically

significant and reliable decrements in cognitive functioning. The mean levels of maximum lifetime drinking at Times 1 and 2 for this sample (3.4 and 3.6 drinks per week, respectively) were found to fall at the lower end of the drinking levels spectrum reported in other studies (from 5.8 to 33.8 weekly drinks) that have found significant effects with the same drinking questionnaire (Arbuckle et al., 1993; 1994). The alcohol levels for this sample were also significantly lower when compared to those reported by Parker and Noble (1977).

The differences in measures of neuropsychological functions and alcohol consumption used across studies may also contribute to the pattern of inconsistent findings in this area. The use of frontal factors instead of the individual measures in the present study may not have been sufficiently sensitive or specific to detect reliably the effects of alcohol on cognitive functions. However, for statistical reasons, the relatively small sample size and the large number of variables warranted the use of these factors. In addition to different cognitive measures, the measures of alcohol consumption used in this study differed from those used in the landmark study of Parker and Noble (1977) and other attempts at replication. The nature of the alcohol indices used in this study may not have been the appropriate ones to use as predictors of cognitive performance. Past studies that have found evidence supporting a dose-response relationship between alcohol consumption and cognitive functioning used quantity of alcohol consumed per drinking occasion as their measure of drinking. This data was not available for this study. In relation to the nature of the drinking questionnaire used in this study, the accuracy of self-reporting as well as the retrospective nature of the data on lifetime drinking warrants cautious interpretation of the findings.

Inconsistent results were obtained for the secondary hypotheses. The results from the multiple regression analyses provided partial support for the

hypothesis predicting age-related declines in cognitive functioning. This finding was obtained for the multiple regressions predicting frontal cognitive functioning at initial testing and at follow-up and for temporal functioning at follow-up only. Age retained its significant effects on cognitive functioning even after the inclusion of intellectual, psychosocial and alcohol consumption variables in the regression equation. This finding implies that cognitive processes of concept formation and set flexibility are sensitive to the later effects of aging to a greater extent and more quickly than verbal memory processes.

The hypothesis that there would be no gender-related differences in cognitive performance was also supported for this sample. This implies that cognitive performance can be generalized across gender once other relevant demographic variables are statistically controlled. The hypothesis predicting a positive association between education and cognitive performance was partially supported. A significant result of a positive association between education and cognitive functioning was found for temporal cognitive functioning but not for frontal functioning. These results suggest that education may provide individuals with an opportunity to develop skills or strategies that would enable them to practice their memory skills and in turn may help to maintain their verbal memory.

The stronger positive correlation between self-reported health and frontal functioning at follow-up is consistent with health significantly predicting frontal cortical functioning at Time 2 only. The findings imply that for this sample, physical well-being exerts protective effects on frontal cognitive functions specifically and that these effects tend to occur over longer periods of time. The positive findings for the health status variable are consistent with previous empirical findings favoring a positive relationship between health and cognitive functioning (Field et al., 1988; Hultsch et al., 1993; Perlmutter & Nyquist, 1990).

The hypothesis of a positive association between intelligence and

cognitive functioning was partially supported. Consistent with the results of past research (Arbuckle et al., 1993), vocabulary emerged as a significant positive predictor of frontal functioning at initial testing and follow-up. Higher scores on the vocabulary subtest were associated with better performance on the measures of cognitive flexibility used in this study. However, the positive findings failed to extend to temporal functioning. In contrast to using vocabulary, a different measure of intelligence may have produced different effects for digit span in this study. The lack of significant findings could also have been due to the measure of temporal functioning used in this study. The study that found a positive relationship between vocabulary and memory (Arbuckle et al., 1992) used only forward digit span as opposed to the present study that used a measure of total digit span comprising both forward and backward digit span. Different cognitive processes may be at play in backward digit span and may have interacted differently with vocabulary to produce the present findings.

The past literature on the psychosocial correlates and predictors of neuropsychological functioning reported a number of relationships between various psychosocial variables and indices of cognitive functioning. The results obtained from the present analyses indicated that with the exception of support satisfaction, the psychosocial variables included in this research had no significant effects on the cognitive variables. The expected findings for the personality traits of extraversion and neuroticism were not observed. The results for support satisfaction indicated a negative relationship between support satisfaction and cognitive functioning at Time 1. This implies that more satisfaction with one's supports is related to poorer performance on tests of frontal and temporal functioning. However, the inconsistency of the findings and the unexpected direction of the relationship led to interpreting this as a statistical artifact.



The positive associations that were hypothesized for internal locus of control and involvement in intellectually oriented activities were also not found. In contrast to a number of demographic variables, this pattern of findings suggests the relative lack of influence of personality characteristics and other psychosocial variables on cognitive functioning in this sample of elderly social drinkers. The findings also imply that the potential influence of psychosocial variables on cognitive functioning is virtually eliminated when the specific sociodemographic factors of age and education are taken into consideration. In line with the argument proposed for predicting alcohol consumption, it is possible that psychosocial variables not included in the present research may be contributing to cognitive performance. The relatively small amount of variance accounted for in cognitive measures tends to support such a possibility. In addition, the relatively small size of the present sample may have influenced the pattern of findings.

The general pattern of findings from these analyses seem to indicate the importance of age, education, health and intelligence in accounting for differences in specific indices of frontal and temporal cognitive functioning for this group of elderly social drinkers.

#### Alcohol consumption and well-being

A last area of focus in this research examined the effects of moderate levels of alcohol consumption on a global index of subjective well-being after controlling for the effects of theoretically relevant sociodemographic and psychosocial variables. A global measure of subjective well-being was obtained on the MUNSH .

The relatively few studies that have examined the relationship between indices of alcohol use and subjective well-being have generally reported

inconsistent findings (Arbuckle et al., 1993; Arbuckle et al., 1995; Gillis & Hirdes, 1995; Gold et al., 1991; Hingson et al., 1981; Schonfeld & Dupree, 1991). The purpose of this research was to add to the literature in this area. The results from this study failed to indicate a significant association between moderate levels of lifetime drinking and general subjective well-being. The results suggest that consuming alcohol socially in this group of relatively healthy older individuals does not significantly influence their sense of well-being.

A number of factors may have accounted for the lack of a significant relationship being demonstrated between alcohol consumption and subjective well-being. The measure used in the present study to assess subjective well-being may have been too general to examine adequately the relationship between the two variables. It is possible that alcohol has differential effects on an individual's satisfaction in various domains of their life and this may be obscured by using a measure that provides a global index of well-being. In addition, past research has demonstrated empirically the distinction between the different affect dimensions of well-being (Diener & Emmons, 1984; Diener et al., 1985; Diener et al., 1991; Headey et al., 1984; 1985; Lawton et al., 1992). It may be that alcohol has no relationship with the positive affect dimension of well-being but may influence the negative affect dimension of well-being. The levels of alcohol consumption for this sample were at the low end of the social drinking range and may have been too low to produce statistically reliable findings. The inclusion of heavier social drinkers in the sample would provide a more accurate test of the relationship. Just as in the relationship between alcohol use and cognitive functioning, it may be that higher levels of alcohol use are needed in order to influence one's general sense of well-being. The small sample size also limited the validity and generalizability of the findings.

In contrast to the literature on the alcohol and subjective well-being link,

there is an extensive literature on the epidemiology of subjective well-being as well as its psychosocial correlates and predictors. Among the sociodemographic variables studied in relation to subjective well-being, marital status and self-reported health were expected to emerge as significant positive predictors of general well-being.

With the exception of the findings for marital status and well-being, the general findings of this research are consistent with the past literature in that no significant findings were revealed for other sociodemographic variables with the exception of self-reported health. The lack of gender-related differences in well-being implies that well-being is influenced by similar variables or processes in both men and women. Although the correlation between marital status and subjective well-being was in the predicted direction (-.15) reflecting higher levels of self-reported subjective well-being for married individuals, the effect failed to reach statistical significance in both correlational and regression analyses. A number of factors such as the small sample size and the different categories that are used for marital status across studies may help to explain the inconsistent results. The hypothesis for the beneficial effects of good health on general subjective well-being was supported in the present research. Better self-reported health was associated with a greater sense of well-being. The present findings imply that for the aging individual, being in good health plays an important role in helping to contribute to a sense of well-being.

The literature on the psychosocial correlates of subjective well-being has provided a preponderance of evidence favoring the association between subjective well-being and a number of psychosocial factors. Among the psychosocial variables studied, extraversion, internal locus of control, satisfaction with available supports and involvement in socially oriented activities were expected to make significant, positive contributions to general well-being. In

contrast, neuroticism was expected to influence negatively general well-being.

The lack of significant findings for the link between the central personality trait of extraversion and subjective well-being was unexpected based on the extensive literature supporting such a link (Argyle & Lu, 1990; Costa & McCrae, 1980; Costa et al., 1981; Furnham & Brewin, 1990; Hotard et al., 1989; McCrae & Costa, 1991; Pavot et al., 1990). However, there may have been differences in the construct of extraversion as defined and measured by the EPI in comparison to the NEO Personality Inventory that was used in the bulk of previous research. In contrast to the results for extraversion, the results for neuroticism were consistent with previous findings (Costa et al., 1981; Diener et al., 1992; Hotard et al., 1989). The results from this research supported the hypothesis that high levels of neuroticism would have a negative effect on one's general sense of well-being.

The general findings for the associations between subjective well-being and central personality traits seem to indicate that for this sample, being more extraverted as defined by Eysenck and as measured by the EPI does not seem to influence one's sense of well-being. Individuals who are more introverted seem to be just as happy and satisfied with their lives as their more extraverted counterparts. On the other hand, individuals who are more emotionally labile and who tend to worry (reflected in higher neuroticism scores) tend to be less happy and satisfied with their lives.

In addition to extraversion, the psychosocial literature has pointed to a link between locus of control and various indices of well-being (Brown & Granick, 1983; Hickson et al., 1988; Larson, 1989; Reid et al., 1977; Reid & Ziegler, 1980; Roberts et al., 1994). The literature has generally provided evidence favoring a positive relationship between internal locus of control and well-being. The hypothesis of such a positive relationship was supported in this research.

Individuals who experience a sense of control over major aspects of their lives will tend to be happier generally and more satisfied with their lives in contrast to the individual who feels helpless in influencing major outcomes in their life. The hypothesis of a positive relationship between activity and well-being was also supported. Involvement in socially related activities is positively related to subjective well-being as measured on the MUNSH. This finding is consistent with past research on the activity-subjective well-being link and with continuity theory (Atchley, 1993). The lack of a significant relationship between support satisfaction and well-being and the significant finding for socially-oriented activities imply that being involved in activities that promote social interactions, even if only superficially, is sufficient to enhance one's sense of well-being. The perception of how satisfying one's support networks are does not add significantly to the feelings of well-being for this sample.

With the exception of extraversion and support satisfaction, this research replicated previously established relationships between various psychosocial factors and subjective well-being. It appears that for this sample of elderly social drinkers, good health, being emotionally adjusted, having an internal locus of control and being involved in socially oriented activities seem to be important in determining and maintaining their sense of well-being. Past studies have typically limited the examination of the relationship between psychosocial variables and subjective well-being to one or two psychosocial variables. The present study is one of the few recent studies that has attempted to evaluate simultaneously the effects of various psychosocial factors on subjective well-being in the elderly. In line with the present findings, the few recent studies that have used the same design have reported differential and inconsistent effects on subjective well-being for the psychosocial variables of extraversion, neuroticism, social support and activities (Arbuckle et al., 1993; Arbuckle et al., 1995). The

proposed hypotheses were based on the assumptions that previously established relationships would still hold in this multivariate context. The present findings argue against this assumption and suggest that other more complex relationships, still undiscovered, may be occurring to influence one's sense of well-being. The relatively large amount of variance unaccounted for in well-being also raises the possibility of the potential influence of psychosocial factors on well-being not included in this research.

#### Summary and suggestions for future research

In summary, the findings of this study have contributed to the literature on the correlates and consequences of alcohol consumption in elderly social drinkers. The present findings indicate the relative importance of sociodemographic variables in contrast to personality and other psychosocial variables in accounting for alcohol consumption in this sample. The findings replicated previous results of gender-related differences in alcohol consumption levels. These same findings suggest the absence of convergence in alcohol consumption levels on the basis of education for this sample. A more proper test of the convergence hypothesis would have involved the inclusion of a variable reflecting occupational status as well as a larger number of low education males. The findings from the lifespan curves also pointed to the importance of education (as an index of socioeconomic status) in influencing alcohol consumption levels. Despite gender differences in alcohol consumption, these findings also imply that as women's social and occupational roles change to approximate those of high status men, their alcohol consumption patterns may also change. The results indicate the increasing need to focus on women in future research on alcohol consumption in order to obtain a clearer understanding of alcohol consumption patterns in adulthood.

The failure to find significant age-related declines in alcohol consumption levels in this sample may have been due to the age range of the present sample. Epidemiological data has pointed to a decrease or stabilization in alcohol consumption after the ages of 50 to 60. With an age range between 61 and 90 years of age, the lack of significant findings may be due to the restricted range of variance in the age variable for this sample.

The results from analyses examining the effects of alcohol on neuropsychological functioning have provided no support for either the continuity or specificity theories of alcohol-related effects on cognitive functioning for light social drinkers. A number of methodological shortcomings may have contributed to the lack of findings. These included a small sample size, the relatively low levels of alcohol consumption and the accuracy of a retrospective and self-report drinking questionnaire. These issues need to be addressed in future studies in order to ensure the validity and reliability of their findings. In addition, controlling for the potential confound of the use of various combinations of medications (i.e., benzodiazepines with blood pressure medications) should also be considered in future research.

The inclusion of sociodemographic, intellectual and psychosocial control variables in the analyses led to inconsistent replication of previous findings. The results indicated that sociodemographic covariates of age, education and health significantly predicted cognitive performance when other theoretically and statistically relevant variables were included in the analyses. This indicates that an individual's age, health and level of education seem most important in influencing their cognitive performance on both a short and long term basis. Future studies could focus on potential interactions between the variables to clarify further the nature of their influence on cognitive performance. In view of the small sample and relatively large number of variables, and to preclude

violation of statistical assumptions, such interaction terms were not included in the regression analyses. In addition, the emergence of vocabulary as a significant predictor of frontal functioning underscored the importance of controlling for intelligence in predicting cognitive functioning.

No significant associations were revealed between alcohol consumption and indices of subjective well-being for this sample. This implies that for this group of elderly individuals, moderate use of alcohol does not tend to have any influence on their overall sense of well-being. However, caution is warranted in interpreting the findings due to the limitations of a small sample, a narrow range of low levels of drinking as well as the retrospective nature of the drinking questionnaire.

As in previous research, most sociodemographic variables did not contribute to the individual's sense of well-being. Only self-reported health appeared to play an important role in maintaining one's sense of well-being in this sample of elderly social drinkers. With the exception of extraversion and support satisfaction, findings in the predicted direction were obtained for the other psychosocial factors. Based on the relatively small amount of variance explained in well-being, other psychological factors, not included in this research may be influencing well-being in this sample of elderly social drinkers. The present findings warrant the need for future research with larger samples in attempts to identify and clarify the contributions of various psychosocial variables to well-being within a multivariate context.

The present findings indicated that for this particular group of elderly, middle class controlled drinkers, alcohol consumption appears to be a benign activity with no apparent adverse consequences, whether cognitive or psychological. Alcohol consumption also does not seem to be predicted by negative factors. The overall lack of significant alcohol-related findings may also



suggest a qualitative distinction between social drinkers and individuals who consume alcohol more heavily. This factor indicates the need to focus on social drinkers as a group that is qualitatively different from alcohol abusers and to shift away from the notion of quantitative differences between the two groups, especially when relating to psychosocial variables.

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## CONSENT FORM

I consent to participate in the follow-up research project on Adult Development which is being conducted under the direction of Drs. Gold, Arbuckle-Maag, and Andres of the Psychology Department and Centre for Research in Human Development of Concordia University. I understand that my participation will include providing information about my present life circumstances, responding to a series of questionnaires, and doing other tasks relevant to adult development. I understand that this study is supported by a grant from the government of Canada. With respect to my participation, I understand that:

1. All information provided by me will be kept confidential. I understand that although the results of this study will be reported, the information provided in the report will be based on the entire group of volunteers. That is, no individual's data will be reported.
2. I will receive a full description of the findings of the study as soon as it becomes available.
3. My participation is completely voluntary and I may withdraw from the study at any time.

Date: \_\_\_\_\_ Signature: \_\_\_\_\_

Name: \_\_\_\_\_ Age: \_\_\_\_\_

Address: \_\_\_\_\_

Number and Street

Apt. No.

City

Province

Postal Code: \_\_\_\_\_ Telephone No. \_\_\_\_\_

Subject No. \_\_\_\_\_

- \_\_\_ Health Questionnaire
- \_\_\_ Activities
- \_\_\_ Life Events
- \_\_\_ Old Interview

Code No. \_\_\_\_\_

### I. Update Interview

I'd like you to tell me about what's been happening to you since I saw you last (the last interview). I'm interested particularly in any changes that have occurred in your life since our last visit.

	General	OUTS	EXTS
1. How have you been?			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
_____			
3. (Pull health questionnaire) Last time we talked, you indicated that you had these health problems. (Briefly list some checked items). Have there been any changes?			
_____			
_____			
_____			

4. I'm also interested in what kind of activities you've been doing.

	OUTS	EXTS
_____	_____	_____
_____		
_____		

5. Last time you indicated that you were involved in these activities. (Again, list some items from old activity measure). Have there been any changes?

_____	_____	_____
_____		
_____		
_____		

6. And now I'm interested in the things that have happened to you.

_____	_____	_____
_____		
_____		
_____		

7. Last time you told me that the following important or major events had happened during the last year (briefly list from old events scale). Has any other major events occurred? How did it affect your?

_____	_____	_____
_____		
_____		
_____		
_____		
_____		



## II. Finances

8. Have there been any changes in your financial situation since I last saw you?

	OUTS	EXTS
_____	_____	_____
_____		
_____		
_____		

9. Would you say that you are (or are not) as financially comfortable as you had said you were last time?

_____	_____	_____
_____		
_____		

## III. Family

Now, I'd like to know what changes have occurred in your family life.

10. Are you still (married, single, etc.?)

_____	_____	_____
_____		

If no, change, go to family contact items starting with number 6. If a change has occurred, specify the change.

11. When did the change occur?

_____	_____	_____
_____		

12. If widowed, when did your husband/wife die?

_____	_____	_____
_____		

13. What did he/she die of?

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14. How have you been coping with this?

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15. Are there any changes in where your children live?

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16. Are there any changes in how often you see your children socially? (For each child, indicated whether he/she see the child, daily, weekly, monthly, etc.)

Person

Type of Contact

Frequencies

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17. How about grandchildren? Do you have any

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18. How many do you have?

_____	_____	_____
_____		
_____		

19. How often do you see them?

Sex of grand child      Type of Contact      Frequency

_____	_____	_____
_____		
_____		
_____		

20 .Are there any changes in how often you see other members of your family that you see socially? Sisters, brothers, cousins? For each person named, indicate the amount of time as above.

Person      Type of Contact      Frequency

_____	_____	_____
_____		
_____		
_____		

#### IV. Residence

21. (If tested in lab, ask, "Have you moved or are you still living in the same place?"). If at home, say, "I see you have moved" and ask the following questions. (If they haven't moved, skip these items).
22. How many rooms do you have in your house (apartment)? Count each room including the kitchen (but not the bathrooms).

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23. Would you say your home is too small, too large, or just about right for your needs?
1. Too large
  2. Too small
  3. Just about right
  4. N.A.

24. How many people live with you at home?

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25. What is the location of your home? (Name of location).

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26. Would you say that (name of area) is part of a:

- |               |                     |
|---------------|---------------------|
| 1. Large City | 27. Downtown suburb |
| 2. Small City |                     |
| 3. Town       |                     |
| 4. Country    |                     |

V. Miscellaneous

28. Is English/French (language in which interview is conducted) your native language? (If answer is yes, skip #19).

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29. If English/French is not your native language, how comfortable are you with it?

- 1) very uncomfortable
- 2) not comfortable
- 3) somewhat comfortable
- 4) comfortable
- 5) very comfortable

30. Do you speak any other languages? If so, which ones?

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31. Which hand is dominant?

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## DRINKING HISTORY

Now I would like to ask you some questions about your alcohol consumption.

1. What was the approximate date of your last drink of beer, wine or liquor?

\_\_\_\_\_/\_\_\_\_\_  
MONTH YEAR

**IF SUBJECT NEVER DRANK, CODE 0 IN YEAR, STOP AT THIS POINT, GO ON TO MAKE A GRAPH. THEN SKIP THE CAUS AND THE MAST.**

Now let's talk about the 30 days before your last drink, including that day. That would be from \_\_\_\_\_ to \_\_\_\_\_.

2. About how many days altogether did you drink beer, wine, or liquor during that 30-day period?

NUMBER OF DAYS \_\_\_\_\_  
(30 days maximum)

The next several questions are about that same 30-day period before your last drink, that is, the period from \_\_\_\_\_ to \_\_\_\_\_.

3. During that 30-day period, how many days did you drink beer?

\*\*\* NUMBER OF DAYS \_\_\_\_\_  
(IF 0, SKIP TO QUESTION 5.)

4. On a typical day when you drank beer, how much beer did you drink (record number of drinks and quantity per drink)?

# of beers (per day) \_\_\_\_\_ # of oz. per beer \_\_\_\_\_

(Hint: regular beer can/bottle = 12 oz.; large size = 16 oz.)

\*\*\* **QUANBEER** = # of beers (per day) X # of oz. per beer  
= \_\_\_\_\_

5. During the 30-day period, on how many days did you drink wine?

\*\*\* NUMBER OF DAYS \_\_\_\_\_

(IF 0, SKIP TO QUESTION 7.)

6. On a typical day when you drank wine, how much wine did you drink?

# of servings of wine (per day) \_\_\_\_\_ # oz. per wine serving \_\_\_\_\_

(Hint: standard wine glass = 5 oz.)

half-bottle = 12.5 oz

bottle = 25 oz.

Litres = 35 oz.)

\*\*\***QUANWINE** = # of servings of wine (per day) X # oz. per wine serving  
= \_\_\_\_\_

Was the wine that you drank table wine or fortified wine such as sherry or  
vermouth or both? % table \_\_\_\_\_ % fortified \_\_\_\_\_

7. During that 30-day period, on how many days did you drink hard liquor,  
such as whiskey, vodka, gin, cognac, or liqueur?

\*\*\*NUMBER OF DAYS \_\_\_\_\_

(IF 0, SKIP TO QUESTION 10.)

8. On a typical day when you drank hard liquor, how much liquor did you drink?

# of servings of liquor (per day) \_\_\_\_\_ # oz. Per liquor serving \_\_\_\_\_

(Hint: pint = 16 oz.

fifth = 26 oz.

quart = 32 oz.

jigger or finger = 1.5 oz.

shot = 1 oz.)

\*\*\***QUANHARD** = # of servings of liquor (per day) X # oz. per liquor serving  
= \_\_\_\_\_

9. Some people drink the same amount on a regular basis, but once in a while, they drink a lot more than regular. Out of \_\_\_\_\_ days in which you said that you drink, on how many did you drink more than you regularly do? \_\_\_\_ What was the maximum number of drinks that you drink on any one of those days?

NUMBER OF DRINKS:

# beer \_\_\_\_\_ X # oz. Per serving \_\_\_\_\_ = \_\_\_\_\_/12 = MAXBEER \_\_\_\_\_  
 # wine \_\_\_\_\_ X # oz. Per serving \_\_\_\_\_ = \_\_\_\_\_/5 or 3 = MAXWINE \_\_\_\_\_  
 # hard \_\_\_\_\_ X # oz. Per serving \_\_\_\_\_ = \_\_\_\_\_/1.5= MAXHARD \_\_\_\_\_  
 TOTAL \_\_\_\_\_

10. What percentage of time would you drink alone, and what percentage would you drink with a least one other person?

ALONE \_\_\_\_\_% WITH OTHERS \_\_\_\_\_%

11. During what time of day would you do most of your drinking? Could you give me the percentage of time during the morning, afternoon and evening?

MORNING \_\_\_\_\_% AFTERNOON \_\_\_\_\_% EVENING \_\_\_\_\_%

12. Some people do most of their drinking on the weekend, while other people drink about the same amount during the week as they do on the weekend? Is your drinking confined mainly to the weekend or is it evenly spaced across the week? Weekend \_\_\_\_\_ Evenly spaced \_\_\_\_\_

13. Some people have a drinking style which is considered "binge drinking".

Would you consider yourself a binge drinker? Yes \_\_\_\_\_ No \_\_\_\_\_  
 For how many days does your typical binge last? \_\_\_\_\_

If no:

Have you ever been a binge drinker? Yes \_\_\_\_\_ No \_\_\_\_\_  
 For how many days did your typical binge last? \_\_\_\_\_



14. We have been talking about the 30-day period before your last drink. If you think back to the year before that drink and compare that last year to the 30-day period, do you note any differences in your drinking behavior?

**RECORD DIFFERENCES NOTED**

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15. Now I want you to think back to when you took your first drink. Do you remember the circumstances when you took your first drink?
- 

16. How old were you then?                      AGE: \_\_\_\_\_ years old.

17. What did you drink? \_\_\_\_\_ How much did you drink? \_\_\_\_\_

18. If we say that drinking regularly is to have some form of alcohol at least once a month, can you remember when you first started drinking regularly

AGE \_\_\_\_\_ years old.                      (DON'T REMEMBER \_\_\_\_\_)  
YEAR \_\_\_\_\_ (for graph)

19. When you started drinking regularly, what did you usually drink?

**PUT AN X BELOW.**

Did you drink only that, or did you drink other things as well?

- (1) BEER \_\_\_\_\_
- (2) WINE \_\_\_\_\_
- (3) LIQUOR \_\_\_\_\_
- (4) SHERRY \_\_\_\_\_
- (5) OTHER \_\_\_\_\_

20. Did you usually drink alone? \_\_\_\_\_ or with others? \_\_\_\_\_  
On social occasions? \_\_\_\_\_ What type of occasions? \_\_\_\_\_

21. During the first year that you drank regularly, how much would you say  
you drank? **USE THE 8-POINT RATING SCALE.**

RATING \_\_\_\_\_

22. During what time of day would you do most of your drinking? Could you  
give me the percentage of time during the morning, afternoon and  
evening?

MORNING \_\_\_\_\_% AFTERNOON \_\_\_\_\_% EVENING \_\_\_\_\_%

**DO NOT FORGET THE CALCULATION:**

Tester: Take a moment to make calculations before doing the graph.

One standard drink = 12 oz.	Beer
1.5 oz	liquor
5 oz	wine
3 oz	fortified wine

1 l = 35 oz  
1oz = 30 ml  
1 pint = 16 oz

1 bottle wine = 750 ml = 25 oz  
1/2 bottle wine = 375 ml = 12.5 oz  
1 quart = 32 oz = .946l

\*\*\*\*\*

$$\text{BEERDAYS (\#3)} \text{ \_\_\_\_\_\_ } \times \text{QUANBEER (\#4)} \text{ \_\_\_\_\_\_ } = \text{QBEER} \text{ \_\_\_\_\_\_ } / 12 = \text{QTBEER} \text{ \_\_\_\_\_\_ }$$

$$\text{WINEDAYS (\#5)} \text{ \_\_\_\_\_\_ } \times \text{QUANWINE (\#6)} \text{ \_\_\_\_\_\_ } = \text{QWINE} \text{ \_\_\_\_\_\_ } / 5 \text{ OR } 3(*) = \text{QTWINE} \text{ \_\_\_\_\_\_ }$$

$$\text{HARDDAYS (\#7)} \text{ \_\_\_\_\_\_ } \times \text{QUANHARD (\#8)} \text{ \_\_\_\_\_\_ } = \text{QHARD} \text{ \_\_\_\_\_\_ } \times 1.5 = \text{QTHARD} \text{ \_\_\_\_\_\_ }$$

$\text{QTBEER} + \text{QTWINE} = \text{QTHARD}$	$\text{ \_\_\_\_\_\_ } + \text{ \_\_\_\_\_\_ } = \text{ \_\_\_\_\_\_ }$	<b>TOTAL DRINKS PER WEEK</b>
4.3	4.3	

FOR GRAPH

(\*) = divide by 5 for table wine or 3 for fortified wine.

**AT THIS POINT PUT THE QUAD SHEET IN FRONT OF THE SUBJECT AND CONTINUE AS FOLLOWS:**

We are now going to try to draw picture of your drinking on this graph paper. Along the bottom line, you see that a number of years have been entered. Along the side we have entered the categories from the eight-point scale. Let us enter at this point the amount that you drank in that 30-day period before you took your last drink (the above calculation). **(MARK IT ON THE GRAPH WITH A "X". IF THE SUBJECT SPONTANEOUSLY DISAGREES WITH THE POSITION MARKED, ENTER HIS OR HER REVISED POSITION WITH A CIRCLE AND USE THE CIRCLE FOR THE REST OF THIS TEST).** You told me that in the year prior to the 30-day period you drank (MORE, LESS, or THE SAME) (see #14) as you did in that period; so we would put an X here and draw the line in this direction.

Now let us mark in the amount that you drank in the first year at his point in relation to the other s (see #21).

And now let us work on how your drinking changed between the first year and the most recent period. **IF S DOES NOT REMEMBER, PROVIDE TIME MARKERS, BY SAYING:** In order to remember how your drinking pattern may have changed over the years, it can be helpful to think of major events and to see how your drinking patterns may have changed in the time surrounding that life event. These events can be personally significant, such as a marriage or career beginning or of major world importance such as the Second World War. So why don't you begin by telling me of an important event, and we will figure out the approximate date to help us fill in the picture.

**RECORD EVENTS DIRECTLY ON THE GRAPH**

**\* AS YOU WORK, MAKE SURE THAT THE S APPROVES OF WHAT YOU ARE DRAWING AND AFTER THE GRAPH HAS BEEN DRAWN CHECK THAT THE S FEELS THAT IT IS AS ACCURATE A REFLECTION OF HIS DRINKING AS POSSIBLE. MAKE WHATEVER CORRECTIONS OR ADJUSTMENTS THAT THE S SUGGESTS.**

**USE AN "X" TO REPRESENT A FIRST JUDGEMENT; USE AN "O" TO REPRESENT A CORRECTION OR ADJUSTMENT.**

**MAST****INSTRUCTIONS:**

This questionnaire related to drinking behaviour. Please read each statement carefully and indicate your response by checking the box below YES or NO. Make sure you answer all the questions.

<b>YES</b>	<b>NO</b>	
___	___	1. Do you feel you are a normal drinker?
___	___	2. Have you ever awakened in the morning after some drinking the night before and found that you could not remember a part of the evening before?
___	___	3. Does your spouse or someone close to you ever worry or complain about your drinking?
___	___	4. Can you stop drinking without a struggle after one or two drinks?
___	___	5. Do you ever feel bad about your drinking?
___	___	6. Do friends or relatives think you are a normal drinker?
___	___	7. Are you always able to stop drinking when you want to?
___	___	8. Have you ever attended a meeting of Alcoholics Anonymous (AA) because of your drinking?
___	___	9. Have you gotten into fights when drinking?
___	___	10. Has drinking ever created problems with you and your spouse?
___	___	11. Has your spouse (or other family member) ever gone for help about your drinking?
___	___	12. Have you ever lost friends because of drinking?

YES

NO

\_\_\_

\_\_\_

13. Have you ever gotten into trouble at work because of drinking?

\_\_\_

\_\_\_

14. Have you ever lost a job because of drinking?

\_\_\_

\_\_\_

15. Have you ever neglected your obligations, your family, or your work for two or more days in a row because of drinking?

\_\_\_

\_\_\_

16. Do you ever drink before noon?

\_\_\_

\_\_\_

17. Have you ever been told you have liver trouble? Cirrhosis?

\_\_\_

\_\_\_

18. Have you ever had Delirium Tremens (DTS) , severe shaking, heard voices or seen things that weren't there after heavy drinking?

\_\_\_

\_\_\_

19. Have you ever gone to anyone for help about your drinking?

\_\_\_

\_\_\_

20. Have you ever been in a hospital because of drinking?

\_\_\_

\_\_\_

21. Have you ever been a patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was part of the problem?

\_\_\_

\_\_\_

22. Have you ever been seen at a psychiatric or mental health clinic, or gone to a doctor, social worker or clergyman for help with an emotional problem in which drinking had played a part?

\_\_\_

\_\_\_

23. Have you ever been arrested, even for a few hours, because of drunk behavior?

\_\_\_

\_\_\_

24. Have you ever been arrested for drunk driving after drinking?

Code No. \_\_\_\_\_

### MUNSH

We would like to ask you some questions about how things have been going. Please answer "Yes" if a statement is true for you and "No" if it does not apply to you.

In the past 12 months have you been feeling:

	Yes	No
1. On top of the world?	_____	_____
2. In high spirits?	_____	_____
3. Particularly content with your life?	_____	_____
4. Lucky?	_____	_____
5. Bored?	_____	_____
6. Very lonely or remote from other people?	_____	_____
7. Depressed or very unhappy?	_____	_____
8. Flustered because you didn't know what was expected of you?	_____	_____
9. Bitter about the way your life has turned out?	_____	_____
10. Generally satisfied with the way your life has turned out?	_____	_____

**The next 14 questions have to do with more general life experience. (Last ten years).**

11. This is the dreariest time of my life.	_____	_____
12. I am just as happy as when I was younger.	_____	_____
13. Most of the things I do are boring or monotonous	_____	_____

	Yes	No
14. The things I do are as interesting to me as they ever were.	_____	_____
15. As I look back on my life, I am fairly well satisfied.	_____	_____
16. Things are getting worse as I get older.	_____	_____
17. Do you feel lonely?	_____	_____
18. Little things bother me more this year.	_____	_____
19. I live where I want to live.	_____	_____
20. I sometimes feel that life isn't worth living.	_____	_____
21. I am as happy now as I was when I was younger	_____	_____
22. Life is hard for me most of the time	_____	_____
23. Are you satisfied with your life today?	_____	_____
24. My health is the same or better than most people my age	_____	_____



**EYSENCK**

Here are some questions regarding the way you behave, feel and act. After each question, there is a space for answering "Yes" or "No".

Try and decided whether "Yes" or "No" represents your usual way of acting or feeling. Then check off the box under the column headed "Yes" or "No".

Work quickly and don't spend too much time over any question; we want your first reaction, not a long drawn-out thought process. The whole questionnaire shouldn't take more than a few minutes. Be sure not to omit any questions. Now turn the page over and go ahead. Work quickly and remember to answer every question. There are no right or wrong answers, and this is not a test of intelligence or ability, but simply a measure of how you behave.

E ( )          N ( )          L ( )

**FORM A**

	Yes	No
1. Do you often long for excitement?	( )	( )
2. Do you often need understanding friends to cheer you up?	( )	( )
3. Are you usually carefree?	( )	( )
4. Do you find it very hard to take no for an answer	( )	( )
5. Do you stop and think things over before doing any thing?	( )	( )
6. If you say you will do something do you always keep your promise, no matter how inconvenient it might be to do so?	( )	( )
7. Does your mood often go up and down?	( )	( )
8. Do you generally do and say things quickly without stopping to think/	( )	( )

		Yes	No
9.	Do you ever feel "just miserable" for no good reason	( )	( )
10.	Would you do almost anything for a dare?	( )	( )
11.	Do you suddenly feel shy when you want to talk to an attractive stranger?	( )	( )
12.	Once in a while do you lose your temper and get angry?	( )	( )
13.	Do you often do things on the spur of the moment?	( )	( )
14.	Do you often worry about things you should not have done or said?	( )	( )
15.	Generally do you prefer reading to meeting people?	( )	( )
16.	Are your feelings rather easily hurt?	( )	( )
17.	Do you like going out a lot?	( )	( )
18.	Do you occasionally have thoughts and ideas that you would not like other people to know about?	( )	( )
19.	Are you sometimes bubbling over with energy and sometimes very sluggish?	( )	( )
20.	Do you prefer to have few but special friends?	( )	( )
21.	Do you daydream a lot?	( )	( )
22.	When people shout at you, do you shout back?	( )	( )
23.	Are you often troubled about feelings of guilt?	( )	( )
24.	Are all your habits good and desirable ones?	( )	( )
25.	Can you usually let yourself go and enjoy yourself a lot at a lively party?	( )	( )
26.	Would you call yourself tense or "highly strung"?	( )	( )
27.	Do other people think of you as being very lively?	( )	( )

	Yes	No
28. After you have done something important, do you often come away feeling you could have done better?	( )	( )
29. Are you mostly quiet when you are with other people?	( )	( )
30. Do you sometimes gossip?	( )	( )
31. Do ideas run through your head so that you cannot sleep?	( )	( )
32. If there is something you want to know about, would you rather look it up in a book than talk to someone about it?	( )	( )
33. Do you get palpitations or thumping in your heart?	( )	( )
34. Do you like the kind of work that you need to pay close attention to?	( )	( )
35. Do you get attacks of shaking or trembling?	( )	( )
36. Would you always declare everything at the customs, even if you knew that you could never be found out?	( )	( )
37. Do you hate being with a crowd who play jokes on one another?	( )	( )
38. Are you an irritable person?	( )	( )
39. Do you like doing things in which you have to act quickly?	( )	( )
40. Do you worry about awful things that might happen?	( )	( )
41. Are you slow and unhurried in the way you move?	( )	( )
42. Have you ever been late for an appointment or work?	( )	( )
43. Do you have any nightmares?	( )	( )
44. Do you like talking to people so much that you would never miss a chance of talking to a stranger?	( )	( )

		Yes	No
45.	Are you troubled by aches and pains?	( )	( )
46.	Would you be very unhappy if you could not see lots of people most of the time?	( )	( )
47.	Would you call yourself a nervous person?	( )	( )
48.	Of all the people you know are there some whom you definitely do not like?	( )	( )
49.	Would you say you were fairly self-confident?	( )	( )
50.	Are you easily hurt when people find fault with you or your work?	( )	( )
51.	Do you find it hard to really enjoy yourself at a lively party?	( )	( )
52.	Are you troubled with feelings of inferiority?	( )	( )
53.	Can you easily get some life into a rather dull party?	( )	( )
54.	Do you sometimes talk about things you know nothing about?	( )	( )
55.	Do you worry about your health?	( )	( )
56.	Do you like playing pranks on others?	( )	( )
57.	Do you suffer from sleeplessness?	( )	( )

**GENERAL BELIEF SURVEY 1:**

The purpose of this questionnaire is to determine your attitudes and beliefs on a variety of matters pertaining to everyday living. There are two parts to this questionnaire. The first part asks you to rate how desirable different events are to you. The second part asks you to rate the degree to which you agree or disagree with various statements.

**Part I: Desire of Outcomes**

There are many activities or events which happen to ourselves in everyday living. Some of these events are more important or desirable to you than others. Listed below are statements mentioning some of these activities or events. Would you please rate the extent to which each event described is important or not to you. We emphasize that we are concerned here with the importance to you, not to others.

Use the following code to answer:

	1 Very Desirable	2 Desirable	3 Undecided	4 Undesirable	5 Very Undesirable		
1. How important is it to you that you maintain your health?			1	2	3	4	5
2. How important is being able to spend your time doing whatever you wish?			1	2	3	4	5
3. How important is it that you do the chores yourself without any help?			1	2	3	4	5
4. How desirable is it to you that you can be active whenever you wish?			1	2	3	4	5
5. How desirable to you is it to be able to help others?			1	2	3	4	5
6. How important is it to you that you can have your friends over whenever you want?			1	2	3	4	5

**PART II:                    Beliefs and Attitudes**

The following are statements which may described either yourself or the beliefs you have. Would you please respond to each statement using the scale indicating the degree to which you agree or disagree in you own opinion, not your judgement of what others think. From time to time you may find that some items seem to be repeated. Don't worry about this, for each item is purposefully different in terms of its specifics wording. Would you please go ahead and rate your degree of agreement or disagreement to each statement.

	1 Strongly Agree	2 Agree	3 Undecided	4 Disagree	5 Strongly Disagree		
1. People tend to ignore my advice and suggestions.			1	2	3	4	5
2. Maintaining my level of health strongly depends on my own efforts.			1	2	3	4	5
3. It is difficult for me to get to know people.			1	2	3	4	5
4. I can usually arrange to go on outings that I am interested in.			1	2	3	4	5
5. The situation I live in prevents me from contacting my family as much as I wish.			1	2	3	4	5
6. I spend my time usually doing what I want.			1	2	3	4	5
7. Although it is sometimes strenuous, I try to do the chores by myself.			1	2	3	4	5
8. I find that if I ask my friends or family to visit me, they come.			1	2	3	4	5
9. I have quite a bit of influence on the degree to which I can be involved in activities			1	2	3	4	5

	1 Strongly Agree	2 Agree	3 Undecided	4 Disagree	5 Strongly Disagree		
10. I can rarely find people who will listen closely to me.			1	2	3	4	5
11. My getting away from the house (home) generally depends on someone else making the decisions.			1	2	3	4	5
12. Visits from my family (or friends) seem to be due to their own decisions, and not my influence.			1	2	3	4	5
13. People generally do not allow me to help them.			1	2	3	4	5
14. I can entertain friends when I want.			1	2	3	4	5
15. Keeping in contact with interesting ideas is easy for me to do.			1	2	3	4	5
16. I am able to find privacy when I want it.			1	2	3	4	5

**SOCIAL SUPPORT QUESTIONNAIRE****INSTRUCTIONS:**

The following questions ask about people in your environment who provide you with help or support. Each question has two parts:

For the first part, list all the people you know, excluding yourself, whom you can count on for help or support in the manner described. Give the person's initials and their relationship to you. Do not list more than one person next to each of the letters beneath the question.

For the second part, circle how satisfied you are with the overall support you have.

If you have no support for a question, circle the words "No one", but still rate your level of satisfaction.

Do not list more than nine persons per question. Please answer all questions as best you can. All your responses will be kept confidential.

**EXAMPLE:**

Who do you know whom you trust with information that could get you in trouble?

No one ( )	1) T.N. (Brother)	4) S.N. (Father)	7)
	2) L.M. (Friend)	5) P.S. (Employer)	8)
	3) R.S. (Friend)	6)	9)

How satisfied?

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**1. Whom can you really count on to listen to you when you need to talk?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)



**2. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**3. Whose lives do you feel that you are an important part of?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**4. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**5. Whom could you really count on to help you out in a crisis situation, even though they would have to go out of their way to do so?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**6. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**7. Whom can you talk with frankly, without having to watch what you say?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**8. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**9. Whom can you really count on to be dependable when you need help?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**10. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**11. Whom can you really count on to give you useful suggestions that help you avoid making mistakes?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**12. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**13. Who will comfort you when you need it by holding you in their arms?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**14. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

**15. Whom do you feel would help if a family member very close to you died?**

No one ( )	1)	4)	7)
	2)	5)	8)
	3)	6)	9)

**16. How satisfied?**

very satisfied	fairly satisfied	a little satisfied	a little dissatisfied	fairly dissatisfied	very dissatisfied
6	5	4	3	2	1

ACTIVITIES

Here is a list of activities that some people do. Please read over this list and check each activity that you engage in or do and if so, how often.

<u>Activity</u>	<u>Frequency</u>				
	Less than once a year	1-11 times a year	1-3 times a month	1-6 times a week	daily
1. Socializing (not with family)	_____	_____	_____	_____	_____
2. Visiting with family members	_____	_____	_____	_____	_____
3. Gardening	_____	_____	_____	_____	_____
4. Reading	_____	_____	_____	_____	_____
5. T.V./Radio	_____	_____	_____	_____	_____
6. Sit & Think	_____	_____	_____	_____	_____
7. Caring for younger/older family members	_____	_____	_____	_____	_____
8. Arts/Crafts/Hobbies	_____	_____	_____	_____	_____
9. Walking	_____	_____	_____	_____	_____
10. Fraternal/Community Organization/Clubs Activities	_____	_____	_____	_____	_____
11. Housework	_____	_____	_____	_____	_____
12. Meditation/Worship	_____	_____	_____	_____	_____

<u>Activity</u>	<u>Frequency</u>				
	Less than once a year	1-11 times a year	1-3 times a month	1-6 times a week	daily
13. Personal Care	_____	_____	_____	_____	_____
14. Napping	_____	_____	_____	_____	_____
15. Shopping	_____	_____	_____	_____	_____
16. Cards/Games	_____	_____	_____	_____	_____
17. Volunteer Work	_____	_____	_____	_____	_____
18. Writing	_____	_____	_____	_____	_____
19. Working Part-time/ Full-time	_____	_____	_____	_____	_____
20. Sports	_____	_____	_____	_____	_____
21. Political Activities	_____	_____	_____	_____	_____
22. Theatre, Cinema	_____	_____	_____	_____	_____
23. Other	_____	_____	_____	_____	_____

### SERIOUSNESS OF ILLNESS RATING SCALE

**Instructions:** Please check those symptoms or diseases you have experienced in the past 5 years.

Item Number	Disease Items	
1.	Headache	_____
2.	Dizziness	_____
3.	Varicose veins	_____
4.	Haemorrhoids	_____
5.	Low blood pressure	_____
6.	Drug allergy	_____
7.	Bronchitis	_____
8.	Hyperventilation	_____
9.	Bursitis	_____
10.	Lumbago	_____
11.	Migraine	_____
12.	Hernia	_____
13.	Irregular heart beat	_____
14.	Overweight	_____
15.	Anemia	_____
16.	Anxiety reaction	_____
17.	Gout	_____
18.	Pneumonia	_____
19.	Depression	_____
20.	Kidney infection	_____
21.	Inability for sexual intercourse	_____
22.	Hyperthyroid/Hypothyroid	_____
23.	Asthma	_____
24.	Glaucoma	_____
25.	Gallstones	_____
26.	Arthritis	_____
27.	Slipped disk	_____
28.	Hepatitis	_____
29.	Kidney stones	_____
30.	Peptic ulcer	_____

Item Number	Disease Items	
31.	Pancreatitis	_____
32.	Deafness	_____
33.	Collapsed lung	_____
34.	High blood pressure	_____
35.	Epilepsy	_____
36.	Chest pain	_____
37.	Nervous breakdown	_____
38.	Diabetes	_____
39.	Blood clot in blood vessels	_____
40.	Hardening of the arteries	_____
41.	Emphysema	_____
42.	Tuberculosis	_____
43.	Alcoholism	_____
44.	Drug addiction	_____
45.	Cirrhosis of the liver	_____
46.	Parkinson's disease	_____
47.	Blindness	_____
48.	Stroke	_____
49.	Bowel problems	_____
50.	Heart failure	_____
51.	Heart attack	_____
52.	Brain infection	_____
53.	Multiple sclerosis	_____
54.	Uremia	_____
55.	Cancer	_____
56.	Leukemia	_____
57.	Cataracts	_____
58.	Prostectomy	_____
59.	Difficulty in focussing vision	_____
60.	Rheumatism	_____
61.	Other (specify)	_____
62.	Are you on any medications regularly?	_____

**Names of Current Meds**

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**Purpose of Meds**

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