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Stressful life events and increases in alcohol consumption among male problem drinkers.

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*STRESSFUL LIFE EVENTS AND
INCREASES IN ALCOHOL CONSUMPTION
AMONG MALE PROBLEM DRINKERS*

A Dissertation Presented

By

RICHARD LAWRENCE LEAVY

*Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of*

DOCTOR OF PHILOSOPHY

August 1976

Psychology

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ACKNOWLEDGMENTS

I have found that doing a dissertation is, itself, a stressful life event. That I have not become a heavy drinker in response to it I attribute to several people who deserve my thanks. First, to my committee, Dee Appley, Howard Gadlin, Peter Park, and especially my chairman, Dave Todd, I owe a debt of gratitude. You have supported me and my interest in a fascinating but difficult topic and so you have taught me diligence tempered with flexibility. My sincere thanks go to William P. Rohan and Henry S. G. Cutter who helped me gain access to subjects, and to Barbara Michalik and Sharon O'Leary who assisted in interviewing. I am also grateful to Rosalie Grueninger who typed the manuscript with speed and care.

My strongest feelings of appreciation are for three very important people in my life. My parents, Sidney and Diana, have nurtured my curiosity, supported my ambition, and shown me how to cope with stress and challenge through their example of love. But most of all, this work is dedicated to Chris, my fiancée, best friend, and staunch ally. Her concern, intelligence, care, and sensitivity have enabled me to finish this project with a hearty measure of satisfaction and some measure, at least, of mental health.

R.L.L.

ABSTRACT

*Stressful Life Events and
Increases in Alcohol Consumption
Among Male Problem Drinkers*

(August, 1976)

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A study was undertaken at two Veterans Administration hospital alcohol treatment units to explore the relationship between stressful life experiences and alcohol consumption. Twenty-eight male problem drinkers gave longitudinal self-report data on the amount of alcohol consumed and the major life events they experienced as adults. Life stress was assessed with a life event inventory based on the Schedule of Recent Experience (Holmes & Rahe, 1967). Consumption data were collected in a second structured interview.

Amount of life stress and amount of alcohol consumed correlated significantly. Events which had high probabilities of association with drinking increases were highly stressful, unexpected, or events in which an important person exited from the social field. No demographic factors differentiated stress-respondent drinkers from non-stress-respondent drinkers.

A model was proposed to conceptualize stress and drinking as a systemic interrelationship influenced by both personality and situational factors. Directions for future theory, research, and clinical practice were offered.

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C H A P T E R I

INTRODUCTION

This study aims to investigate the relationship between the alcohol consumption of problem drinkers and the experience of life stress. A wide range of formal theories exists to account for the onset of excessive drinking---genetic, hormonal, psychoanalytic, sociocultural formulations.¹ Among the many factors ascribed to the etiology of alcohol problems, laymen and professionals often nominate tension or stress (Verden, Jackson, & King, 1969). Stress is an important variable in several etiological models, primarily the reinforcement (Conger, 1956) and social learning (Bandura, 1969) viewpoints. These learning-based models underlie a host of therapeutic techniques for treating problem drinkers (Hamburg, 1975). Yet little direct evidence is available for linking the onset of heavy drinking with the experience of stressful life events. This is a considerable lacuna in our understanding of the situational factors which are associated with the onset of drinking problems. The present work intends to examine the interrelationships of stress and alcohol consumption among problem drinkers. Further, it hopes to begin a process of identifying stress-respondent problem drinkers and the stressful situations which are most likely to precipitate heavy drinking.

¹Two sources can inform the reader of the scope and nature of these etiological theories. Seigler, Osmond, & Newell (1968) present a general overview of professional and lay conceptualizations of alcohol problems. For a more in-depth examination of research and theory into the etiology of problem drinking, consult Roebuck and Kessler's The etiology of alcoholism (1972).

As an introduction to the present investigation, one needs to trace the research pointing to a connection between stressful events and increases in alcohol intake. Since both the stress and alcohol literatures are large ones, only a selective review is presented here with a focus on work which examines the effects of life stress and the tension-reducing aspects of alcohol. Following this brief overview is a somewhat more detailed look at those few studies which highlight the interface of stress and alcohol problems.

Literature Review

Life events. Although the influence of life events such as marriage, financial difficulties, and the death of loved ones, has been of interest to social scientists for decades, research has only recently begun to identify the exact nature of stressful life change and its effects on physical and mental health (Dohrenwend & Dohrenwend, 1974). Most research has been devoted to understanding the relationship between life crisis and disease onset. Through a series of investigations (e.g., Rahe, Mahan, & Arthur, 1970; Coddington, 1972; Holmes & Masuda, 1974; Theorell, 1974) the occurrence of major life events such as marriage, divorce, and the death of close relatives has been strongly and consistently related to the onset of a variety of diseases including heart attack, ulcerative colitis, pneumonia, and childhood illnesses. These clinical findings underscore Selye's (1956) theories of stress and disease. The larger the number of events occurring in a cluster and the more stressful the events, the greater the likelihood of illness onset

and the severity of symptoms (Rahe, Mahan, & Arthur, 1970).

Holmes and Rahe (1967) are responsible for designing much of the experimental methodology used to study the stress-illness onset phenomenon. They evolved a 43-item life events questionnaire called the Schedule of Recent Experience (SRE) which covers most of the developmental or expectable stresses of living (marriage, the birth of children, etc.), as well as typical but unpredictable stresses such as work lay-offs, injuries to family members, or marital difficulties. In scaling these items for perceived stressfulness, researchers have found a consistent pattern of ordering the events according to how upsetting they are and the adjustment they demand of persons experiencing them (Masudá & Holmes, 1967; Paykel & Uhlenhuth, 1972; Lundberg, Theorell, & Lind, 1975). The highest rated SRE events are interpersonal traumas or rearrangements (e.g., death of a spouse, separation, divorce, death of a relative, marital reconciliation, and marriage) or financial and social disruptions (e.g., imprisonment, fired or laid off at work). The occurrence of several major life changes in a limited time period often foretells the onset of serious illness.²

We may imagine that life disruptions frequently precipitate psychological difficulties in addition to physical ailments. Research evidence bears out this expectation. Myers, Lindenthal, Pepper, & Ostrander (1972) conducted a longitudinal survey study to see if increases in psy-

²A widely visible example is the case of former-President Nixon for whom the onset of acute phlebitis occurred in concurrence with the severe stresses of the Watergate probe and forced retirement.

chiatric symptomatology corresponded with times of increased life stress. Mental health impairment was found to be directly related to the number of life changes experienced. Focusing on a particular form of psychological trouble, clinical depression, Paykel, Myers, Dienelt, Klerman, Lindenthal, & Pepper (1969) and Brown, Harris, & Peto (1973) report strong relationships between the occurrence of life crises and depression.

Although there is debate on the point (Dohrenwend, 1973a), it seems that negative life events are more potent precipitators of emotional difficulties than are positive life events (Vinokur & Selzer, 1975). Paykel (1974) reports that undesirable events occur significantly more often than do desirable events. Events which precipitate depression are also more likely to involve the exit of important persons from the social field, (e.g., child leaving for college) than entrances (e.g., the birth of a child). Another crucial aspect in determining the impact of stress on psychological functioning is the context in which the life event occurs. In research on schizophrenic and depressive illness onset, Brown (1974) has found that events which occur without forewarning exact more intense adjustment than events which are expected. People caught flat-footed, as it were, by life crises tend to cope less adequately and may temporarily lose their psychological balance. These findings lend support to the cognitive theories of Janis (1958) and Lazarus (1966) that the impact of stress is most formidable when a person is unable to brace for the impending stressful time due to inadequate or incomplete pre-stress information. A high-intensity stressor such as

the death of a spouse, occurring without forewarning, can produce a nearly incapacitating impact. In a longitudinal study of bereavement, Glick, Weiss, & Parkes (1974) found that the unanticipated death of spouses occasionally interfered severely with the survivor's social and psychological well-being several years after the death. Persons with some forewarning took less time to readjust their lives.

Stress and alcohol. As noted earlier, there is a paucity of research directly bearing on the effect of life stress on alcohol consumption among problem drinkers. While concentrating on bereavement reactions, several studies offer anecdotal evidence that stress can precipitate heavy drinking. The research mentioned above (Glick, et al., 1974) notes in passing that several of the widowers interviewed who experienced the unforewarned death of their wives markedly increased their alcohol use to cope with their distress. Parkes (1965) offers more data with his analysis of 115 case histories of bereavement. Thirteen persons (sex unspecified) became alcoholic drinkers during their period of bereavement. In another bereavement study, Stein & Susser (1970) found that, of persons who were hospitalized for psychiatric problems following the death of a spouse, reactive depression and alcohol addiction were the modal diagnoses for women and men, respectively. Taken together there is evidence that many men respond to severe stress by increasing their alcohol intake.

The ability of alcohol to reduce physiological and psychological feelings of stress is theoretically central to reinforcement and social learning notions of alcoholic onset (Ullman, 1952). Bandura (1969)

specifically presents a theory of drinking behavior based on alcohol as a tension-reducing, or ataractic, drug.

The research...indicates that excessive alcohol consumption is maintained through positive reinforcement derived from the central depressant and anesthetic properties of alcohol. Persons who are repeatedly subjected to environmental stress are, consequently, more prone to consume anesthetic doses of alcohol than those who experience less stress and for whom, therefore, alcohol has only weak reinforcing value. (Bandura, 1969, p. 533)

In laboratory experiments researchers have specifically studied the interrelationship of stress and alcohol consumption. Considerable evidence now documents the tension-reduction, or ataractic, capabilities of alcohol in animals (Masserman & Yum, 1946; Casey, 1960; von Wright, Pekanmaki, & Malin, 1971). The results of experimentation with humans are less consistent. Moderate levels of drinking appear to reduce levels of emotional tension (Greenberg & Carpenter, 1957; Williams, 1966). However, Nathan and his colleagues (Nathan, O'Brien, & Norton, 1971; Allman, Taylor, & Nathan, 1972) conducted laboratory studies in which subjects engaged in prolonged heavy drinking and found the opposite effect. Alcoholics reported that feelings of depression, as measured by the Mood Adjective Checklist, significantly increased after heavy drinking. Non-alcoholics matched on a number of demographic variables showed no significant changes in affective states following periods of drinking (Nathan, O'Brien, & Norton, 1971).

Inconsistent findings in alcoholics' drinking response to stress are a reflection of the various operational definitions given the term "stress" in the laboratory setting. When the stressor is hand pain induced by ice water (Cutter, Maloof, Kurtz, & Wyatt, 1976) alcoholics

experience greater relief than non-alcoholics following drinking. Stress defined as the threat of painful or non-painful electric shock (Higgins & Marlatt, 1972) has no apparent effect on alcohol consumption. When stress involved social disapproval communicated as a threat to the subject's supply of alcohol, one of three alcoholics in a prolonged drinking study showed increased consumption during stress periods (Allman, Taylor, & Nathan, 1972). However, during stress situations of a more "real world" nature---simulated interpersonal encounters requiring assertive behavior---both alcoholics and non-alcoholics increased their drinking when under stress; the alcoholics' increases were significantly greater than the non-alcoholics' (Miller, Hersen, Eisler, & Hilsman, 1974).

Allman, et al. (1972) conclude that the effect of stress on drinking behavior may be a function of "1) whether or not the subject is a 'stress-responder' to begin with; 2) whether or not the stress is interpersonal or environmental; and, 3) whether or not it is imposed in the context of social or isolated drinking" (p. 54). McGuire, Mendelson, & Stein (1966) add another variable: the capacity of heavy drinking to induce amnesia during a drinking episode and thereby provide both cognitive and affective escape from stressful situations and uncomfortable emotional arousal. Clearly, the interrelationship is a complex one involving individual differences, situational variables, physiological-biochemical properties, and their interactions.

Still, taking what is learned in the controlled laboratory setting and applying it in clinical cases requires a large inferential leap of

faith. Laboratory definitions of stress, even role-played situations requiring assertive behaviors, may bear little resemblance to the psychic distress engendered by personally meaningful life crises. Moreover, the demand characteristics of the laboratory experiment have little similarity to the social demands associated with naturally-occurring life disruptions. An alternative to the laboratory approach of testing social learning conceptions of a stress-drinking hypothesis is to apply the life events methodology to alcoholic populations in non-laboratory settings. To date there are four studies which approximate such a method and which, thereby, directly relate to the issue of alcohol consumption and life stress.

The first study (Fort & Porterfield, 1961) was done before the SRE was devised, and so did not use what has become a standardized population of life event items. Fort and Porterfield interviewed thirty-four recovered female alcoholics who reported retrospectively when they first began to have drinking problems. Eleven of the women were assessed to have no significant pre-alcoholic maladjustments in social or psychological functioning. Of these eleven, "all but one developed their alcoholism immediately following some well-defined, highly emotional stress which they recognized as such" (p. 291). Only three of the 18 "neurotic" women showed a correlation between events and onset. Based on such small samples, these findings point to a rather powerful relationship between stress and drinking for a subsample of alcoholic women. The small sample raises another issue, however: whether these findings have generalizability or validity in other samples. The research is further

limited by its retrospective design. Fort and Porterfield did not control for what Brown, Sklair, Harris & Birley (1973) call "effort after meaning," the tendency of persons to find causes for their aberrant behavior. Much of the relationship reported by Fort and Porterfield may be due to the "neurotics" under-reporting of stresses which occurred temporally close to their radical changes in drinking behavior in an effort to defend against remembering psychically painful stimuli. In order to reduce the "effort after meaning" contamination, Fort and Porterfield would have had to use either a prospective design or an a priori inventory of life stressors.

Finally, Fort and Porterfield used Jellinek's (1946) method of defining the development of alcoholism. This method relies on the reporting of first alcoholic blackouts, job disruptions, family arguments over drinking and the like to identify the onset of problem drinking. A more behavioral index of alcohol consumption may be preferable to these subjective signs of heavy drinking which are reflections of social and psychological contexts.

Several provocative questions emerge from this study: What were the events which most commonly coincided with heavy drinking? In what context did the events occur? Were they forewarned? Besides the molar and poorly defined "neurotic vs. non-neurotic" dimension, what variables differentiate the drinker who responds to stress from the drinker who does not? Are the results of this study applicable to men as well?

To some extent, Hore (1971) has addressed these questions. Using research methods designed to combat the sources of contamination cited

by Brown (1974), Hore carried out a prospective study with a small sample of discharged alcoholics. The 22 patients studied (21 males, 1 female) returned weekly to two London hospitals on an out-patient basis and were interviewed concerning their current experience of life events and drinking. Eighteen patients gave accurate information over a 6-month follow-up period. Of the fourteen who experienced an alcoholic relapse, seven showed clear patterns of drinking concurrent with or the week after the experience of a stressful event. Disturbances of interpersonal relationships seemed to account for most of the relapses. Examples of these precipitating interpersonal stressors were "severe quarrels with wife", "meeting a new girlfriend", and "son left home for the first time." Together with the Fort and Porterfield study, it would appear that a sizeable proportion of problem drinkers substantially change their alcohol intake during stressful times.

There are two major problems with the study, however. One is the way "relapse" is defined. For the 20 patients who desired abstinence, relapse was defined as any drinking at all; for the two who sought controlled drinking, a relapse was "any increase in drinking outside their social norm" (p. 84). The latter definition is ill-defined and judgmental; the former equates a single glass of beer with a drinking binge. Secondly, Hore's work leaves unanswered the issue of which persons are most inclined to drink under stress.

The remaining two studies which highlight the stress-drinking relationship are both large-scale epidemiological surveys. Bell, Keeley, Clements, Warheit, & Holzer (1975) interviewed 122 alcohol detoxification

clients and 2,029 respondents to a community survey, and compared the two groups' experience of life events in the past year and overall psychiatric symptomatology. Detoxification patients reported almost four times more life events than the community survey respondents and significantly higher psychiatric symptom scores. Further, the detoxification patients reported significantly more events which are highly interpersonal in nature and which involve the consequences of maladaptive social behavior: e.g., jail sentences, marital separation, major financial difficulties, divorce. For events which are somewhat independent of the person's behavior (e.g., death of relatives, death of close friends, miscarriage, law suits, personal illness) there were no significant differences between groups. Bell, et al. (1975) concluded that drinking problems and life stress are iterative in nature, and suggested that stressful life experiences are directly tied to psychiatric disorder and the formation of alcoholism. The exact nature of an interrelationship remains unelaborated although the notion that drinking may be used as an attempt to cope with psychic distress (albeit a self-destructive coping strategy) comes to the fore. The last study to be discussed surveyed just this aspect of the stress-drinking relationship.

Parry, Cisin, Balter, Mellinger, & Manheimer (1974) surveyed a cross-section of American adults to assess the use of psychotropic drugs as a coping strategy. By defining "psychotropic drug" to include alcoholic beverages, Parry, et al. found that among 1,406 drinking respondents, roughly 20% (344) reported they use alcohol as a coping mech-

anism for stress. More importantly, of the heavy drinking males³ in the sample, 43% used alcohol as a coping mechanism. We might consider these men "reactive" drinkers in that they respond to stress by using alcohol. In comparing the reactive heavy drinkers with non-reactive heavy drinkers, several differentiating variables were identified. Reactive heavy drinkers were more likely to come from the western part of the United States; maintained lower socioeconomic status; and were less likely to attend church services. Parenthetically, and of interest for the present study, the Northeast U. S. provided a disproportionate share of non-reactive heavy drinkers.

Based on a modified SRE measure of stress, "reactors" experienced higher levels of life stress. Nearly half of them ranked high on a life-crisis scale compared to one-third of the non-reactive heavy drinkers. While many precipitating events were of the happenstance variety (e.g., undergoing heavy financial losses or being separated from close friends), among males, the crucial life events tended to be self-inflicted stressors (e.g., unemployment because of quitting a job or criminal behavior leading to legal troubles).

Increased alcohol consumption is just one in a repertoire of coping strategies used by reactive drinkers. They are substantially more likely than ordinary drinkers to use the alternative coping mechanisms of withdrawing from people, suffering passively, or treating themselves to new

³"Heavy" consumption was defined as 4 to 20 sittings in the past month, with 3 to 4 drinks the usual pattern; OR one to 20 sittings with 5 or more drinks the usual pattern.

clothing or an expensive dinner. Parry, et al. hypothesize that reactive drinkers "seek out a larger number of coping mechanisms, as if floundering around trying to find something that will work" (p. 17) because they experience higher levels of stress than ordinary drinkers. Thus, there is direct evidence to indicate that, for some proportion of problem drinkers, alcohol intake seems to obey the same general rules as physical illness and psychological dysfunction: the more stress the greater the chance of ineffectual coping.

Summary

Parry, et al. do not report the frequency with which various life events precipitate increases in consumption, nor do they address the issue of context and unexpectedness. There is a clear need to better illuminate the types of situations which provoke the use of alcohol as a coping strategy. If we could pinpoint the life circumstances which trigger increased consumption, we would have a useful tool in the prevention of serious drinking problems. This is not to say that isolating items from a life events inventory can effectively predict changes in problem drinking over time. Rather, a sufficient association seems to exist between changes in a person's life experience and changes in that person's drinking behavior to encourage us to widen the population of stressor items, contextual variables, and span of years over which drinking is measured to ascertain the link between stress and drinking (Cahalan, 1970).

We must also learn which persons are most susceptible to stress-responsive drinking. There is evidence from other corners of the alcohol

literature that cultural background, marital status, and age are important correlates of drinking patterns (cfs., Edwards, Chandler, Hensman, & Peto, 1972; Cahalan & Room, 1974). Furthermore, patterns of drinking and reasons for drinking increases may change over the course of adulthood (Rohan, 1974). In short, to be effective in identifying stressful situations which often increase alcohol intake, we must study, longitudinally, the person who drinks heavily to relieve stress. Thus, the present study seeks to probe in a longitudinal, individually-oriented way the territory which Parry, et al. have begun to explore in an epidemiological, single-time-period manner.

C H A P T E R I I

STATEMENT OF THE PROBLEM

Directions for the Present Work

The current study represents a departure from the mainstream of research in alcohol problems and as such deserves some special words of explanation. Research into the etiology of drinking problems has taken two main tracks --- sociological investigations which emphasize the influence of socio-cultural factors, and psychological studies which highlight the importance of personality variables. Moreover, as we have seen, most of the research on stress and drinking is not longitudinal in nature, and if longitudinal, tends to take a cross-section through a population rather than following individual subjects over many years. What is missing from our understanding of drinking behavior among problem drinkers is the interaction of situational and personal variables which affect consumption over the course of a lifetime.

The research here is guided by a desire to fill these gaps in our understanding. The direction of the research is thus longitudinal, interactional, and multicausal. First, a longitudinal assessment of alcohol consumption among male problem drinkers will be recorded through self-reports. These data on individuals will give a fuller picture of changes in drinking patterns throughout adulthood, a picture which will offer either tentative support for, or rejection of, the disease model of alcoholism.

Second, the role of life crisis in the onset and maintenance of heavy alcohol consumption will be investigated on a longitudinal basis.

Storm and Cutler (1975) have presented a thus-far uninvestigated hypothesis that alcohol consumption will vary over time in correspondence with changes in the drinker's personal resources. They predict that if a person's social status changes so that there is more time available for drinking and less for competing activities, consumption will increase. By taking a broad perspective, this study will permit the examination of highly personal, naturally-occurring stressors (many of which involve changes in social status and activities) as they relate to dramatic increases in alcohol consumption.

Third, by combining aspects of both situational variables (life events) with personal variables (demographic factors) this study explicitly examines the interface of persons in their environments. This interactionist view is supported by the evidence from personality research (Bowers, 1973; Endler, 1973; Bem & Allen, 1974) that person-situation interactions account for more of the variance of human behavior than either person or situation factors taken separately. The object of the present study is to examine a small population of persons (problem drinkers) who respond by increasing their alcohol intake when faced with a highly stressful situation (life crisis event). Such an examination may increase our ability to predict the onset of heavy drinking by taking into consideration the person, the situation, and the fit between the two.

Lastly, and perhaps most importantly, this study represents a movement away from the search for a unitary cause of alcohol problems. The diversity and richness of the alcohol literature leads to the conclusion

that the many "styles" of problem drinking are "caused" by as many or more personal, interpersonal, and environmental variables. The present research emphatically does not seek to identify a new cause for all problem drinking. Instead, this work explores a corner, a particularly interesting corner, of the discipline --- how stressful experience may or may not elicit heavy drinking. Even within this narrow range of problem drinking behavior, we can expect that consumption is multiply caused and affected by social and personal factors. Therefore, the present work examines a variety of variables purposively chosen on the basis of research evidence and current theory to have a high likelihood of relating to increases in consumption. Although he suspects these variables are crucial to our understanding of stress-respondent drinking, the author recognizes the certainty that other, unchosen factors meaningfully affect the drinking behavior of persons under stress. Knowledge of those factors awaits future research.

This brings us to the topic of what, exactly, the author expects the findings of the present study will be. Chapters entitled "Statement of the Problem" generally list the hypotheses which the researcher constructs after making a search of the literature and before designing a psychological experiment. In the present study such formalized "bets" on results seem premature. The life events and alcohol consumption literatures do not reveal clearly identified theories which can be tested with some semblance of experimental rigor. Rather than hypothesis-testing experiments, the present state of the research art requires naturalistic observation with the prospect of being surprised by unanticipated findings. The present study amounts to a naturalistic observation

using self-reports rather than more traditional observational techniques. Therefore, rather than hypotheses, this chapter lists anticipated trends and problem areas which are thought to be promising for future explorations. Some of these trends are backed by substantial previous research. They approach the level of hypotheses. Others are anticipated findings based more on educated hunches, clinical experience, and generalizations from theory and evidence in related fields.

Anticipated Trends

1. Pattern of alcohol consumption. Clinical evidence (e.g., Davies, 1962), behavior therapy outcome research (Sobell & Sobell, 1973), and non-clinical research (Rohan, 1974) indicate that "alcoholics" can acquire and sustain controlled drinking practices, often without receiving treatment specifically aimed at these behaviors. There is considerable evidence to cast doubt on the utility of a progressive disease notion of alcoholism (Jellinek, 1946; 1960) for all problem drinkers. Radical changes in drinking pattern may reflect individuals' responsiveness to specific stresses, whereas a progressive pattern would be more consistent with a disease model. Respondents in the present study will tend to show fluctuating drinking patterns, with periods of decline as well as increase and maintenance, rather than a steady progression.

2. Reported level of life stress. Parry, et al. (1974) and Bell, et al. (1975) report that problem drinkers experience a higher level of life stress than do non-problem drinker populations. Clinical experience supports this research finding as does, perhaps, common sense. Drinkers

are likely to experience more stress because some events are the consequence of drinking. For example, being fired at work or injured in a car accident are occurrences we might label "dependent" life events since their occurrence may be precipitated by heavy drinking. Other events, such as the birth of children or the death of relatives typically have little to do with drinking and are labeled "independent" life events.¹

It is anticipated that subjects in the present study will report a high degree of life stress. We can expect that a large number of "dependent" events will be reported; no prediction is made whether problem drinkers will experience a large number of "independent" events.

Since comparable non-problem drinker populations are unavailable, we cannot predict whether these subjects will experience more stress due to their drinking. However, T. S. Holmes (in Holmes & Masuda, 1974) offers data on the longitudinal life event reports of adults hospitalized for physical ailments. Some tenuous comparisons will be made with that sample; the problem drinkers are expected to report more stressful events. Specifically, problem drinkers will report a high number of marital separations, divorces, job firings, imprisonments, and general legal troubles.

One should note that these are among the more conjectural of the anticipated trends presented here.

¹A fuller listing of "dependent" and "independent" events is given in the Method section.

3. Correlation between stress and drinking. A high positive correlation is anticipated between the number of life events reported and average alcohol consumption for the group. Fort and Porterfield (1961) and Hore (1971) reported that 38% and 50% of their samples respectively showed strong relationships between stressful life changes and the onset of drinking. Yet it is unclear whether these relationships hold over the course of adulthood. In the present study, a sub-population (between one-quarter and one-third) is expected to show what can only be loosely defined as a consistent association. Maintaining a multicausal view, we cannot expect a wholly consistent pattern of stress responsivity even among persons we may call "high associators."

Correlations between alcohol consumption and "independent" life events are likely to be lower than those between consumption and "dependent" events. The degree of difference in these two measures of association will give some tentative evidence for the direction of effect --- whether stress triggers drinking or vice versa.

4. Events associated with drinking increases. Events most likely to be associated with drinking increases will be those which previous work (Myers, et al., 1972; Brown, 1974; Paykel, 1974) reports trigger psychiatric disorder. High association events will be at the upper end of the SRE (death of close relatives, divorce, separation, and imprisonment), and will be undesirable events, unexpected events, and events in which important persons exit from the social field.

Research is strong enough to give these anticipated trends the flavor of hypotheses. On less sure research footing, the author anticipates

that entrance into the military is likely to be associated with drinking increases. This is expected not so much because military induction is a stressful event (although that cannot be denied) but because it reflects a change in peer culture and a social pressure to relieve boredom or loneliness through drinking.

5. Persons likely to be "high associators". Subjects most likely to have drinking increases associated with life events will be lower in socioeconomic status than the rest of the sample.

This expectation is based on evidence that lower socioeconomic persons experience more stress (Dohrenwend, 1973b) and are more likely to consider alcohol a way of coping with stress (Parry, et al., 1974) than are middle or upper socioeconomic status persons.

No other personal demographic variables are anticipated to correlate with drinking-event associations.

C H A P T E R I I I

METHOD

Type of Study

The longitudinal, interactional, and multicausal qualities of the present study have been outlined. At this point we need to further describe the research design, its assets and limitations.

Since collecting prospective longitudinal data over many years is not within the scope of a dissertation, the author has chosen to collect retrospective data on a small sample of male problem drinkers. The current work is exploratory in nature. We do not know how drinking behavior may change in relation to stressful experiences. Neither do we know what events or aspects of the person tend to increase the chances of such a relationship. The present study's retrospective longitudinal design will provide an important initial step toward understanding how naturally-occurring stress influences or is influenced by drinking behavior.

The study should be seen as having perhaps more depth than breadth in the sense that only a narrow range of drinkers and variables were chosen to be studied. From the infinite variables one might study, a manageable few were selected on the basis of theory and research findings. The aim is that these selected variables and the design employed to examine them will help in the development of better methodologies and guide future research on other aspects of the problem.

The reader needs to be aware that this design places certain restrictions on inference and generalization. Clearly, the study's correlation-

al method precludes statements about causality. At this stage of research it is sufficient to discover an association between stress and drinking increases; the search for causal relationships seems well into the future. Neither can the reader assume that retrospective self-report data completely reflect "objective reality". Perhaps we can minimally see the data as the respondents' perception of reality, a not unimportant factor in this work. While a prospective design is obviously preferable, given its impracticality for the present topic some flawed retrospective data seem wholly justified when weighed against "pure" but unobtainable data.

Furthermore, the design does not involve comparisons of problem drinkers' behavior with non-problem drinkers' behavior. At interest are the differences in stress-respondent drinking within a problem drinker sample. One may eventually wish to know whether social drinkers change their consummative behavior when under stress, but this is not within the scope or intent of the present research.

Lastly, there are sampling limitations. Short of conducting a national probability sample survey, it is impossible to collect data which reflect all problem drinkers. The author has therefore narrowly defined the scope of sampling. (The selection criteria are described below.) What is important is that this small and narrowly defined sample restricts the generalizability of findings. Regardless of the clarity of results, this study gives no clue as to the drinking behavior of, for example, women, single men, Skid Row alcoholics, upper socioeconomic problem drinkers, or adolescent drinkers. However, it does offer insight

into the stress-drinking relationship among a population which frequently seeks in-patient treatment: middle-aged, married and divorced males.

Subjects

Selection criteria. A selection process was established to identify a subpopulation of problem drinkers which would maximize the probability that self-report data were accurate. Brain-damaged, psychotic, or otherwise grossly impaired subjects could obviously not be included. Patients with memory problems due either to deterioration caused by heavy drinking or by the time span they were required to evaluate were excluded. From previous pilot work and the report of an experienced research technician, it was decided that persons over 46 years of age were less likely to accurately report data based on memory. Subjects in the present study ranged in age from 24 to 45.

All subjects were voluntary in-patients at alcohol rehabilitation centers and had primary diagnoses of "Habitual Excessive Drinking" or "Alcohol Addiction". This insured that the respondents were, in fact, problem drinkers at least in their own eyes.

Many of the most stressful life events involve marital life--marriage, the birth of children, separation, divorce. In order to study the effects of marriage and marital stress on alcohol consumption, all selected subjects were married or once-married. This also provided the opportunity to examine the drinking response of all subjects to a "control" event: marriage.

The last selection criterion involved the sex of subjects. Male problem drinkers tend to differ from female problem drinkers in their

typical drinking pattern and problem etiology (e.g., Fort and Porterfield, 1961). Males were chosen for the study. Male drinkers are far more often studied and, therefore, male subjects in this study provide better potential for comparisons with other research.

In summary, four criteria for selection were devised. Subjects were: 1) male problem drinkers (by their own definition and by professional diagnosis) in treatment at in-patient alcohol facilities; 2) neither psychotic nor brain-damaged; 3) under the age of 46; and, 4) once-married---either currently married, separated, divorced, or widowed.

Selection of subjects. All subjects were in treatment at either the Brockton, Massachusetts or Northampton, Massachusetts Veterans Administration Hospitals. All were selected from among patients at those hospitals' alcohol rehabilitation programs. Subjects gave informed consent to participate in the research and volunteered their time. They represent all the patients who met the selection criteria and were willing to participate from May through July, 1975. Three veterans contacted refused to participate.

Description of subjects. Thirty male problem drinkers were interviewed. Sixteen subjects were in treatment at Northampton, fourteen at Brockton. Two of the Brockton men were unable or unwilling to give adequate responses to the interview assessing alcohol consumption. Complete data, then, are available on twenty-eight subjects. The Northampton subjects were somewhat older than the Brockton subjects (Northampton mean age = 39.6 years, Brockton mean age = 36.3 years) but this difference is not statistically significant. Educationally, the two sets of subjects

were nearly identical (Northampton mean education = 12.2 years, Brockton mean education = 12.1 years). On other demographic variables (occupational status, ethnicity, religion, and marital status when interviewed) there were no significant differences in patient populations. Therefore, data from the two hospitals were considered equivalent and pooled.

Below is a demographic profile of the subjects studied. The average age of subjects was 38.2 years; they averaged 12.1 years of education. Two-thirds of the men held blue-collar occupations. The majority were Catholic (67.9%). Protestants accounted for 17.8%, Russian Orthodox for 7%, and no religion for 7%. Irish was the most common ethnic background (32.1%), followed by French and French-Canadian (25.0%), English and Scotch-Irish (17.8%), and Russian (10.0%). Other ethnic backgrounds (Greek, Portuguese, Black, and German) accounted for the remaining four subjects. The subjects were nearly evenly divided as to the setting of their hometown. Eighteen subjects were brought up in city environments, twenty were raised in suburbs or rural locales. At the time of the interviewing, 14 subjects were married, 6 were separated, and 8 were divorced. On closer inspection it was noted that 6 of the 14 "married" subjects had been previously divorced or separated. Thus, eight of the twenty-eight subjects maintained their first marriage.

Procedure

Strategies to control distortion. The present study relied on retrospective self-report data on drinking and stress. Clinicians often contend that problem drinkers are notoriously poor reporters of their own conduct and experience, but several systematic clinical studies (Guze,

et al., 1963; Sobell & Sobell, 1975) suggest that alcoholics give reliable and valid self-reports of life history and drinking experience. Rather than denying their past troublesome experiences, alcoholics tend to report more drinking problems than either corroborating relatives or official reports would indicate. By taking precautions to exclude less reliable subjects--the older, and/or brain-damaged drinkers--the accuracy of retrospective self-report data is enhanced considerably. Further, the interviews are highly structured, so as to improve reliability and reduce distortion. The present study's method makes the best of an inherently difficult situation.

Experimenter bias and interview demand characteristics are two other methodological considerations to be concerned with in this type of research. Two steps were taken to counteract bias and demand effects. First, the two data-collection interviews were conducted by separate interviewers. The interviewer concerned with alcohol consumption had no way to know the number, timing, or impact of life events a subject reported in the life events interview. In like fashion, the life events interviewer remained uninformed of a subject's drinking pattern. This "blind" interviewer technique prohibited the experimenter from unconsciously coaxing the recall of events which coincided with drinking increases. Clearly, however, it was impossible to prevent the subjects from using memorable drinking escapades as reference points when reporting life events.

The second step taken to counteract demand characteristics involved the preliminary instructions given all subjects. Each was told that the researchers did not have any specific expectations about how drinking and

life events were related. The subjects were instructed not to try to give what they might think were "good" responses. These instructions served to undercut subjects' attempts to please the interviewers with "helpful" data. If anything, these preliminary instructions may have given the respondents a negative set concerning the relationship between stress and drinking increases.

Another factor affecting the accuracy of reporting is the attitude of the respondents. Certain subjects may generally under-report life event occurrences because of attitudes they maintain concerning personal responsibility. Respondents who attribute the cause for their drinking behavior to the disease properties of alcoholism or personal weakness are likely to under-report and under-value external life events. Conversely, persons who attribute drinking to overpowering external forces may over-report relatively insignificant life events. To reduce the effects of these methodological ensnarements, a structured life events inventory based on the standardized Schedule of Recent Experience (Holmes and Rahe, 1967) was used. Further, a rating instrument was devised to measure the degree to which subjects endorsed the notion that life events have an important impact on various spheres of life including drinking habits.

Broadly, then, the twenty-eight subjects gave self-report data by answering the Stressful Events Inventory (SEI) and the impact rating measure in one interview, and the Alcohol Consumption Interview (ACI) in another session. The specifics of these procedures and the data generated by them are described next.

Stressful Events Inventory (SEI). The SEI is composed of two sections. In the first, demographic information is obtained on eleven vari-

ables which have been cited in previous epidemiological research (Edwards, et al., 1972; Cahalan & Room, 1974) as salient in characterizing problem drinkers. These variables are: age, marital status, religious affiliation, ethnic background, intensity of ethnic identification, current residence, hometown, and the life style of those two communities (rural or urban), occupation, and educational level.

The second section gathers information on the occurrence and forewarning of twelve stressful life events plus military entrance and military discharge.¹ The list of events includes a modified version of the seventeen items on the SRE which are rated as requiring the most social readjustment. The following modifications were made. The SRE items "personal illness or injury" and "change in health of family member" were made more specific in the SEI. Personal and familial illness or injury had to require at least one week in the hospital to qualify as a life event. This narrower definition served to offset some of the vagueness in the SRE (Brown, 1974; Mechanic, 1975). The seven other highest stress items in the SRE were lifted directly to become a part of the SEI. One item, "pregnancy", was eliminated since it was inappropriate for a male sample. Another item, "sexual difficulties", was discarded for being too vaguely defined to be useful. The items, "retirement" and "fired at work" were combined to become a more general category reflecting job loss. "Business readjustment" and "change in financial state" were consolidated into "major financial change". If a subject reported a financial change he was asked whether it was an increase or a decrease in money and the

¹A copy of the Stressful Events Inventory is included in Appendix A.

reason for the financial change. The items, "military entrance" and "military discharge" were included to test an informal clinical hypothesis that drinking increases often occur in response to peer pressure at military bases. A final item was included in the SEI, one which permitted the subjects to list any other events they might have felt had been important in their adult lives. Thus, the SEI provided an a priori inventory of the major life crises while also allowing for subjectively defined idiosyncratic life stresses.

For all events which subjects said they experienced, an estimation was given for when the event occurred. In most cases dating was made in terms of the month and the year of occurrence. For events of special psychological or pragmatic importance dating to the day was common. In a few cases, subjects could only date the event by its year of occurrence. For crises which continued for several months or more, the respondents were asked to give the month during which the event's stressfulness peaked.

In addition, for each item for which it was appropriate, subjects were asked to rate the forewarning of the event. In other words, did the crisis occur with some expectation and preparation or was it a shock to the subject? No rating of expectedness was taken for marriage, the birth of children, or other situations which, by their nature, are forewarned events.

Event impact ratings. Mules, et al. (1974) report that alcoholics give lower ratings of stressfulness to the standard (SRE) life event items than non-alcoholics. The implication is that alcoholics do not perceive stressful events as having much impact on their lives. If this is so, we may suppose that problem drinkers, as a group, would make fewer cognitive

connections between stressful events and abrupt changes in their behavior patterns than the populations on whom the SRE was standardized. A further implication is that problem drinkers may report fewer life events since they perceive them as relatively unstressful and unimportant. To informally test this notion---perhaps "monitor" is a better term---an event impact measure was designed which asked the subjects to rate the extent to which "the life events you listed (in the SEI) have, in general, affected" nine spheres of living. The nine spheres were: working, playing, smoking, drinking, eating, relationships with friends, relationships with family, physical health, and general happiness.² Subjects rated the impact of life events on these nine items on a five-point scale ranging from "not at all" to "a great deal". Although the subjects' ratings of stress impact on all of the nine items was of some interest, the rating of stress impact on the amount these persons drank was of highest significance for the present study.

Alcohol Consumption Interview (ACI). Self-report data on consumption and patterning was achieved through a structured interview which lasted approximately fifty minutes. Subjects were asked to recall the age at which they first drank any alcohol. They were then asked what alcoholic beverage or beverages they typically drank at that time. Next, the interviewer asked how frequently they drank---on weekend nights, only during the summer months, or if more often, how many days per week? Last, subjects were asked how much of each alcoholic beverage they typically

²A copy of the event impact rating instrument is included in Appendix A.

consumed during a sitting. Thus, an account evolved giving information on beverage type, frequency, and per-sitting consumption. If a subject reported a change in drinking pattern within a calendar year, the new data on type, frequency, and consumption were recorded. This procedure was repeated for each year in the respondent's drinking history.

The ACI is based on interview techniques devised by Rohan (1974) and represents a longitudinal, comprehensive measure of alcohol consumption. Rather than merely measuring quantity and frequency of consumption, the ACI reflects changes in drinking patterns as well. In this respect, while a somewhat less sophisticated procedure, the ACI approaches Bowman, Stein, and Newton's Volume-Pattern Index (1975), a measurement of drinking behavior more complete than the Quantity-Frequency-Variability Index of Cahalan, Cisin, and Crossley (1969). Further, the structured nature of the ACI promotes a high degree of measurement reliability; Rohan reports test-retest r 's in the $+.80$'s.

From these data, year-by-year estimates can be made of the subject's drinking rate. Quantities of the various alcoholic beverages are converted to a standard drinking unit. One 12-ounce can of beer, one shot of whiskey (1.5 ozs.), and one 4-ounce glass of wine are all equivalent to one "drink" (0.6 oz. of absolute alcohol). The total number of "drinks" for a year is summed and divided by sixteen, giving a yearly drinking rate in pints of absolute alcohol.

On a longitudinal basis these data identified the year in which the

subject's drinking became "very heavy".³ Further, the ACI identified years in which large changes in drinking consumption occurred. In sum, the ACI provided the following information: the length of the drinking career, the age of first "very heavy" drinking, the total consumption in pints of absolute alcohol, year-by-year consumption rates, the average rate, and the years in which substantial changes occurred. What, exactly, a "substantial" change involves is addressed in the next section, along with other operational definition issues.

Operational Definitions

Drinking increase. The purpose of this investigation was to assess the relationship between event occurrence and increases in alcohol consumption. The question arose: What is an increase worth noting? Several considerations were weighed in the process of generating a meaningful definition. First, it was felt that the increase had to be a relatively rare occurrence in the drinking history. If the definition were too liberal and identified even minor upper fluctuations as "drinking increases", a stress-drinking relationship would be spuriously inflated because "increases" would occur with a frequency equal or greater than event occurrence. Second, the increase had to represent either a demonstrable departure from the subject's typical pattern of drinking or an amount of

³One definition of "very heavy" drinking, given by Parry, et al. (1974) is 21 or more sittings per month with three to five drinks typically consumed at each sitting. The upper bound of this definition (21 sittings with five drinks per sitting) is the equivalent of 47.25 pints of absolute alcohol consumed yearly.

additional intake so great as to be considered a significant change in behavior by most lay standards. At first, the operational definition was a doubling of intake from one year to the next or any two consecutive 50% increase years. However, this definition, while reflecting a departure in behavior, tended to under-identify large consumption increases at high levels of intake. In other words, an increase from 15 to 30 pints would qualify as an "increase" under the doubling definition, while an increase from 200 to 350 (ten times a greater increase) would not. Clearly a ceiling effect inhibited the identification of drinking increases at the higher end of the consumption continuum.

Another definition proved to be better. Any increase of 50 pints of absolute alcohol from one year to the next was shown to effectively estimate meaningful changes since it almost always represented high percentage changes at the lower end of intake and still tagged low percentage but conceptually important behavior changes at the upper end. To make this definition more real, let us translate 50 additional pints of absolute alcohol into concrete terms. Fifty pints is the equivalent of a subject's adding 25 drinks of whiskey (or a case of beer) to his normal drinking each week for 52 straight weeks. This rate of consumption alone is above that which is considered "very heavy" drinking.

There is a drawback to this non-graduated definition. The heaviest drinkers are more likely to have 50 pint increases than lighter drinkers. This in turn may inflate the number of stress-drinking associations among the heaviest drinking subjects. In these matters it appears that all operational definitions are arbitrary and, to one degree or another, vul-

nerable to over- or under-estimations. However, it would seem that the 50 pint definition is superior to any percentage-based definition in that it does not fall into the dual trap of masking large increases at the upper end of consumption while calling attention to relatively minor changes at the lower end.

Event-drinking association. An event-drinking association was defined as a year in which the subject increased his consumption by 50 pints of absolute alcohol (a drinking increase) and experienced a life event. This can be seen as a conservative estimate of drinking-stress correspondence for several reasons. First, the operational definition given an "increase" is purposefully a demanding one, insuring the relatively rare definitional occurrence of the phenomenon. Second, life events are taken from an inventory of twelve stressful items, two military events, and the events a subject might volunteer. This is a rather short list considering all of the stresses a person may feel over, say 20 years. Therefore, the likelihood that two somewhat rare occurrences ---a 50 pint increase and a life event---coincide is rather small, making this definition a conservative one. Furthermore, the definition provides no flexibility of lag-time since the increase and event must occur in the same year. Research by Rahe and his associates (e.g., Rahe, Mahan, & Arthur, 1970) is based on the assumption that physical illness responses to stressful events correlate after as much as an eighteen month lag-time. In his large-sample studies it was possible to perform sophisticated autocorrelations which statistically defined appropriate and meaningful lag-times. However, the cruder dating accuracy and small-

er samples of the present study preclude the use of such methods. An armchair decision concerning appropriate lag-times between stress and drinking increases was considered too arbitrary. The investigator preferred to make "association" a consistent and perhaps restrictive term. Even when dating was accurate enough to show that a drinking increase beginning in January followed a life stress in December of the previous year, no association was registered.

Sub-categories of life events. Any inventory of life events comprises an assortment of sub-categories of events which highlight separate aspects of social readjustment. One clear subclassification uses the dimension of desirable-undesirable. Social norms dictate that the birth of a child is generally seen as a happy, desirable occurrence (although, to be sure, one can imagine a variety of circumstances under which a birth is less than felicitous), while a divorce is generally seen in a negative light (though, here again, one can think of circumstances under which certain individuals might leave divorce court grinning broadly). Despite the problems of individual idiosyncracies, life events are commonly classified as desirable or undesirable (Paykel, 1974; Vinokur & Selzer, 1975). Following the Paykel example, this study defined the following events as "desirable": marriage, the birth of children, marital reconciliation, and financial increase. These events were defined as "undesirable": physical illness or injury to self, illness or injury to a family member, death of a close relative or friend, death of spouse, marital separation, divorce, financial decrease, fired or laid off at work, and major legal troubles.

Paykel (1974) also offers two classes of events reflecting changes in the immediate social field of the subject. Entrances refer to events which involve the introduction of a new person into the social field; exits refer to events which involve a departure. For the present study "entrance" events included marriage and the birth of children. "Exits" included death of a close family member or friend, death of spouse, marital separation, and divorce.

Another category of events was devised. As with other psychological disorders, the interrelationship of stress and behavior change is a complex one. In the case of alcohol abuse, changes in drinking behavior may be triggered by stress, or stress may be the consequence of alcohol abuse, or stress and drinking may create a system of mutual impact in which the determination of cause and effect is neither tenable nor indicated. We have stated how certain events are typically the consequence of heavy drinking ("dependent" events) while other events are rarely or never the consequence of heavy drinking ("independent" events). Those events defined as "independent" events were: the birth of children, illness or injury to a family member, the death of close relatives or friends, the death of a spouse, financial increase, imprisonment (when the offense clearly had nothing to do with drinking), and any other non-drinking related events offered by the subject. All other events were considered "dependent" events to some degree.⁴

⁴The reader should understand that just because an event might be the consequence of drinking it need not be considered a "dependent" event. The degree to which drinking precipitates a stressful event is clearly influenced by a host of contextual factors. Without more extensive interviewing of respondents and other informants such judgments of "dependence" must remain undetermined.

C H A P T E R I V

RESULTS

Life Events

Complete SEIs were obtained from thirty subjects. Subjects reported events occurring during their adult lives. On the average the reporting time span was 21.0 years, ranging from 8 to 29 years. The sample reported a total of 495 events. The highest number of events reported was 25, the low was 10. The mean number of events was 16.36, the median 16. The two most frequent items reported were the birth of children and personal illness or injury. These two items accounted for 30.5% of all the reports. The least frequent were divorce, marital reconciliation, and death of spouse. These accounted for only 4% of all the items reported. Table 1 gives the frequency distribution of the life events reported by the 30 subjects. These results are, in some respects, comparable to those of T. S. Holmes (reported in Holmes & Masuda, 1974) who surveyed the life experience of 199 medically hospitalized patients. In her sample, divorce and death of spouse were two of the lowest frequency events, and personal illness or injury was among the two most frequent. However, fired at work was an extremely infrequent item in that sample whereas in the current study that item ranks near the top. In fact, the number of firings and lay-offs in the present study is a gross underestimate since in at least ten cases respondents said that they had been fired or laid off so many times they could not enumerate them all. They were asked to report only the most memorable or stressful job disruptions.

TABLE 1
FREQUENCY DISTRIBUTION OF
LIFE EVENTS FOR ALL SUBJECTS

<u>Event</u>	<u>Number of Occurrences</u>	<u>Occurrences per subject</u>
Birth of child	81	2.70
Personal injury or illness	69	2.30
Financial change*	37	1.23
Marriage	34	1.13
Injury or illness to family member	33	1.10
Fired or laid off at work*	32	1.07
Entry into military	30	1.00
Discharge from military	30	1.00
Death of close relative	28	0.93
Legal troubles	23	0.77
Death of parent	22	0.73
Marital separation	21	0.70
Other	21	0.70
Death of close friend	14	0.47
Divorce	13	0.43
Marital reconciliation	7	0.23
Death of spouse	0	0.00
	<u>495</u>	

*These are undoubtedly low estimates of actual occurrence.

The subjects reported more undesirable events than desirable events (319 vs. 176). However, taking into account the larger proportion of undesirable events on the SEI, this represents no significant difference from expected event reporting ($\chi^2 = 1.00$, Yates' correction, $p < .25$). Of the 304 events which subjects rated as either expected or unexpected, no significant difference was found in the occurrence of items. Expected events numbered 142, unexpected 162 ($\chi^2 = 1.31$, $p < .25$). There was also no statistically significant difference between the occurrence of entrance events (118 reported) and exit events (92 reported) ($\chi^2 = 2.97$, $p < .10$).

Event Impact Ratings

Twenty-eight subjects completed the event impact ratings. They rated the amount they drank as most influenced by stressful life events (see Table 2). A one-way analysis of variance was performed and showed a significant difference at the .005 level. A Newman-Keuls procedure (Winer, 1971) was then computed and it was found that, in comparing the nine items rated, the perception of event impact on amount drunk was significantly higher than on five other items (work, play, eating, friendships, and health). We can conclude that the greatest proportion of variance in the significant F ratio is accounted for in differences between drinking ratings and the rest of the listed items.

Ratings of event impact also proved to be related to the respondents' experience of stressful events. Ratings on the nine items were

TABLE 2
 MEANS AND STANDARD DEVIATIONS OF RATINGS OF
 EVENT IMPACT ON NINE ASPECTS OF LIVING

	I	II	III	IV	V	VI	VII	VIII	IX
Mean:	2.36	2.23	3.24	4.03	2.76	2.76	3.46	2.73	3.69
S.D.:	1.35	1.40	1.51	1.09	1.33	1.37	1.55	1.85	1.09

Note: I = "Your ability to work"
 II = "Your recreational life"
 III = "The amount you smoke"
 IV = "The amount you drink"
 V = "The amount you eat"
 VI = "Your relationship with friends"
 VII = "Your relationship with family"
 VIII = "Your health"
 IX = "Your general happiness"

aggregated and, using a Pearson product-moment procedure,¹ were found to correlate significantly with life event scores ($r = +.367$, $p < .05$). This indicates that as subjects experience more stress their perception of its impact on their behavior increases monotonically.

Alcohol Consumption

Complete ACI data were reported by twenty-eight subjects, and can be located for each individual in Appendix B. The average "drinking career" was 22.32 years, ranging from 8 to 31 years of drinking. On the average, these men began drinking at 16.25 years of age, and became "very heavy drinkers" by 20 to 25 years. They averaged 159.78 pints of absolute alcohol per year, and, over the course of their drinking career, averaged 3,552.0 pints. The 159.78 figure is the equivalent of more than one pint of whiskey consumed each day every day over the drinker's adult lifetime. Combined, these 28 men drank 102,459 pints of absolute alcohol or the equivalent of a staggering (pun intended) 160,092 fifths of 86-proof whiskey!

¹Parametric statistical procedures are used in the current study. This is justified under the assumption that the respondents are representative of a normally distributed population sample. While we must be aware that the study sample is small and non-random, it adequately reflects an hypothetical population of middle-aged males who receive treatment for drinking problems. The Northampton and Brockton VA's are not a random sampling of all in-patient institutions, but neither are they grossly atypical. Within the criteria for sampling previously outlined (once-married, non brain damaged, etc.), the respondents represent all but three of the patients available for study between May and July, 1975. Further, we can assume that the phenomena under study --- the occurrence of life events and drinking behavior --- are normally distributed in the population sample. There is no convincing evidence to assume otherwise.

The data also show a wide range of drinking rates which preceded hospitalization for drinking problems. The average drinking rate in the year before hospital admission was 209.68 pints of absolute alcohol, but the rates ranged from 45 to 764 pints.

The drinking pattern of each subject was also analyzed. There were 99 drinking increases among all subjects. Only one subject reported no increases, while two subjects reported eight increases. On the average, subjects experienced 3.5 drinking increases over a 22.3 year drinking history, or .158 increases per year. In this respect the operational definition of a 50 pint increase served its purpose --- a drinking increase is a relatively rare occurrence. (By comparison, life events for this sample occurred at the rate of .835 per year.)

Subjects reported widely varied patterns of consumption. Some men increased their consumption incrementally and maintained each new higher level of drinking. Others fluctuated greatly with decreases and increases occurring with nearly equal frequency. To better quantify these patterning characteristics, a ratio of drinking consistency was devised. The ratio compares the years in which a subject decreased and maintained lower consumption with the total number of change years possible. Specifically, the ratio is:

$$\text{consistency ratio} = \frac{\text{number of decrease drinking years} + \text{years drinking remains constant after a decrease}}{\text{total drinking years} - 1}$$

The average consistency ratio was .213. This means that during 21.3% of all the possible change years, the subjects were either reducing

their intake or maintaining lower rates. However, there was considerable range in consistency scores. One drinker scored 0.00; at the other extreme one respondent scored 0.48. For the latter, nearly half of his drinking career was spent either decreasing consumption or maintaining lower amounts. This tended to support the anticipated trend that drinking patterns would show periods of decline as well as increase and maintenance.

Life Events and Alcohol Consumption

Subjects' drinking rate (pints of absolute alcohol consumed per year) was correlated with their total number of life events. The product-moment correlation indicated a highly significant relationship ($r = +.696$). This result does not shed much light on the etiological influence of life stress on drinking behavior. A correlational analysis between independent life events and drinking does a somewhat better job since it eliminates from consideration those events which are likely to result from heavy drinking. The product-moment correlation for independent events and drinking rate did not prove to be a statistically significant one ($r = +.23$, $p < .12$), though it was in the expected direction.

Event-drinking increase associations. Another way of examining the event/consumption relationship is to look for event-drinking increase associations. As described in the Method section, an association was defined as a year in which a 50 pint increase coincided with one or more life events. Fifty associations occurred in the lives of the 28 subjects (mean = 1.78). The next step in the analysis was to see which

events were most frequently associated with drinking increases.

The reader may remember that high association events were anticipated to be undesirable events. Table 3 shows the number of desirable and undesirable events associated with drinking increases.

TABLE 3

FREQUENCY OF DESIRABLE AND UNDESIRABLE EVENTS

OCCURRING IN ASSOCIATION WITH DRINKING INCREASES

<u>Category of Event</u>	<u>Association</u>	<u>No Association</u>
Desirable	23 (16.5%)	116 (83.5%)
Undesirable	59 (21.5%)	216 (78.5%)

A chi-square was performed and no significant difference was found between desirable and undesirable events and their association with drinking increases.

Another expectation was for unexpected events to be high association events. Table 4 shows that significantly more unexpected events coincided with drinking increases than did expected events ($\chi^2 = 8.67$, Yates' correction, $p < .005$).

TABLE 4

FREQUENCY OF EXPECTED AND UNEXPECTED EVENTS

OCCURRING IN ASSOCIATION WITH DRINKING INCREASES

<u>Category of Event</u>	<u>Association</u>	<u>No Association</u>
Expected	90 (63.4%)	52 (36.6%)
Unexpected	127 (79.4%)	33 (20.6%)

A statistically significant difference in the expected direction was also found between entrance and exit events as is shown in Table 5 ($\chi^2 = 5.28$, Yates' correction, $p < .025$).

TABLE 5

FREQUENCY OF ENTRANCE AND EXIT EVENTS

OCCURRING IN ASSOCIATION WITH DRINKING INCREASES

<u>Category of Event</u>	<u>Association</u>	<u>No Association</u>
Entrance	14 (13.7%)	88 (86.3%)
Exit	30 (22.9%)	101 (77.1%)

Three "control" events were designed into the study. All subjects experienced one military entrance, one military discharge, and at least one marriage. These events had essentially equal probabilities of association with drinking increases (approximately .22). As shown in Table 6, chi-square analysis determined there was no statistically significant relationship between the control events ($\chi^2 = 0.13$, $df. = 2$, $p < .50$).

TABLE 6

FREQUENCY OF "CONTROL" EVENTS

OCCURRING IN ASSOCIATION WITH DRINKING INCREASES

<u>Category of Event</u>	<u>Association</u>	<u>No Association</u>
Military entrance	6 (21.4%)	22 (78.6%)
Military discharge	6 (21.4%)	22 (78.6%)
Marriage	6 (18.7%)	26 (81.3%)

It was also anticipated that highly stressful events at the upper end of the SRE would have high probabilities of association with drinking increases. Those events are: the death of a spouse or close relative, marital separation, divorce, and legal troubles. As we can see in Table 7, two desirable events, marital reconciliation and financial increase, were events having the highest probabilities of association. Two anticipated events---divorce and legal troubles---were among the top four.

TABLE 7
PROBABILITY OF ASSOCIATION WITH
DRINKING INCREASES FOR ALL EVENTS

Event	Total Number	Number Associated with Increases	Probability of Association	Type of Event*
Marital recon- ciliation	7	3	.428	D
Financial increase	17	6	.353	D, I
Divorce	13	4	.307	U
Legal troubles	20	6	.300	U, I
Death of close friends	14	4	.286	U, I
Financial decrease	20	5	.250	U
Marital separation	21	5	.238	U
Marriage	26	6	.231	D
Illness or injury (self)	66	15	.228	U
Illness or injury (family member)	28	6	.214	U, I
Military entrance	28	6	.214	?
Military discharge	28	6	.214	?
Fired or laid-off	31	5	.161	U
Other	21	3	.143	?
Death of relatives	35	5	.143	U, I
Birth of children	73	8	.109	D, I
Death of parents	21	2	.095	U, I
Death of spouse	0	0	.000	U, I
All events	469	95	.202	

*"D" indicates a desirable event; "U" indicates an undesirable event; "I" indicates an independent event; "?" indicates an event of undetermined desirability.

The overall probability of an event occurring in association with an increase was .202. Curiously, the events involving the death of close relatives were among the lowest probability events.

High association drinkers. Another goal of the study was to differentiate drinkers who might be stress-respondent from those who are not. To check this we must look at the subjects who had few event-drinking associations, those who had many, and the factors which characterize the two groups. Four respondents had zero associations, 9 had 1 association, 10 had 2 associations, 1 had 3 associations, 3 had 4 associations, and 1 had 6 associations. It was found that among subjects who experienced at least one event-drinking association there was little variability in the number of years over which associations might have occurred. Among these associators, those with four or more associations were somewhat younger than the rest. Non-associators were younger and had briefer drinking careers, as can be seen in Table 8.

TABLE 8

MEAN AGE AND DRINKING CAREER LENGTH FOR
SUBJECTS WITH DIFFERENT LEVELS OF EVENT-INCREASE ASSOCIATIONS

	<u>Zero</u> <u>Assocs.</u>	<u>One</u> <u>Assoc.</u>	<u>Two</u> <u>Assocs.</u>	<u>Three</u> <u>Assocs.</u>	<u>Four or more</u> <u>Assocs.</u>
	N = 4	N = 9	N = 10	N = 1	N = 4
Mean age	33.75	40.33	38.40	42.00	36.50
Mean years of drinking	17.25	23.55	22.00	25.00	22.25

Table 9 provides a summary of comparisons between non- and "high" associators on demographic, event, event impact rating, and drinking variables.

It cannot be said that the demographic variables effectively differentiate the two groups. Ethnicity showed no clear pattern of results. Other variables, such as hometown and religion, failed to differentiate the groups and were left out of Table 9. However, as was anticipated, high associators showed somewhat lower socioeconomic standing than the non-associators in terms of educational level and occupational status. Also, two of the non-associators were married when interviewed while all of the high associators' marriages were dissolved (subject #09 had been separated for more than four years when interviewed).

Those with four or more associations reported fewer life events than the non-associators, but rated their impact on drinking at the same level, "a great deal." The high associators had higher drinking rates and more increases than the non-associators.

TABLE 9

COMPARISON OF SUBJECTS WITH ZERO AND FOUR OR
MORE ASSOCIATIONS ON DEMOGRAPHIC, EVENT, AND DRINKING VARIABLES

(Subjects with Zero Associations)

<u>Variable</u>	<u>Subject #03</u>	<u>Subject #05</u>	<u>Subject #06</u>	<u>Subject #17</u>
Age (mean = 33.75)	38	29	36	32
Education (mean = 13.0)	12	12	12	16
Occupation	Laborer	Civil Service Worker	Electrician	Teacher
Marital Status	Divorced	Married	Married	Divorced
Ethnicity	English/ French	Irish	Irish/ German	English
Total life events (mean = 24.5)	26	25	22	25
Rating of event impact on drinking	5	5	5	4
Average alcohol consumption (mean = 109)	133.9	127.3	98.9	75.7
Years of drinking (mean = 17.25)	21	13	21	14
Drinking increases	2	3	0	1

TABLE 9

COMPARISON OF SUBJECTS WITH ZERO AND FOUR OR

MORE ASSOCIATIONS ON DEMOGRAPHIC, EVENT, AND DRINKING VARIABLES

(Subjects with Four or More Associations)

<u>Variable</u>	<u>Subject #07</u>	<u>Subject #09</u>	<u>Subject #16</u>	<u>Subject #19</u>
Age (mean = 36.5)	29	43	44	30
Education (mean = 12.0)	14	12	12	10
Occupation	Laborer	Cabinet Maker (unemployed)	Custodian	Carpenter
Marital Status	Divorced	Separated	Divorced	Divorced
Ethnicity	Irish	Russian	Black	Irish
Total life events (mean = 19.25)	25	15	21	16
Rating of event impact on drinking	5	5	5	5
Average alcohol consumption (mean = 301)	336.2	354.7	131.6	381.3
Years of drinking (mean = 22.25)	17	25	26	21
Drinking increases	6	8	5	8

Qualitative Examination of the Data

The goal of the previous analysis was to quantitatively sort out some key relationships between various aspects of life events and alcohol consumption. Although restricted by a relatively small sample of respondents, these group analyses suggested some general trends across subjects. Alternatively, some varied patterns of association can be found between individuals. Four such patterns result from combining two key dimensions: 1) consistency (versus fluctuation) of drinking pattern and 2) degree of association between drinking increases and life events. The four identifiable, though overlapping, patterns are: 1) progressive/stress respondent; 2) progressive/non-stress respondent; 3) fluctuating/stress respondent; and 4) fluctuating/non-stress respondent.

This typology was generated through the following procedure. As was mentioned earlier, a consistency ratio was computed for each subject to measure the degree to which his drinking rate fluctuated. Drinkers at the low end of the continuum could be characterized as "progressive" drinkers. Their consumption either increased or remained constant, a pattern consonant with a disease model of alcoholism. Drinkers at the high end of the continuum might be called "fluctuating" drinkers.

Subjects were also placed on a continuum of stress-responsivity. Those who had a small percentage of drinking increases which coincided with events were called "non-stress respondent." "Stress respondent" drinkers had a high percentage of drinking increases associated with events.

The data base is not sufficient to quantitatively analyze these varied patterns and their correlates. Instead, a presentation of case illustrations can serve to demonstrate their presence in the sample, as well as to make more vivid the various dimensions of consumption and life events which have been analyzed throughout this chapter. The four case histories represent the extreme examples of each type. Selection of the cases was made by placing all subjects on a grid with their location being determined by their consistency and stress-responsivity ratios. Extreme scores in each of the four quadrants were chosen as representative of that type of drinking pattern.

The Results section concludes with these four case illustrations. To make each story more understandable, a graph of alcohol consumption and life events is presented (Figures 1-4).

Progressive/stress-respondent pattern (Subject #30). This subject exemplifies the "progressive alcoholic" whose large increases in consumption coincide with stressful experiences. At the time of the interview this respondent was 37, married, and the father of four children. Raised in the industrial northeast section of Pennsylvania, he dropped out of high school at 16, and in the same year began drinking. From a low rate he increased his consumption in consistent, small increments. When he entered the military at 20 he was averaging the equivalent of one six-pack of beer every other day. While in the military his intake rose enormously, doubling during his two-year hitch. This was the first large increase in his drinking career and it coincided with his military experience. In 1960, the year of his discharge, he was averaging a pint of liquor daily. That level was maintained through the next year when he married, but again rose sharply the following year. The increase in 1962, a change of 45%, and roughly an additional $\frac{1}{2}$ pint of whiskey consumed per day, occurred in coincidence with two stressful events. At that time he underwent major surgery just after the birth of his first child.

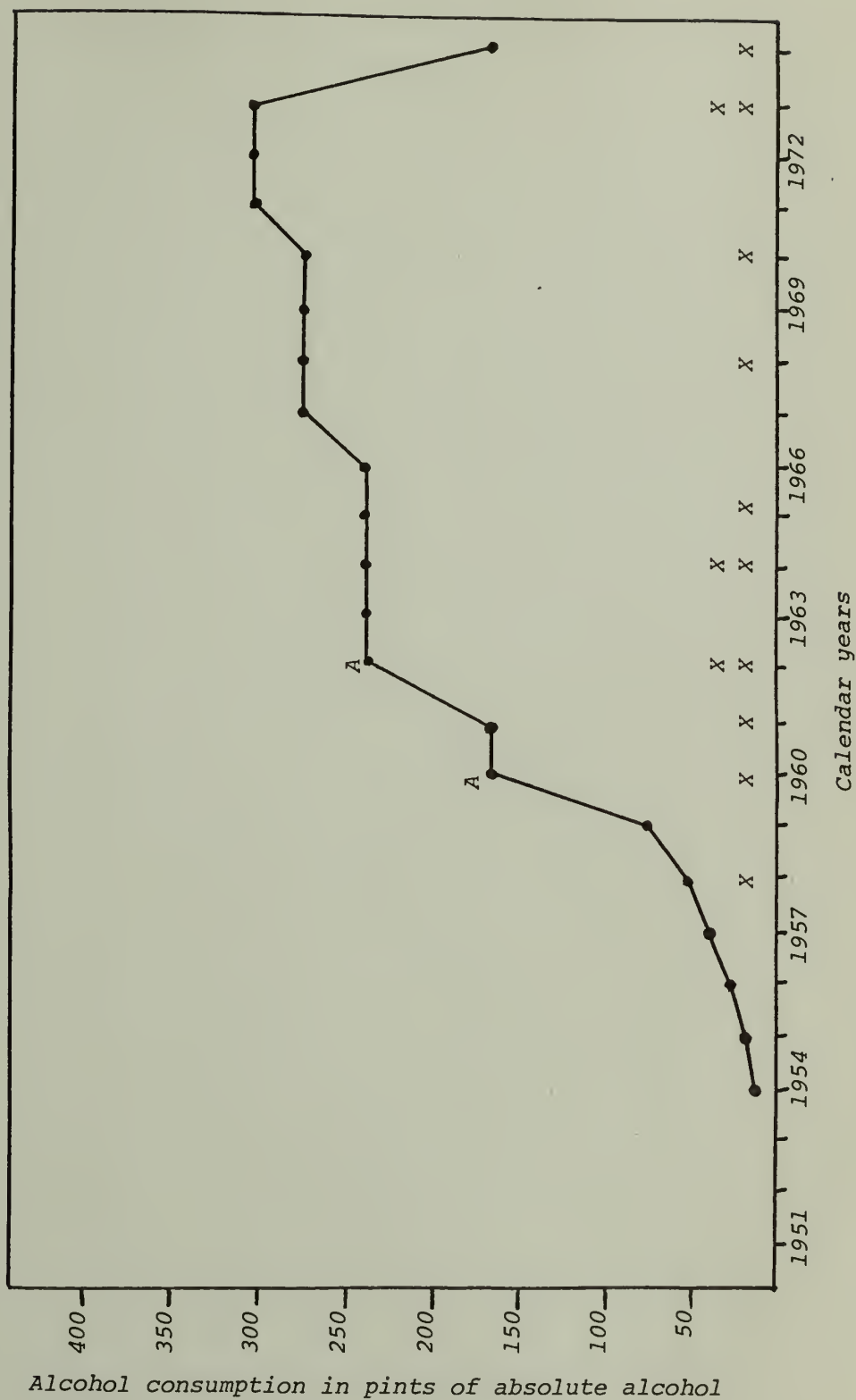
Following this drinking increase and the coincident stress, this subject experienced few life events and few drinking changes. From 1963 through 1969 four events occurred including the birth of two children and during that time this man increased his intake once, a change of 16%. In 1971, there was another small increase (+10%) which occurred several months after his mother's surgery for the amputation of a limb.

For nineteen years of drinking this subject only increased or maintained his level of consumption. There were two significant increases, in

FIGURE 1

Temporal relationship of life events and drinking increases

(An example of progressive/stress-responder pattern, Subject #30)



1960 and in 1962, both of which were associated with life events: the first with military experience; the second with the birth of his first child and major surgery.

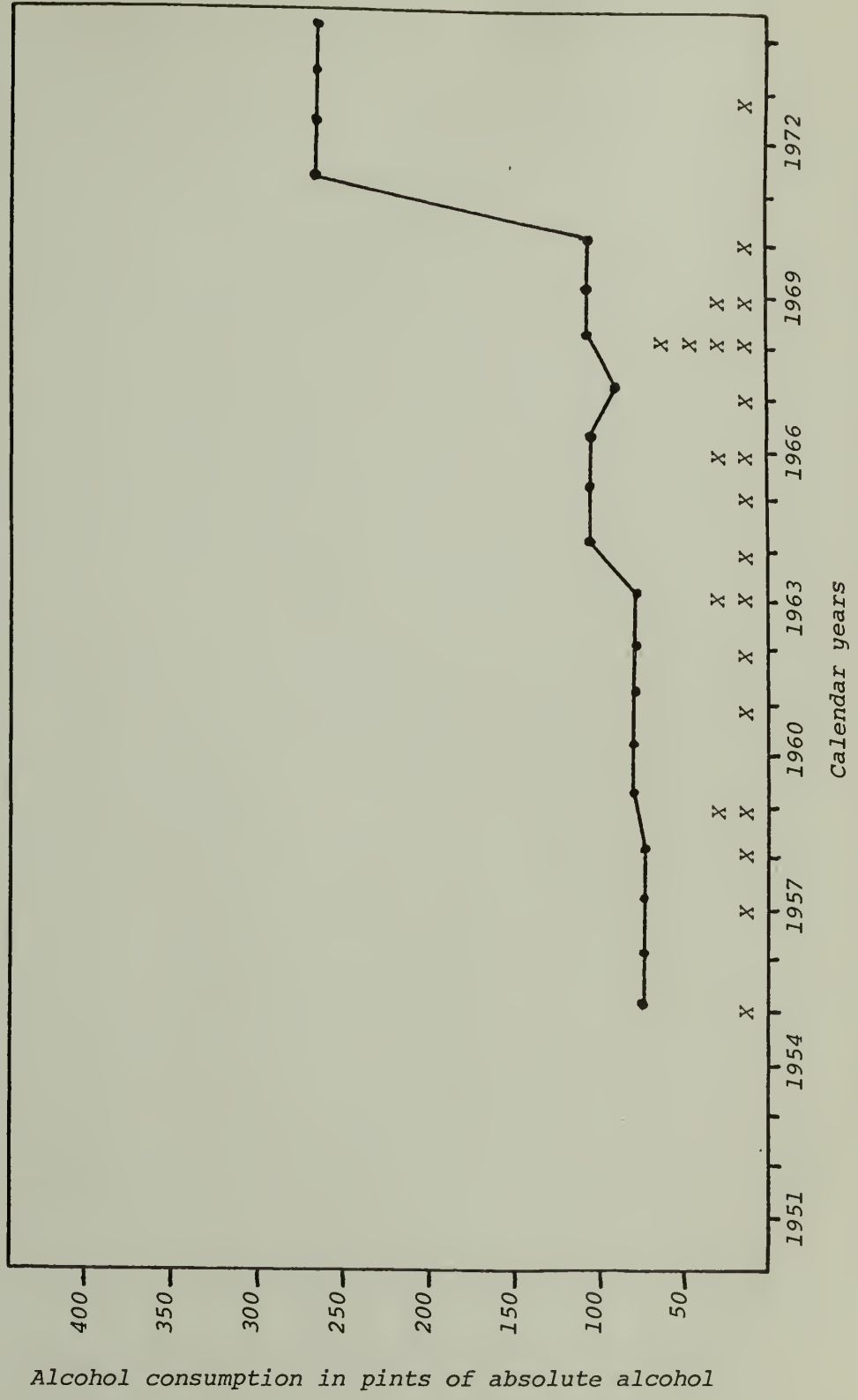
Progressive/non-stress-respondent pattern (Subject #03). This subject was 37 years old when interviewed. A construction laborer from rural Vermont, he had been divorced for approximately six years. At the age of 17 he enlisted in the military. In this year he began drinking and started at a high rate of consumption --- roughly a half pint of whiskey per day every day. After two years in the service, he was married, perhaps forced to, since his first child was born three months after the wedding. Over the next eight years he became a career military man, a father for a second time, and despite the loss of both grandfathers within a year's time and injuries from a car accident which required three months' recuperation, his drinking rate remained virtually constant.

In November, 1963, his father became ill with emphysema and at the same time his father-in-law died. In the spring of the following year the father died as well. In association with these events, the subject increased his drinking by some 37% and then leveled off at the rate of roughly three-quarters of a pint of whiskey daily. In the winter of 1966 he heard rumors that while he was stationed overseas, his wife was having an affair with another man. Impulsively, he left the service, losing the veterans' benefits of more than eleven years' duty, and returned home to find out if she had been unfaithful. He never found out, but within a year and one-half, now retired from the service and looking for work, he separated from his wife. Over the next year or so there was a recon-

FIGURE 2

Temporal relationship of life events and drinking increases

(An example of progressive/non-stress-responder pattern, Subject #03)



Note: "A" indicates an event-increase association; "X" indicates a life event.

ciliation, a second separation, and finally a divorce in October of 1969. Throughout all of these financial and marital crises the subject's drinking remained at the same level. However, in 1971, one year after experiencing legal troubles which he would not specify, his drinking more than doubled. By 1972, he was consuming just less than 2 pints of liquor daily. He was fired from a job in 1973, an event which neither increased nor decreased his consumption. Between 1974 and 1975 he again increased his intake greatly. By the time of his admission for treatment he consumed an average of one-and-three-quarters fifths of whiskey each day. This increase, as most of the others, occurred in the absence of any clear precipitating event. Of special note in this case is the virtual absence of any decreases in drinking.

This subject, despite some highly stressful life crises, shows little stress-respondent drinking and may be seen as an example of the "progressive alcoholic", a person who steadily increases intake with no events associated to these increases.

Fluctuating/stress-respondent pattern (Subject #16). This man's drinking pattern typifies a high degree of fluctuation in which drinking increases coincide with stressful events.

The respondent, a 44 year old black man from rural Georgia, began drinking in 1948 at the age of 18. In more than half the following 27 years he either increased or decreased his intake. He maintained clearly "alcoholic" levels of drinking, but also social levels of drinking, and those in between. The first major consumption increase occurred in 1952 when he almost quadrupled his intake. This increase coincided with

his discharge from the military. It was his return to rural Georgia and easily accessible moonshine whiskey which he credited with generating this increase.

The following year he also increased his consumption --- by more than 150% --- so that he was consuming a fifth of moonshine on 5 out of every 7 days. This increase in 1953 took place while he courted and married his first wife. But in October, 1953, with the birth of the first child, he reduced his intake to social drinking levels. For the next four years he drank a fifth of moonshine over a weekend and was largely abstinent the rest of the week. Then, late in 1957 and early 1958, he experienced a major marital upheaval. The couple first separated then reconciled. During this time, the subject's drinking shot up to its previous heavy rate.

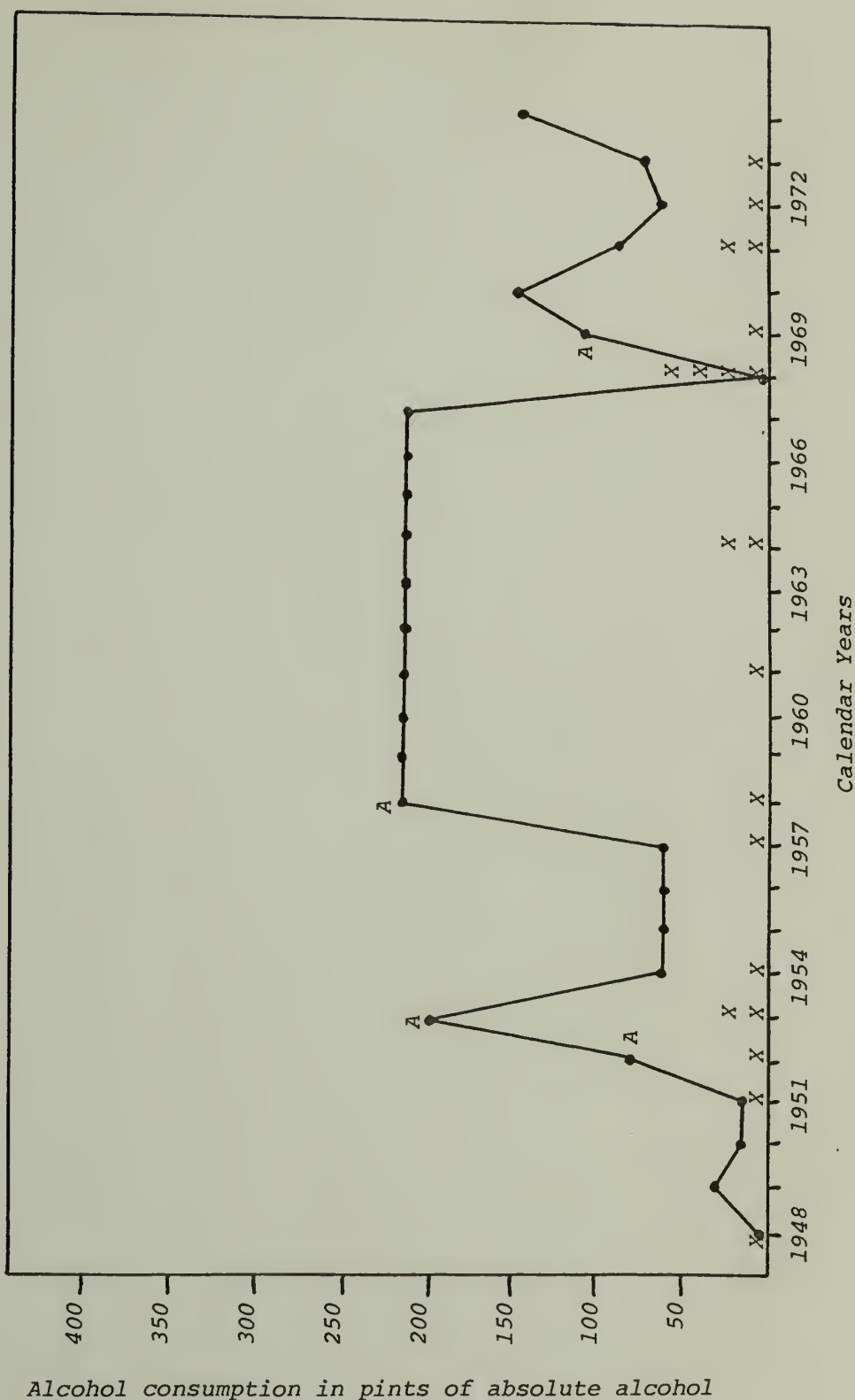
It remained at that rate, approximately $1\frac{1}{2}$ quarts of wine daily plus 3 pints of whiskey over the weekend, for the next nine years. In those nine years the subject was divorced and remarried, events which were not reflected in drinking changes. In 1968, the subject reduced his intake to practically nothing. He reports having perhaps six pints of whiskey for the entire year. This decrease was associated with the unexpected illness and subsequent death of his mother.

He moved to Los Angeles in early 1969 and remained abstinent for three months, but after being fired from a job, he began drinking heavily --- $\frac{1}{2}$ gallon of wine six out of seven days per week. In the following year he reduced his intake by more than one-third and further reduced it the next year. These decreases coincided with the financial security

FIGURE 3

Temporal relationship of life events and drinking increases

(An example of fluctuating/stress-responsive pattern, Subject #16)



Note: "A" indicates an event-increase association; "X" indicates a life event.

that came with a good janitorial job. His last drinking increase in 1974 occurred in the year when he could obtain only temporary employment, a situation which was generated by alcohol abuse rather than promoting alcohol abuse.

In sum, this subject shows a variety of drinking patterns with several major consumption increases. In almost all of them, there is an accompanying social stressor. Equally important, many of his drinking decreases seem to be influenced by events in the social world.

Fluctuating/non-stress-respondent drinking (Subject #14). A 42 year old Bostonian with a wide range of occupational experience, this subject represents a drinker who consumed at both "alcoholic" and social levels. He first began drinking at 18 when he enlisted in the Air Force. He was a very heavy drinker from the start, consuming an average of a fifth of liquor per day every day. During his four year hitch he maintained this level of drinking despite the experience of major life stress. In 1952, his second year in the service, his mother developed cancer and, within a month, died. There was an important change in his drinking in 1956, however. In that year, perhaps in response to both his military discharge and his marriage, he reduced his intake by more than 75%. For the next four years he drank at a rate associated with social drinking --- approximately three six-packs of beer per week. During these years three children were born. In 1961, his alcohol consumption skyrocketed to more than a pint of liquor and 2 six-packs daily. This was in apparent response to a back operation and the boredom of 27 months during which he did not work. The following year shows even more drinking --- an in-

crease of 28% --- without a clear precipitating factor. For the next three years this subject experienced several stresses: a car accident, a bout with pneumonia, the birth of another child, the death of a very close friend (from an alcohol-related illness), and a gall bladder operation. However, his drinking rate remained constant.

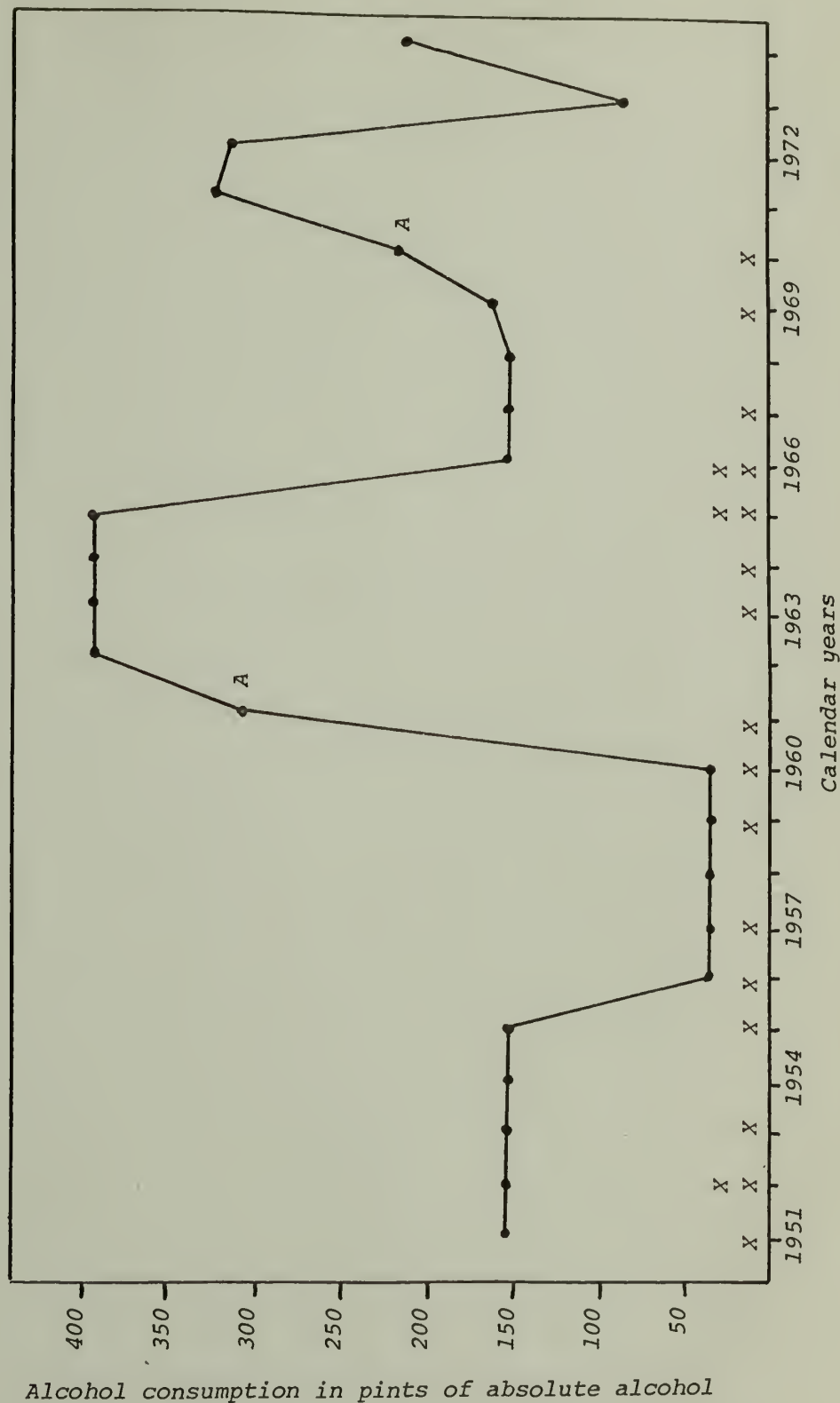
In 1966, he vastly reduced his intake as he had ten years before. This decrease, to levels approximating his drinking while in the Air Force, occurred when he got a good job with an auto manufacturer and felt financial security for the first time in several years. In that same year, though, he separated from his wife. The divorce was finalized some twenty months later in October, 1967. In 1970, the drinking again increased, and even more in 1971 until it equalled his previous high --- roughly a fifth and two six-packs daily. One event is associated with this increase, his arrest and conviction for assaulting a police officer, an event more likely to be the consequence of heavy drinking than the determinant of it.

In the period 1972-1975, the subject increased his consumption once while decreasing it twice. In none of these years were any stressful events occurring which might relate to the drinking pattern changes. In summary, this man shows a high degree of consumption change, decreases as well as increases, but without many increases in clear response to events.

FIGURE 4

Temporal relationship of life events and drinking increases

(An example of fluctuating/non-stress-responder pattern, Subject #14)



Note: "A" indicates an event-increase association; "X" indicates a life event.

C H A P T E R V

DISCUSSION

The reader will recall that the present study takes a longitudinal, interactional, and multicausal approach to understanding stress and drinking behavior. Let us now examine the results of the research in the light of that approach. This discussion section will be presented in six sections. The first three examine what might be considered the components of the study: life events, event impact ratings, and alcohol consumption and patterning. The fourth section is concerned with the life events which proved to have the highest probability of association with drinking increases. The fifth section involves a discussion of the characteristics of "high association" drinkers. The final section brings together the longitudinal and interactional aspects of these findings. Here a model of stress and drinking behavior is generated, analyzed, and clinical and theoretical implications are discussed. For each section, the study's anticipated findings and the published findings of other researchers are reviewed, compared, and assessed. In addition, each section concludes with the theoretical and clinical implications derived from the results.

Life Events

Data presented here support the findings of previous researchers (Aponte & Miller, 1972, Bell, et al., 1975, Mules, et al., 1974) that persons hospitalized for drinking problems experience a high degree of stressful life change. The clinical observation that problem drinkers lead especially turbulent lives is buttressed by systematic inquiry.

There are a variety of ways to account for this finding.

First, the subjects in the previous studies as well as the current one were drawn from state hospital or V.A. hospital populations. They are, therefore, samples which over-represent drinkers from lower socioeconomic classes. The occupation and education of subjects in the present study reflect predominantly working class or lower class backgrounds. Epidemiological research (Dohrenwend, 1973b) indicates that lower socioeconomic persons experience greater life stress than upper socioeconomic persons. Thus, the high rate of life change reported in the present work may be a characteristic of persons from lower class backgrounds rather than a characteristic of problem drinkers.

Second, the degree of life stress may be related to this sample's ethnic and religious background. More than two-thirds of the sample were Roman Catholics. That "birth of children" was the most often reported event for the sample is, therefore, understandable. To the author's knowledge, no research on life change has controlled for the variables of ethnicity and religious preference. We may suspect that Roman Catholic subjects will report more births, more deaths of relatives, and fewer divorces than Protestant or Jewish subjects although there is no systematic data to support this. But what other aspects of life crisis may correlate as well? It is conceivable that ethnicity and religion influence the rate of job loss, injury or illness to family members, and legal involvements.

The cultural factors involved in the experience of life events are as yet uninvestigated. Evidence from the present study gives some indication that research directed at this issue may prove fruitful.

A third explanation rests more directly on the characteristics of problem drinkers and the consequences of alcohol abuse. Among the most frequently reported events were "personal injury or illness", "financial change", "fired or laid off at work", and "legal troubles". These events may be seen as the consequences of heavy drinking --- what we have called "dependent events". The finding that drinkers experience a high rate of life change may simply identify what is intuitive: stress and drinking are iterative, interdependent phenomena.

A more provocative interrelationship involves what we have called "independent" events and drinking. It is, therefore, important to separate dependent events from independent events. Thus far, explicit attempts to do this are unreported in the literature, but the need for such an effort is obvious. To the extent that problem drinkers experience more "independent" life events than other populations, we can say they need to cope with more "unearned" stress than others. At this point we do not know whether the turbulence of drinkers' lives is mostly due to self-inflicted stress or bad luck and traumatic happenstance.

In his clinical work, the author has often noted the incredible bad luck and anguish which characterize many problem drinkers' lives. Many clinicians stereotype problem drinkers as responsibility-evading, manipulative story tellers. (This perjorative typecasting is particularly sinister when a wide disparity in socioeconomic background separates the client and clinician). What would seem more helpful is a careful empirical study of the problem. Does, in fact, a subpopulation of problem drinkers experience a high rate of independent life events, stresses for which they are not directly responsible? This writer's conjecture is

that such a group exists and that their battle against overwhelming circumstances needs to be examined without prejudice.

Brown (1972) presents a model for researching just this issue. He and his colleagues (Brown, Harris, and Peto, 1973) have devised a means of assessing the causal link between life stress and resulting depression or schizophrenia. The method could be applied to problem drinkers. Oversimplifying the process somewhat, a baseline for independent events can be taken for the general population. A matched sample of problem drinkers could be interviewed and their experience of life change recorded. Using Brown's complex mathematical procedure, one can subtract out of the general life event impact from a more directly triggering influence over drinking behavior. Had we a general baseline of independent life event occurrence and carefully obtained event reports before the onset of heavy drinking, we could empirically differentiate the "noise" of general stress impact from a more formative, causal influence.

In summary, the life event experience of problem drinkers is an issue in need of considerable clarification. Data supports the idea that drinkers experience a high rate of life change. But our understanding of the variables which underlie this relationship is based on little more than conjecture and subjective impressions. We need better epidemiological evidence to assess whatever correlation there may be between stress and demographic factors such as social class, ethnicity, and religion. Further, we need to separate "dependent" from "independent" events to better understand the causal link between life change and problem drinking.

Rating of Event Impact

The present work found that problem drinkers tend to see life events as having a considerable impact on their drinking behavior. In fact, of nine items rated, drinking was seen as significantly more influenced by life stress than the other eight. This finding is at odds with that presented by Mules, et al. (1974). Mules, et al. asked 68 V.A. hospital alcoholics to rate the required readjustment of the 43 SRE events. Subjects perceived life events as requiring less readjustment than did the normative populations who provided standardized ratings.

There are several explanations for the discrepancy between this finding and the present one. First, the present study directed respondents to assess the impact of events on specific behaviors. Mules, et al. asked for a global rating of impact. As described in the present study, there was wide variability of rated impact on various behaviors. For example, subjects rated events as having practically no effect on their recreational life while rating the effect on drinking quite high. Mules, et al.'s global rating may disguise wide differences in perceived impact on more specific behaviors.

Secondly, the Mules, et al. subjects rated readjustment to all events on the inventory regardless of whether they had personal experience with them. The present research asked subjects to rate the impact of events which occurred in their lives. It is logical that persons who go through a life crisis will tend to rate their impact more highly (and perhaps more accurately) than those who must imagine the circumstances and responses surrounding an unexperienced stress.

Lastly, there are some methodological problems in the rating procedure of the present study. There may have been some confusion among subjects concerning the mechanics of answering the event impact scale. The maximum rating for impact of events was "5" above which was written "Great deal". The minimal rating was labeled "None". Several subjects came to the item "Amount you drink" and circled a "5" saying, "Yes, I drank a great deal." Although these subjects were re-instructed as to what circling "5" meant, and all subjects were carefully instructed before and during the checklist's administration, there is no way of knowing if any other subjects gave "5" as a rating of amount consumed rather than impact of events on amount consumed. Should a replication of this research be attempted, a revision of the rating scale's format is advised. The concept of stressful events' impact on behavior is a complex one and one which psychologically unsophisticated subjects may find cumbersome and confusing.

Amount of Drinking and Pattern of Consumption

The initial and most lasting impression one gets from the data on alcohol consumption is the extremely high volume of alcoholic beverages subjects were able to consume. Even allowing for some degree of exaggeration in self-reports, the quantities are astonishing and saddening. Subjects consumed an average of 159.78 pints of absolute alcohol yearly over the course of their drinking careers. Consider the financial expenditure this represents. In terms of one particular beverage, 160 pints equals 200 quarts of vodka. By purchasing the cheapest vodka in stock this is an investment of roughly \$800 per year. Even if \$800 re-

flects current inflationary prices, it is still more money than most lower socioeconomic persons can afford to use in the purchase of relaxation, socializing, escape, or for whatever other purpose alcohol may be used. Consider also the time which is spent in the allocation of money for drinking, obtaining the goods, and their consumption. The consumption of 24 cans of beer during 16 hours of waking life likely leaves little time for engaging in other life activities. Wiseman (1973) notes that alcohol rehabilitation efforts are often inadequate since they do not supplant sufficient activities during "sober time" for the consummatory behavior involved during the "drunk time". We can appreciate the truth of this.

Another factor largely unresearched in this regard and practically never considered in therapeutic regimens is the time a heavy drinker must spend in the bathroom. Empirical information on "bathroom time" awaits the researcher brave enough to challenge a socially taboo topic.

A provocative datum in the present research is the variability of consumption rates which preceded hospitalization. One subject admitted himself for help when he was consuming 84 pints of absolute alcohol yearly (approximately 6.11 drinks per day). Another subject was consuming 764 pints (55.59 drinks per day) before admission!

The drinker's social situation may account for much of this variance. The social situations of some heavy drinkers may be especially sensitive to the effects of drinking. A six-pack of beer consumed during lunch break is likely to detract far more from the work performance of a computer programmer than a longshoreman. Weekend drinking binges are likely to be seen in a more negative light in a middle class suburb than in

a center-city ghetto. Co-workers, employers, social friends, and family members all have important roles in identifying problem drinkers. Should these people unanimously consider the drinker a "sick person in need of help" the chances are greater that this person will be hospitalized than if these people consider the drinker a "good time Charlie". Indeed, the respondent who drank an average of 6.11 drinks was a school teacher living in an upper middle class neighborhood with a population of about 1,000. The extremely heavy drinker was an out-of-work carpenter living in a flop house in a city of roughly 90,000.

The patterning of alcohol consumption also requires further study. Subjects in the current research showed widely varied patterns of consumption. Drinking consistency scores indicated that while one subject reported no year in which his consumption decreased from the previous year, another subject decreased or maintained his lowered consumption during nearly half of his drinking career. One of the hypotheses proposed for the current research was thus supported, namely, that alcohol consumption reported by subjects reflects a fluctuating pattern incompatible with a disease conception of alcohol problems. This leads one to believe that a typology of consumption patterning is possible. Rather than assuming that all "alcoholics" increase or maintain their consumption level throughout their lifetimes, it is useful to think in terms of a continuum of consistency.

Once having typed drinkers according to their consistency of consumption, one needs to probe the causes for consistency or inconsistency. One possible mediating variable is situation sensitivity or self-monitoring. The concept of situation sensitivity has been raised by personality

researchers (e.g., Snyder & Monson, 1975) who are interested in the variables which moderate consistency of behavior across situations. Snyder and Monson present the idea that those persons who "monitor their behavioral choices on the basis of situational information demonstrate considerable situation-to-situation discriminativeness in their behavior" (p. 643). The behavior of high situationally sensitive persons is, therefore, best predicted by situational factors. Others, who rely more on internal states and cues are presumed to be more cross-situationally consistent. When applying this model to alcohol research we might propose that the fluctuating drinker who, by definition, shows more cross-situational variability than the consistent drinker, is more attuned to situational forces and adjusts his drinking behavior to them. The consistent drinker may rely more on internal information and, therefore, show less situational variability.

This dimension of consistency and situation sensitivity may be reflected both in longitudinal data and cross-situational data collected in one time period. It is assumed by most clinicians that some problem drinkers are selective in the settings they choose for heavy consumption. Some subjects in the current study stated emphatically that they never missed a day of work due to drinking and never drank on the job. Another drinker known to the author claimed he was totally abstinent for the forty days of Lent each year, but before and afterwards drank like a fish! It is an unanswered but provocative question whether differences in drinking patterns are influenced by the person's situational sensitivity.

The present results argue for the utility of further research into the consumption patterns of problem drinkers. Ironically, it is drinking behavior itself which has been omitted from most alcohol research (Rohan, 1975). This is quite understandable. Longitudinal data requires an enormous commitment in time and energy. Thus self-report measures represent weak but feasible and available sources of information. What is needed now is the development of research designs which include both self-report and direct observational data. These methods would provide empirical data to support or reject the progressive disease model of alcoholism.

One cannot assess the degree to which the self-report data in the current study corresponds with the actual behavior of the respondents. One interesting confounding factor is the possibility that self-reports were consciously or unconsciously reflecting the respondent's personal viewpoint on alcohol problems. It is conceivable that subjects who reported progressive patterns of consumption believed more strongly in a progressive disease concept (were Alcoholics Anonymous supporters?) than did those subjects reporting fluctuating patterns. Certainly this aspect of alcohol research needs further exploration with added controls for personal concepts of alcoholism.

Life Events Associated with Drinking Increases

High association event categories. The present findings lend support to the idea that life events have differential probabilities of eliciting maladaptive responses. It was found that unexpected events were more likely to be associated with drinking increases than were ex-

pected events. Further, exits from the social field had a significantly higher probability of association with drinking increases than entrance events.

Together, these findings indicate that events which are not forewarned and/or leave the drinker with diminished social support or social integration, are the most likely to elicit a drinking response. Neither result is particularly surprising. Cognitive theories of stress and coping behavior (e.g., Janis, 1958; Lazarus, 1966) hypothesize the use of ineffective or maladaptive coping activities among persons who have no previous information about a stressful situation. Anticipation of a major life crisis, whether it is for a happy or tragic event provides a person with time to mentally "run through" the adjustment required in the future. Expected events allow for the vicarious testing of alternative coping strategies, consultation with others who have survived similar stresses, and the concretization of plans for dealing with the imminent life change. Unforewarned stress places the individual at a disadvantage. Unprepared, the person may seek immediate relief from discomfort. Some persons may respond with a sense of being overwhelmed and helpless, and withdraw into clinical depression (Seligman, 1975). Other persons may seek the escape of intoxication and the withdrawal available in alcoholic amnesia. The findings presented here argue that the crisis of an unexpected event is more likely to elicit a less adaptive coping response (large consumption increases) than is an expected event.

We can also account for the high association of drinking increases with exit events. One of the most common ways of dealing with life change

is to involve significant others in the crisis. In whatever way they are relied upon, supportive others are vital for most persons who are adapting to stressful life circumstances. We are all acquainted with the relief friends and relatives provide when we are pressured: they offer us the support that "friends are for". But what happens when a life event involves losing one such support? Consider, for example, marital separation. This kind of stressful event involves not only a good deal of anger, disappointment, social disruption, etc., it is also likely to take away from each spouse the person typically relied upon in previous times of crisis. The person adapting to separation may feel helpless to improve things and a depressive reaction may occur. Paykel's work underscores the likelihood of this happening. Data from the present research shows that heavy drinking may also result. That exit events are associated with dramatic consumption increases lends credence to the importance of social support in meeting the challenges of living.

High association event items. The events which had the highest probability of association with drinking increase were: marital reconciliation, financial increase, divorce, and legal troubles. The events which had the lowest probabilities of association were: the birth of children, death of parents, death of relatives, and fired or laid off at work. To a degree these are surprising and puzzling results. The author anticipated that the events rated highest in stressfulness on the SRE (death of spouse, divorce, jail term, and marital separation) would have the highest probabilities of association. Two of these four events, divorce and legal troubles, were among the high probability events. Since death of a spouse was a non-occurring event in this sample it could hard-

ly show a high probability of association.

However, the frequent association of marital reconciliation and financial increase with drinking increases was not anticipated. First, both are positive events which one might assume are less stressful, and perhaps, less likely to require extensive coping efforts. Second, normative stressfulness ratings for the two events on the SRE (Hölmès & Masuda, 1974) are, respectively, 45 and 38 life change units. Those ratings place the events in the lower half of the SEI. In other words, one-half of the inventoried events are commonly considered to require more social readjustment.

Let us attempt to explain these findings separately. Marital reconciliation is an event which represents a complex change in social status. Returning to a spouse involves perhaps more trepidation and fear of failure than does an initial marriage. Spouses may feel a special stress associated with the now-tenuous marital bond and the possibility of a final marital break. Therefore, this apparently happy event may involve a high degree of covert tension (as opposed to the overt conflict involved in separation) and elicit escapist heavy drinking. It is also an event which may take many years for one to "get over". The hurt of separation and questions of maintaining the marriage tend to prolong a person's sense of readjustment and stress.

As with reconciliation, a sudden financial increase is a complex change in public status which may provide a source of covert stress. Financial betterment often precipitates added work responsibilities and new demands for material goods in the home. A spouse who feels unable to meet these new responsibilities may resort to heavy drinking. Cynic-

ally, added financial resources for a drinker may also translate into added intoxicating resources.

However, on balance it is difficult to present a coherent single-factor explanation for these results. What seems necessary is a replication of the findings to insure their reliability. At that point consideration should be given to multi-factor relationships.

These findings underscore the need for a typology of life events and life event contexts. Brown (1974) and Paykel (1974) argue persuasively that a full understanding of life stresses is impractical without an examination of the contexts in which they occur. Paykel suggests that expectedness and social exits are crucial dimensions to be considered. Brown offers the notion of long- vs. short-term threat to expand our appreciation of contextual variables. The current work presents a third: the degree to which the stressful event is self-induced.

In order to identify stress-respondent drinkers we must first be able to differentiate "independent" from "dependent" events. The designation of independence in this research has been on the basis of indirect evidence, for example, the assumption that the death of a relative cannot logically be traced to the subject's drinking. Future work might do better to ask the subject as well as his friends and relatives for their opinions as to the degree of self-induced stress. We may find that certain events are clearly self-induced, others are not, and still others are in a middle range. This knowledge would provide a necessary step in moving from a correlational level of relationship to a more causal relationship.

Stress, Drinking, and High Associators

As was anticipated, the number of life events reported correlated strongly with average alcohol consumption ($r = +.69$). This relationship accounts for nearly 48% of the variance in scores, and thus adds importance to the finding that problem drinkers as a group experience a high rate of stressful life change. We must note, though, that a good deal of the positive correlation drops out when one deletes dependent events. The correlation with independent events was $+.29$, accounting for roughly 8% of the variance. The meaning is clear: the degree of positive monotonic relationship between drinking and stress is heavily influenced by those events which can be considered the consequences of drinking. Although it is speculation at this point, the data for the whole group leads one to believe that heavy drinking is a more powerful factor in generating life stress than the other way around.

An anticipated trend for the current work was that a subpopulation of the sample, between one-quarter and one-third, would show a consistent association between life event occurrence and the onset of large drinking increases. The results do not provide a clear enough picture to provide confirmation of this trend.

We did find that four subjects had four or more associations and that these associations were not due merely to these drinkers reporting over longer time spans. This represents a consistent one-seventh of the sample which may be stress-respondent.

Demographic commonalities among the high associators lent support to the anticipated trend of lower socioeconomic status being related to

stress-respondent drinking. The high associators were slightly less educated than the zero associators and also had lower paying and more blue-collar jobs. However, the "high associators" also drank more than the others which, if you will excuse the pun, made them "higher" associators. One tends to see this difference as overriding any significant demographic differences. One other comparison produced negative results: high associators dated the impact of life events no higher than low associators. This is likely a methodological artifact since all respondents bunched their ratings at the high end of the scale. A 7-point scale (rather than a 5-point) might have produced better separation.

These negative findings may be due, of course, to the small and relatively homogeneous nature of the sample. One cannot expect to see startling demographic differences when comparing two groups of four men, especially when all eight originate from an ethnically and economically similar population. Future work may be better able to identify stress-respondent drinkers by sampling diverse populations, and certainly by obtaining larger samples.

Secondly, the present study used demographic variables principally because they are easily accessible data. They may, in fact, be inappropriate variables for the task of identifying stress-respondent drinkers. Fort and Porterfield (1961) noted wide differences in stress-related drinking among women based on a neuroticism dimension. This work was not replicated or expanded upon, but perhaps it is a fruitful direction for further research.

A final variable worth pursuing is the drinker's degree and percep-

tion of social integration. Antonovsky (1974) proposes several measures of social integration he calls "resistance resources". They are: 1) homeostatic flexibility (the capacity to perceive and accept many ways of coping); 2) social ties to friends, relatives, and co-workers; and, 3) ties to the total community (a sense of loyalty and involvement with one's surroundings). These are concepts which are far from a stage of quantitative measurement, but they are thought-provoking and cogent. Future endeavors to differentiate persons who adopt effective coping activities from those who adopt ineffective ones could well use these variables to meaningfully clarify the underlying process of coping. They seem to have intuitive value for future research on stress and drinking.

An Original Model of Stress and Drinking Behavior

So far this discussion has focused on explaining the quantitative findings in the present study. An attempt has been made to convey the meaning of the results by linking them to past findings or theories. This has had the effect of explaining bits and pieces of a large picture. While mini-theories are fine for exploring small corners of a discipline, their burgeoning number can effect a conceptual fragmentation of a process. In other words, the phenomena we seek to understand --- the inter-relationship of social stress and increased drinking --- may elude our understanding if we only attend to the parts and not to the whole.

The author's view is that the stress-drinking relationship is a systemic process which is influenced by a variety of situational and personality factors. The qualitative data of this study, with all their com-

plexity and confounding of variables are what have shaped this systemic viewpoint.¹

Piecing together the quantitative and qualitative findings of this study, the author's clinical experiences, and readings into the research and clinical literatures, the author has designed a systems model of stress and alcohol consumption.

Let us first examine the two explicitly stated models of life stress and behavioral outcome one finds in the literature. Then we can compare and contrast the present model with them.

Two models of life stress and behavioral outcome. Rahe (1974) proposes a model of life stress and illness. The model is a linear one in the sense that stress and its effects are conceived as proceeding in sequential steps before eliciting an illness response. Rahe uses the analogy of lenses and filters to illustrate his idea. "Light rays" of environmental stress move from left to right, passing through the person's "lenses" and "filters" of psychological defenses and coping styles which magnify, refract, or absorb the stress. If any rays are left they are projected on an "illness rule" which assesses the magnitude of the outcome illness and illness behavior. Let us examine this model in somewhat more detail.

Environmental stresses or life events are seen as the initial inputs, changes in the environment which are continuous but variable in

¹A friend once said, "Variables are not confounded; life is." To the extent that our research yields confounded (confounding?) and complex results we may say we are aware of real life.

intensity and frequency. This input is augmented or lessened by the individual's "polarizing filter" of past experiences. Some life events are magnified in personal importance because of memories and special sensitivities, while other life events are diminished in importance and influence. Next, the "negative lens" of psychological defenses helps to refract some of the penetrating stress. Repression or projection are seen as strategies which successfully divert or soften the effects of environmental stress. That which passes through the defense system effects physiological reactions. The person experiences some activation of internal processes whether they be changes in catecholamines, heart rate, digestive juices, or hormonal secretions. This physiological activation is then filtered through coping activities. The person may find ways to reduce the effects of the physiological reaction, but that which is not absorbed by this filtration process is reflected in illness and illness behaviors such as asking for medical assistance.

The Rahe model has several useful features and several notable omissions which need to be assessed. The model utilizes an effective analogy for describing stress and the human response to it. It is a model which highlights the human capacity to increase or decrease the impact of environmental stress through selective perception, defense mechanisms, physiological strength or weakness, and behavioral actions designed to cope with physiological distress. It succinctly defines the process Selye (1956) proposed in which disease is seen as the residual after coping mechanisms have operated to restore the organism to homeostatic balance.

The model is notably unappreciative of several important factors in

stress resolution. First, it does not include the influence of situational or interpersonal variables. Rahe proposes that all the forces which counteract life stress are inside the organism. It is common sense to assume that the effects of life change are vastly different for a person living in isolation and poverty than for a person for whom emotional and financial support are readily available. Human behavior cannot occur in an interpersonal vacuum; responses to stress are necessarily affected by the interpersonal milieu. The degree to which personal defenses and attributes account for one's coping ability is an empirical question open to research. It should not be assumed that they are all of the factors involved.

Second, the Rahe model is linear in nature. It seems to provide no feedback loop between the end-point (illness behavior) and the starting point (environmental stress). Yet this feedback phenomenon is evident in nearly all accounts of life event and illness occurrence. Getting sick, after all, precipitates a number of environmental changes --- reduced time at work, new financial expenditures for treatment, etc. Rahe's model of stress outcome does not take this into account. The seriousness of this omission is discussed later in this discussion section.

The second model (Cobb, 1974) is actually a borrowed and modified version of Kahn's (1973) conceptualization of stress, conflict, and role ambiguity. Cobb's model is also linear and is also primarily concerned with illness behavior. Unlike Rahe's model it is based on the examination of a single life event, job loss.

Cobb suggests that job loss is an event which precipitates some degree of objective stress. He leaves "objective stress" an entity which

is as yet unstudied. Cobb acknowledges that we have no measurement devices to objectively quantify the stress which a person experiences. There is, however, a plethora of data on subjective stress. For this variable, Cobb considers the person's sense of object loss, role ambiguity, responsibility, and work load essential in determining the degree of stress perceived. The greater the subjective stress the greater the strain on the individual. Strain is observable in three aspects --- physiological changes, affective changes and behavioral changes. An example of a physiological change might be an increase in epinephrine in the blood stream. Affective changes are reflected in increased feelings of hopelessness or desperation. Behavioral changes are exemplified by suicidal gestures or psychomotor retardation. Following the experience of subjective stress and strain, the individual may exhibit signs of illness which, in turn, lead to illness behaviors such as requests for medical assistance or hospitalization.

In Cobb's model all of these processes are influenced and mediated by personal characteristics and social situations. Cobb allows that an individual's capacity for immunity from stress rests partially on the person's coping skills, defense mechanisms, psychological needs, and genetic endowments. But unlike Rahe, he sees situational variables as important factors. Cobb includes in his model the impact of social support, the attitudes of peers and professionals, and the person's current life situation. Although these factors are left fuzzily defined or undefined (what a "current life situation" entails is left undefined), their inclusion in a model of stress and stress outcome behavior is a

major asset to our understanding of the process.

However, Cobb, too, presents a linear model. Stress causes illness. There is no allowance that illness may, in turn, cause stress. In fact, the linearity of both models fails to question the utility of causal notions about stress and stress response. If a feedback loop is inserted into these models, there is a circularity of effect which makes the assumption of this-causes-that invalid.

There are other problems with Cobb's model. There is no allowance given to the possible positive or adaptive effects of stress and illness behavior. It is assumed that life events produce crisis, disruption, and discomfort. It is not necessary to assume that all of the affective or behavioral responses to life change need be negative. It is conceivable that a job loss also results in a reassessment of vocational goals, added time to be with family members, and feelings of relief that a bad situation has ended. Even an illness and hospitalization may have positive effects. The illness may elicit attention from family members and friends, a new awareness of the person's body, a growth-inducing realization of mortality.²

Second, Cobb fails to include the unique effects of person-situation interactions. A response to stress is likely to be influenced not only by personal characteristics alone or by social situational factors alone, but by the fit of one with the other as well. Without acknowledging this

²Stewart Alsop's account of his bout with leukemia, Stay of Execution (1973) is an excellent illustration of the complexity of positive and negative consequences related to illness and hospitalization.

phenomenon, models of stress and behavior are lacking an important conceptual and predictive ingredient.

A model of stress and alcohol consumption. At this point in our discussion it may be clear to the reader that a new model is necessary to adequately conceptualize the complexity of the stress-drinking relationship. The new model needs to take into account both the person variables and situational variables which influence stress-respondent behavior. Further, it must include a feedback system to reflect the circularity of the stress-response-new stress cycle. These ideas, as well as some others, are developed in the model of stress and alcohol consumption described below.

Before detailing the features of this model and its theoretical or practical implication, several of its conceptual limitations will be presented. First, this is a model applicable only to those persons or situations which we have called "associators". The rich body of literature on alcohol problems (as well as some results of the present study) makes it clear that stressful events are not the sole cause of problem drinking. A host of other factors better explain the drinking behavior of many people. It should be clearly understood, then, that the model proposed does not assume to conceptualize all heavy drinking for all persons. The model is a mini-model of problem drinking in that it focuses on that subpopulation of drinkers who seem to increase their consumption in temporal coincidence with life changes.

Second, the model cannot coherently incorporate all of the social and personal factors which relate to drinking under stress. As we have said, the research evidence on the issue of stress-respondent drinking

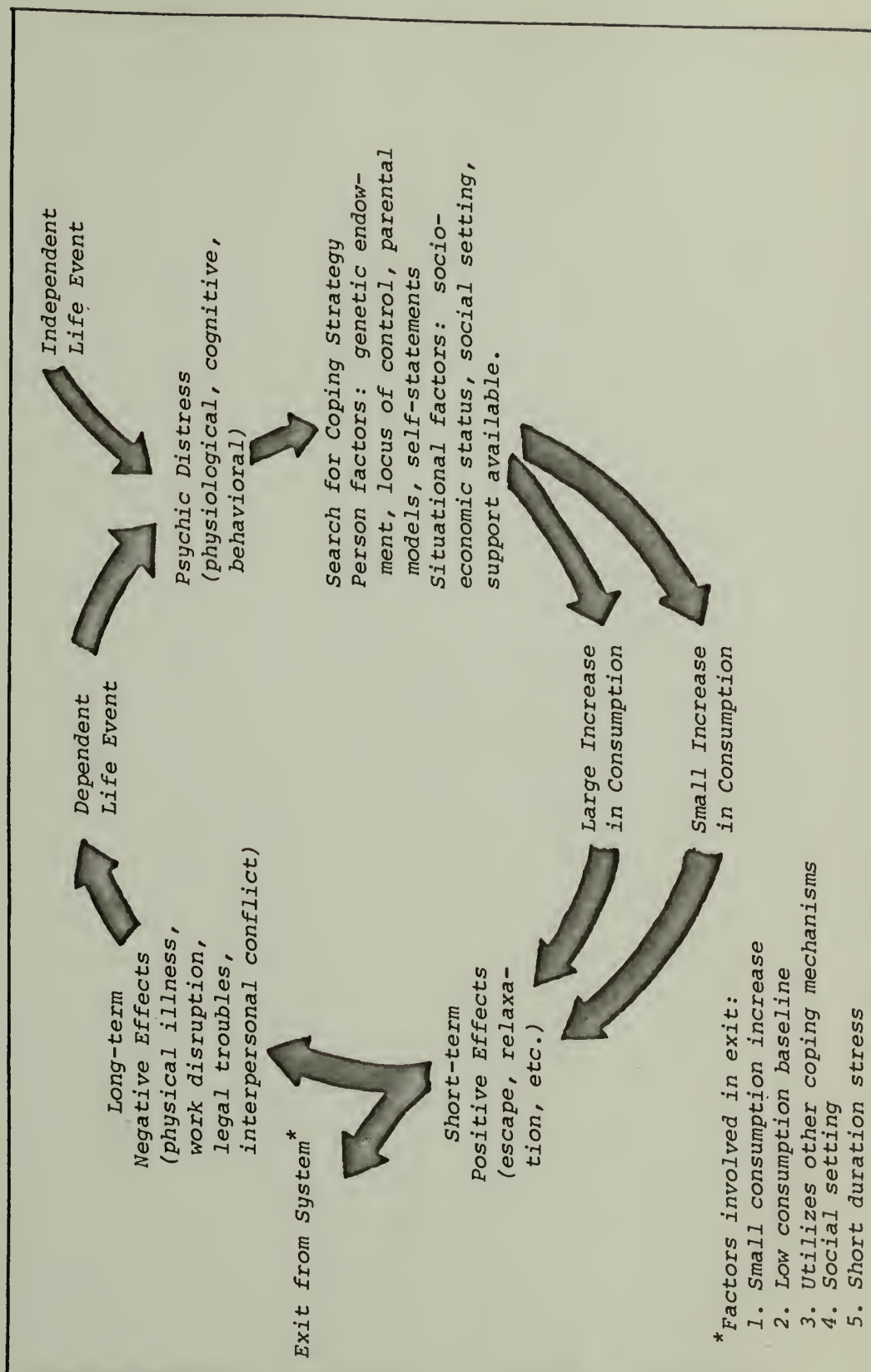
is slight and disconnected. Therefore, the model presented here attends to those person and situation variables which, from the results of the present research and the author's clinical experience, provide a reasonable first step toward a richer conceptualization of stress and drinking.

With that as preface, let us examine the model. As a first point, it differs radically from previous formulations by being circular and systemic in nature rather than linear and causal. A graphic schema for the model is presented in Figure 5. The sequence of occurrences in the model proceeds in a clockwise direction as the arrows indicate. The arrows should be read to mean "may lead to". For example, the experience of a dependent life event may lead to psychic distress. While the major portion of the model is a cyclical system, independent life events represent a point of entry into the system. Let us go through a cycle of the stress-drinking model.

Suppose, for example, that a person's child is discovered to have a heart defect which requires life-threatening and financially depleting open heart surgery. For the parents this represents an independent life event since its occurrence had nothing to do with drinking behavior. The crisis of the child's illness would rather naturally lead to the parent feeling some degree of psychic distress. This distress may involve physiological, cognitive, and behavioral changes.

If the distress is severe enough, as it is likely to be with the event presented, the person will seek some form of coping activity. This search for a coping strategy may be either a conscious or unconscious process. From a nearly infinite number of coping strategies, our dis-

FIGURE 5
A Model of Stress and Drinking Behavior



tressed parent may respond by increasing his alcohol intake. If the increase is a large one, the person is likely to feel some immediate beneficial effects. These may be physiological (reduced tension, more restful sleep), or psychological (escape from difficult decisions or interpersonal situations, feelings of relief, improved affect and conviviality). However, if the consumption is great enough, there are likely to be long-term negative consequences for drinking. Intoxication may produce a rather long list of punishing effects including social disfavor, job warnings or firings, physiological discomforts such as gastritis, hangover, and nausea, and legal troubles, to name a few.³ These long-term effects may then trigger another stressful life event. This time the stressor is a dependent event since drinking helped formulate the problem.

The above gives a brief example of how stress can trigger drinking and how drinking can generate added stress. This is the crux of the argument underlying a circular, systemic model of stress and drinking. However, readers who consult Figure 5 again will note that there is an arrow which points away from the circle at the stage of "short-term positive effects". The notion that arrow conveys is as follows. We can theorize that when consumption increase is not particularly large and/or when the duration of a stressful time is relatively brief, drinking behavior may stop short of incurring long-term negative consequences. In effect, if the drinking increase and stressful circumstances are relative-

³One must also acknowledge that some of the short term effects of heavy drinking may elicit negative consequences and life events.

ly innocuous, drinking may prove to be an adaptive coping strategy. The person can exit the system before cycling through dependent events and renewed needs for anxiety-reducing drinking. This, in brief, is the model for stress and drinking. There are numerous sub-units to the model, so let us go back to elaborate them. A good place to start is with the stressful event whether it is independent or dependent.

The type of stress-inducing event must be put into the equation. Evidence from past studies and the present one indicates that unexpected events elicit more maladaptive coping responses than expected events. The chances of a drinking increase are significantly greater when the precipitating stress is unexpected than when expected. Further, events in which an important person leaves the social field have a higher likelihood of being associated with drinking increases than entrance events. Finally, those events which are most stressful and enduring were found to be associated with drinking increases, namely divorce and legal troubles. Even the puzzling finding that sudden financial increase and marital reconciliation were highly associated with drinking increases logically finds its place in the model. Sudden financial increases, such as money willed by relatives, may be unexpected occurrences with long-term effects. Marital reconciliation, while perhaps more likely to be expected, represents a social change with very long duration qualities.

Regardless of type or quality of a stressful event, it is likely to generate psychic distress in the person who experiences it. As we said before, this discomfort has three aspects --- physiological, cognitive, and behavioral.

Our parent of the sick child is likely to experience increased arousal and muscle tension, perhaps sleeplessness, nausea, or other physiolog-

ical symptoms of anxiety. Cognitively, the parent may be preoccupied with thoughts of the child's death, possible inadequate financial resources, disruptions to family, work and social routines, etc. The person's behavior is also likely to indicate distress --- hand-wringing, pacing, quick irritability --- although the patterning of individuals' distressed behavior is largely idiosyncratic.

Given the event (a situational process) and these feelings of psychic distress (a personal process), the parent will now seek, at some level, an effective coping strategy.

A number of critical factors influence the search for a coping strategy. Four factors are clearly individual or personality variables:

1) genetic endowment; 2) locus of control orientation; 3) parental models for stress management; and, 4) self-statements. Genetic endowment plays a mediating role in determining the degree of autonomic arousal the individual experiences. For example, persons whose arousal level and metabolic rate are typically low may respond with fewer worrisome physiological changes when stressed. They are less likely to perceive a need for a drastic coping strategy to offset their psychic distress. More specific to the issue of drinking, some people seem to have a physiological aversion to alcohol. These may be genetic factors which cause these individuals to become nauseated after drinking alcoholic beverages. Thus, they are far less likely to use alcohol as a means of coping than others for whom alcohol produces relaxation.

Locus of control is another crucial variable. Persons with internal orientations expect sources of reinforcement to come from their own actions. Externals, conversely, assume that reinforcement comes from out-

side themselves, that fate, luck, or circumstance control their actions. (Rotter, 1966). These differences in control orientation may have a profound effect on the coping strategy a person chooses. Internals may be expected to rely on their own actions to get them out of tough situations. They may be more likely to confront a stressful situation and deal directly with it. The extreme external may be more likely to feel overwhelmed by a stressful event. Believing that external events control behavior, the external may perceive his or her actions as futile, energy-wasting gestures. The externally-oriented person may be prone to choose a coping strategy which evades the stressful situation. If internals are likely to stand and fight, externals are likely to flee and escape.

Parental models of stress-management are also important factors in the coping process. The child who grows up seeing parents systematically deal with problem situations may adopt similar means of problem-solving as an adult. Another child, seeing his parents responding to situational difficulties by drinking heavily may adopt that pattern for himself when placed under stress. Rouse, Waller, and Ewing (1973) present some evidence to support this contention. Adolescents whose fathers were heavy drinkers reported using significantly fewer coping strategies than did adolescents whose fathers were moderate drinkers or abstainers. More importantly, the children of heavy drinkers adopted coping strategies which were socially isolating --- solitary activities, trying to forget, and smoking --- in much the same way their parents chose an isolating means of coping (heavy drinking). Children of heavy drinking fathers did not drink more than other adolescents but they were

significantly more likely to drink at home and associate with friends who were heavy drinkers.⁴

The fourth person variable influencing the search for a coping strategy is the self-statements that the person makes to himself or herself. What a person says sub-verbally has a considerable impact on the person's behavior and affect (Meichenbaum and Cameron, 1974). Suppose, for example, the hypothetical parent whose child needs a heart operation makes the following statements: "I can't handle this situation! What can I do? It's out of my hands. I just feel like going out and getting ripping drunk. What I need now is a good stiff drink to settle me down." We can expect that this parent has a relatively high likelihood of adopting an escapist or avoidant strategy. The self-statements will reinforce the person's perception that drinking can help one feel better. An alternative set of self-statements might lead to a different set of coping behaviors. For example, these self-statements: "I can do more for my child and myself if I just keep my head. I can relax myself and cool down so I'm thinking straight. OK, now what do I have to do to solve the problem?" may lead to less avoidance, anxiety, and drinking, and more proactive behaviors.

So far, our description of stress response has addressed itself to person variables. There are, however, a number of situational factors

⁴ The Rouse, et al. (1973) paper does not identify the ways in which heavy drinking parents used alcohol. We do not know what proportion of the parents used alcohol as a means of coping with stress. Subsequent research on this issue might prove beneficial in identifying students who model inadequate coping styles and who could use more constructive methods of coping.

which influence the selection of a coping strategy. Evidence from the present study indicates that socioeconomic status is one such factor. The lower socioeconomic person experiences higher rates of life change; he also shows a higher incidence of drinking increases. Financial resources apparently influence not only the likelihood of stress occurring but the means a person may use to contend with it. Drinking may be the poor man's tranquilizer or vacation in Miami.

The setting in which one chooses a coping strategy is also likely to have a profound effect on the decision process. Some neighborhoods or work environments encourage heavy drinking as a coping mechanism. Other communities punish community members who drink to relieve psychic pain. Urban ghettos often epitomize the former; there drinking is an accepted and time-honored way to deaden the pains of living with stress.⁵ Mormon or fundamentalist Baptist communities exemplify the latter; in these settings, religious activities are far more likely to be chosen as coping strategies than heavy drinking.

Social support represents a third situational factor. Consider, again, our parent of a sick child. Should this parent be a single parent or a person with a limited network of concerned others, the coping options available to him or her are drastically reduced. We commonly rely on others in times of challenge or crisis; without the support and feedback of others the decision-making process for coping can become an

⁵Oscar Lewis' *La vida* (1966) gives a detailed picture of this in a Puerto Rican ghetto; *Talley's corner* (Liebow, 1967) provides another example in a poor black community.

autistic one. Lacking interpersonal involvement, the solitary behaviors of worrying, drinking, and drug-taking are more probable. In short, the chances of choosing chemical support as a coping mechanism are inversely proportional to the availability of interpersonal support.

To continue with our description of the model, let us assume a person increases his consumption level greatly. The alcohol will provide some short-term positive effects, namely, muscle relaxation, escape from the stressful situation, and lightened affect. It is important to see this stage in the process as an adaptive step. Conceivably, our distraught parent was unable to function when under acute psychic distress. If once crippled by anxiety and feelings of incompetence, our parent, after drinking, feels less anxious and more competent, then so much the better. Alcohol's short-term benefits may provide an individual with a more comfortable internal environment from which to capably handle a crisis.

At this point in the model we allow room for the person to exit the system. Exit following short-term benefits constitutes an essentially successful use of alcohol as a coping strategy. As was true in the search for a coping strategy, both personal and situational factors influence whether an exit from the system occurs. The person factors include the degree of consumption increase, the person's baseline of previous consumption, the degree to which the person utilized other coping mechanisms.

If the consumption increase is a large one, a system exit is less likely than if the increase is small. Obviously, large quantities of alcohol are bound to precipitate the negative physiological effects of

hangover, nausea, gastric problems, and, if large enough, physical addiction. Importantly, if the drinking increase represents a vast departure from previous behavior, there are likely to be added negative effects of interpersonal conflict and censure at work and in the family circle.

The person's pre-stress drinking rate has an added, though overlapping, effect. The light drinker who increases consumption moderately has less chance of developing the physical problems, and work or legal conflicts than the person who already drank heavily. On the other hand, the individual with a low drinking baseline has little leeway for a drinking increase which will not incur the wrath of both his body and his social milieu.

Lastly, a person who uses other coping mechanisms in addition to drinking may exit from the system easier than the one who uses drinking exclusively. Returning to our example parent, suppose he not only drinks but also becomes a more active and compassionate father to the child. The strength and optimism he might show when with the child may offset the scorn and discomfort relatives and friends might feel when they see him drinking.

This leads to a discussion of the social milieu in which the drinking behavior occurs. As part of an established social system, a person's drinking behavior may be punished, reinforced, or ignored.

It would seem that both the strongly negative and strongly positive cultures may foster the completion of the stress-drinking cycle. Strongly negative cultures such as religious groups sworn to abstinence punish

the drinker so forcefully and thoroughly that negative effects are felt almost automatically. Once having broken the code of abstinent behavior the drinker may become an outcast, certainly a situation which precipitates psychic distress and the need for more alcohol. Cultures which reinforce stress-respondent drinking will be less likely to censure the drinking, of course, and will foster additional increases. It is outside agents (police and employers, especially) who may give the heavy drinker considerable trouble, generating dependent life events. It would seem that cultures in which drinking has a low valence --- either positive or negative --- are most amenable to the drinker exiting the system after successfully coping with stress.

A final important factor, of course, is the severity and duration of the stressor one copes with. A protracted illness and recovery for our sick child may correspond with a protracted use of alcohol by the coping parent. On the other hand, should a second doctor's opinion prove correct --- that the child is not seriously threatened and can be treated with medication --- the likelihood is great that father can slow or stop his drinking.

In summary, both personal and social factors influence 1) the coping strategy search process; 2) the adoption of drinking as a coping strategy; 3) whether or not long-term negative effects will follow the short-term benefits of drinking; and, inevitably, 4) whether once a person has gotten into the stress-drinking cycle he can exit the system.

Clinical and theoretical implications. The results of this study and the model proposed have far-reaching implications for future research

and clinical work in the alcohol field. The complexity of the model precludes an assessment of all the research paths which might be taken using it as a basis. Similarly, clinicians with varied orientations will use these thoughts in widely differing ways. It is possible, however, to summarize four important points which are highlighted by the current research.

1. Researchers and clinicians need to be aware that the interrelationship of stress and drinking is a circular one. It seems pointless to look for a unitary cause of drinking behavior. Just as pointless is the conception that drinking is an outcome of stress which does not feed back into the social system. The idea that life events, coping, and alcohol consumption follow each other around in a circle has implications for the clinician who seeks to assess a drinker and his problems. All too frequently, a clinician will place responsibility for drinking problems at only one point in the circle. Suppose, for instance, the clinician assigns responsibility for the problem to the drinker's lack of motivation to stop. This assignation implies two things: 1) that if it were not for the person's motivational deficit the problem would disappear; and, 2) that the process of drinking somehow begins with and ends with the drinker. By declaring the drinker's motivation to be "at fault" the clinician has also made an arbitrary punctuation of the system. This idea of punctuation needs some explanation. If a process is seen with a systems-eye view the notion that "this-causes-that" becomes relatively unimportant. What is important is conceptualizing events as additive and interrelated. The wife nags, the husband drinks, the wife nags. Who caused the drinking? If we assign the wife to be at fault (if only she

stops nagging, he'll stop drinking) we have arbitrarily punctuated the system and declared: the drinking problem starts with her.

By making our model of stress and alcohol consumption circular, the act of arbitrary punctuation becomes a good deal more blatant. One does not know where to begin with a circular process, and that makes problem-solving harder. However, the act of punctuating systems phenomena (and thereby discounting the essential interrelatedness of things) is something which needs to be considered and discouraged. We cannot afford to conceptualize complex processes in linear, simplistic models just because they make solutions easier to find.

2. Alcohol use may be an adaptive coping mechanism. The vast majority of literature on alcohol abuse accents the negative consequences of drinking. Writers and clinicians endlessly describe "alcoholism" as a self-destructive, maladaptive syndrome. Drinkers with high recidivism at alcohol treatment programs often complain that they've heard all the bad news about cirrhosis and brain damage before; what they want to know is how to stop. The suggestion here is that they might best understand their drinking if they assess what they get from drinking. Davis, et al. (1975) hold similar unpopular views. They emphasize that the aversive dysphoria, hangover, and interpersonal conflict associated with drinking "will not necessarily make the overall experience of drinking aversive" (p. 210). They maintain that to be effective in treating alcohol problems one must concentrate on the adaptive (though undesirable) consequences of drinking, and offer the drinker alternative means of gaining adaptive consequences without drinking.

When a person uses alcohol to relieve a sense of psychic distress, the immediate effects are positive and adaptive. It is the long-term consequence of alcohol which is self-destructive, negative and maladaptive. The model presented here makes that sequence clear, and implies that some persons who increase their intake when stressed may exit the system rather than develop a progressive disease called "alcoholism".

3. Situational variables have a profound influence on all aspects of the stress-drinking relationship. Of these situational variables, socioeconomic status (SES), the type of life experience, and the availability of social support appear to be especially salient.

Socioeconomic conditions imply a great deal about a person's chances of experiencing stressful life change as Dohrenwend (1973b) and the present study indicate. Second, SES largely governs the individual's financial capacity to cope with stresses. The poor man who cannot afford legal counsel has far less "going for him" when confronted with a criminal charge than the wealthy man. The same can be said concerning medical problems and job disruptions --- the poor cannot pay for the agents who get wealthy people out of those jams. Lower socioeconomic status also implies that drinking may be the coping response chosen since vacations, therapy, legal aid, or tranquilizers may be too expensive to use with any regularity.

The type of life event which occurs, of course, relates to degree of stress experienced and the response an individual adopts. Current data indicate that unexpected and exit-type events are most likely to trigger a drinking response. Divorce, marital reconciliation, sudden

financial increases, and legal troubles are also high-risk events. Should these findings be replicated, they provide an excellent opportunity for preventive efforts against maladaptive stress-respondent drinking. For example, employers who give a sudden and significant raise to an employee (and with it significantly greater responsibilities) might monitor that person's work behavior closely for signs of heavier drinking.

The availability of social support is a third factor far less researched than it deserves. We are simply too uneducated concerning the processes by which persons in need rely on friends, relatives, and others in the community. Clinicians are particularly prone to deny the importance of support systems when their clients are experiencing psychic distress. As mentioned earlier, exit events involve more than social readjustment; they represent the disruption of important social supports. For the stress-respondent drinker, alcohol and social contacts in taverns may be attempts to supplant the strengths usually drawn from supportive social networks. One intervention idea comes to mind: perhaps instead of treating the mind of the problem drinker (as is common in traditional therapies), a more effective change might be reconstituting a stagnant or fragmented social network. For example, consider a man who has left a job in which he had many co-workers for a solitary job. Under the stress of a job change and lacking social contacts, the man begins drinking heavily. It may be easier to alter the drinking behavior by getting the man a new, socially connected job than by encouraging him to accept his lonely job. These are options too frequently ignored.

4. Many of the personality factors which go into choosing alcohol as a coping strategy can be redirected toward more effective strategies through stress-innocation training. The way one copes with stress has a good deal to do with one's perceptions, self-statements, and behaviors. When one chooses drinking as a coping mechanism the perceptions may be that the stress is overwhelming; the self-statements may reinforce a sense of incompetence and impotence; and the behaviors may involve anxiety and avoidance of the stressful situation. Michenbaum and Turk (1976) present a therapy designed specifically to teach stress responses more adaptive than depression or anxiety. They call the therapy "stress-innocation training" since its intent is to provide clients with role-played and in vivo stress experiences so they can face real life stresses more capably. Therapy highlights the importance of unlearning negative self-statements and learning more adaptive self-statements.

This therapy's goal of teaching new self-statements seems particularly important and meaningful for our present discussion. It implies that stress-respondent drinkers might change their choice of coping strategy were they to cognitively reshape their perceptions. Does the stress-respondent drinker escape from stressful situations because he or she catastrophizes things, self-verbalizing negative thoughts and the need for escape? Clinical research on this issue could provide significant knowledge implying the applicability of stress-innocation training for problem drinkers. It seems to the author that stress-innocation training might be an effective therapy for those problem drinkers whom we have labeled "associators".

In summary, there are many ways to use and expand upon the findings and conception presented here. The research evidence can best be seen as heuristic and exploratory --- after all, how many generalizations can be made from a sample of 28 male problem drinkers? The model offered can best be appreciated as an initial prod to students of alcohol problems for better thinking, better researching, and better clinical interventions concerning stress-related problem drinking.

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APPENDIX A

_____ (Subject Number)	_____ (Birthdate)	_____ (Marital Status)
_____ (Occupation)	_____ (Educ. level)	_____ (Religious affiliation)
_____ (Ethnic background)	strong (ethnic identification)	moderate weak
_____ (Current residence)	city	suburban rural
_____ (Hometown)	city	suburban rural

STRESSFUL EVENTS INVENTORY

Date of entry into military service_____

Date of discharge from military service_____

EVENTS

DATE

 EXPECTED?
 Yes No

1. Marriage

 2. Birth of 1st child
 other children

 3. Physical illness or injury
 to self

 4. Illness or injury to
 family member(s)

EVENTS	DATE	EXPECTED?	
		Yes	No
5. Death of parents close relatives close friends			
6. Death of wife			
7. Separation from wife			
8. Reconciliation with wife			
9. Divorce from wife			
10. Major financial change (increase or decrease)			
11. Fired or laid off at work			
12. Imprisonment or major legal troubles			
13. Other events you feel have been important in your adult life			

Some researchers at the University of Massachusetts are interested in the major events that occur in people's lives. We are especially interested in how important these life events are for different people.

For each statement below please circle the number which best shows the impact that the life events you have listed before had on the nine items shown below.

TO WHAT EXTENT WOULD YOU SAY THAT THE LIFE EVENTS YOU LISTED HAVE, IN GENERAL, AFFECTED:

	Not at all		Some		Great deal
1. Your ability to work	1	2	3	4	5
2. Your recreational life	1	2	3	4	5
3. The amount you smoke	1	2	3	4	5
4. The amount you drink	1	2	3	4	5
5. The amount you eat	1	2	3	4	5
6. Your relationships with friends	1	2	3	4	5
7. Your relationships with family	1	2	3	4	5
8. Your health	1	2	3	4	5
9. Your general happiness	1	2	3	4	5

Thanks for your cooperation.

APPENDIX B

<i>Subject Number</i>	<i>Age of First Drinking</i>	<i>Years of Drinking</i>	<i>Total Pints</i>	<i>Average Rate</i>	<i>Number of Increases</i>
01	14	31	3335	104.2	4
02	15	18	1631	90.6	1
03	17	21	2811	133.9	2
04	16	24	2125	88.5	3
05	16	14	1783	127.3	3
06	15	21	2076	98.9	0
07	12	18	6052	336.2	6
08	17	25	4828	193.1	7
09	18	26	9222	354.7	8
10	17	11	897	81.5	3
11	15	20	3409	170.5	4
12	19	23	3287	142.9	4
13	17	8	1189	139.8	3
14	18	24	4633	193.0	5
15	16	29	3336	113.1	3
16	18	28	3618	131.6	5
17	18	13	1022	75.7	1
19	9	21	8008	381.3	8
20	16	29	3258	110.5	4
22	17	28	6372	220.0	4
23	18	24	1536	64.0	2
24	19	22	1682	76.0	2

<i>Subject Number</i>	<i>Age of First Drinking</i>	<i>Years of Drinking</i>	<i>Total Pints</i>	<i>Average Rate</i>	<i>Number of Increases</i>
25	15	30	5752	186.0	2
26	18	12	1798	149.9	3
27	17	28	2615	90.2	3
28	16	27	4467	165.4	2
29	16	29	7840	270.3	5
30	16	21	3878	184.7	2

