DOCUMENT RESUME

ED 270 655 CG 019 108

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TITLE Change and Stability in Maximum Annual Alcohol Consumption and Alcohol-Related Problems among Aging Males: A 19-Year Follow-Up Study.
PUB DATE Apr 86
NOTE 20p.; Paper presented at the National Council on Alcohol (San Francisco, CA, April 18-21, 1986).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Aging (Individuals); *Alcoholism; Behavior Patterns; *Drinking; Followup Studies; *Longitudinal Studies; Males; *Older Adults

ABSTRACT

Research has consistently shown that among the non-institutionalized elderly, prevalence rates of heavy alcohol use and problem drinking are relatively small in comparison to younger age groups. This study examines how maximum annual alcohol consumption and problem drinking change as a concomitant of the aging process. This study of alcohol-use habits of the elderly helps to complete the understanding of how drinking styles evolve across the life span. A subsample (N=85) of 246 males who were first interviewed as a part of a random household drinking study in 1964 were reinterviewed 19 years later. The results revealed that decreases in drinking were likely to occur at the heavier levels of maximum number of drinks taken on a single occasion during the past year by the men in the longitudinal sample. Among the men who changed their drinking patterns, decrease was 8.6 times more likely to occur than increase. Of the men who had experienced at least one alcohol-related problem prior to 1964, one-half reported having at least one such problem during the follow-up period. Initiation of problem drinking among some men who did not report alcohol-related problems in 1964 was an unusual pattern. Despite limitations of this study, the findings are useful in interpreting the much-replicated cross-sectional finding of a decrease in problem drinking and heavy consumption during the latter part of the life course. (ABL)

"Change and Stability in Maximum Annual Alcohol Consumption and Alcohol-Related Problems Among Aging Males: A 19-year Follow-up Study"

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Paper read at the 1986 National Council on Alcohol, "Alcohol and the Family", April 18-21, 1986, San Francisco, CA

Abstract

This paper describes how maximum annual alcohol consumption and problem drinking change as a concomitant of the aging process. Findings are based on a 19 year follow-up of a sub-sample of San Francisco (California) white males, first interviewed as part of a random household drinking survey of that city in 1964. Decreases were likely to occur at the heavier levels of maximum annual event drinking. Of the men who had experienced at least one alcohol-related problem prior to 1964, half had at least one such problem during the follow-up period. Initiation of problem drinking among those men who did not have alcohol-related problems at Time 1 was an unusual pattern. These findings are useful in interpreting the much-replicated cross-sectional finding of a decrease in problem drinking and heavy consumption during the latter part of the life course.

Introduction

The study of how drinking patterns change or stay the same as individuals move towards old age has become a topic of growing interest to scholars interested in alcohol studies, and is the subject of a small but growing literature. Cross-sectional research has consistently shown that among the non-institutionalized elderly, prevalence rates for heavy alcohol use and problem drinking are relatively small in comparison to younger age strata (1-4). The few long-term prospective data sets which have measured changes in alcohol consumption among cohorts entering old age have found considerable stability in typical alcohol consumption at light and moderate levels of use, with decreases at the heavier levels of use (5-6). This finding, in combination with the cross-sectional data, suggests that if individuals moderate alcohol consumption during later life, this moderation occurs most frequently among those who drink at the most extreme and problematical levels. Yet, little attention has been given to the exploration of how the heaviest or most extreme drinking styles change as a concomitant of the aging process. This paper will address this topic by describing changes in maximum annual consumption and continuity of alcohol-related problems through the analysis of a 19-year prospective data set.

Consideration of how those who drink at the heaviest and most problematical levels change their drinking styles across the life course holds important theoretical and health policy implications. Although the elderly are not characterized by high problem drinking prevalence rates, the study of drinking behaviors among the elderly holds considerable interest to theory in the alcohol field if they are regarded as the culmination of a lifetime's drinking habits. That is, study of the alcohol use habits of those in later life helps complete understandings of how drinking styles evolve across the entire life course. Also relevent to a life-course perspective on alcohol use is the

question of whether problematic drinking styles are a cumulative, progressive phenomenon or whether such drinking styles are given to "spontaneous remission" as problematic drinkers mature (7-9). Such understandings could contribute to the description not only of the "natural history" of problematic drinking styles, but also of the natural history of drinking itself. Furthermore, the study of how individuals bring extreme or problematic drinking styles into old age has direct health policy implications. Research which determines how often such styles are brought into or develop in old age will help health care planners determine whether the problem drinking segments of cohorts approaching old age are likely to make unprecedented and burdensome demands for health care services. In addition, determination of the differences between those drinkers who manifest alcohol-related problems in old age and those seniors who do not may assist in the design of effective prevention strategies.

Methodology

The methodology for this research project has been described elsewhere (6,10), nonetheless, central points concerning the research design will be emphasized here for readers' convenience. A subsample of males who were first interviewed as part of a random household sample of San Francisco adults in 1964 (n=246) was reinterviewed 19 years later. The 1964 San Francisco study was itself in large part a reinterview effort based on an earlier 1962 San Francisco study. For the 1964 reinterview, heavy drinkers were proportionately over-sampled. The resulting over-representation of heavy drinkers for the 1983 sampling frame constitutes the primary methodological variation from a typical prospective community study of drinking habits. These men were aged 30-69 in 1964 and the modal age range for the 1983 follow-up was 59-68, with the majority of the sample (67%) over the age of 60. Upon follow-up, 85 (35%) of the original 246 respondents in the sub-sample were successfully reinterviewed, and another 79 (31%) were known to be deceased in 1983. Despite this modest reinterview rate, only age (due

to the loss of the older respondents to death) and education (due to the inordinate loss of men with less than a high school education) were significantly different between the 85 men who were successfully reinterviewed and the entire 1964 sub-sample.

The same measure for maximum annual alcohol consumption was employed in 1983 as in 1964. Maximum annual alcohol consumption was measured by asking respondents to remember back over the previous year and state how many drinks they had on the occasion when they had the most to drink.

Some changes were unavoidable in the readministration of the problem drinking scale. The problems that were measured at both time periods included binge drinking, having a hangover, complaints from wives, complaints from friends, trouble on the job due to drinking, arrests for drunk driving, other legal trouble due to drinking, and feelings on the respondent's part that he should cut down on drinking. Although these problem drinking measures were administered in 1964, most of these items measured only lifetime prevalence of such problems (e.g. measured whether certain common alcohol-related problems ever happened to the individual). This procedure could not be repeated in 1983 since it would be unclear whether respondents were answering positively due to an alcohol-related incident which occurred prior to the first measurement. It was therefore decided upon follow-up in 1983 to measure whether the set of alcohol-related problems had occurred during the previous year. The fact that the follow-up measure defines a shorter time period than did the original measure places limits on what can be said regarding remission from problematic drinking styles, although not on continuity or increase in the number of such problems.

Findings

A consistent format will be followed in presenting the findings concerning change and stability over time for maximum annual quantity and the set of alcohol-related problems. First are the aggregate analyses which compare the prevalence of specific

drinking behaviors in 1964 to 1983 and which also pay particular attention to the possible effects of loss to follow-up bias. Second are the analyses of individual stability and change, in which incidence, remission and stability in behavior are described.

For the purposes of the presentation, it is important to clarify the differences between the "two" 1964 samples described in the prevalence tables. The 1964a sample (n=246) consists of all the white males interviewed in 1964 between the ages of 30 and 69; the 1964b sample (n=85) is a subset of the former which includes those men who were also reinterviewed in 1983. Comparison of the 1964a and 1964b samples allows consideration of the possible effects of loss to follow-up bias. The 1964b and 1983 samples will be referred to collectively as the "longitudinal" or the "follow-up" sample.

MAXIMUM ANNUAL ALCOHOL CONSUMPTION

Analysis of Loss To Follow-Up Bias

In Table 1 the frequency distribution for the maximum number of drinks taken on one occasion during the past year for the years 1964 and 1983 are presented. When drinking levels are collapsed into larger categories, the differences between specific drinking levels become minimal, as indicated by the underlined percentages in Table 1. It does not appear that loss to follow-up bias is of any great importance in the analysis of this variable. A chi-square test of difference between the 1964a and 1964b samples was not significant.

Maximum alcohol consumption levels 1-3 will be referred to here for the purposes of discussion as the "heavy event drinkers", levels 4 and 5 as the "moderate event drinkers", and levels 6 and 7 as the "light event drinkers". These collapsed categories will form the basis of much of the discussion which follows concerning changes in maximum annual alcohol consumption.

TABLE 1: MAXIMUM ANNUAL ALCOHOL CONSUMPTION, 1964 AND 1983 IN PERCENTAGES

	1964a	1964b	1983
1. 12 or more drinks	21.1	14.1	1.2
2. 10-11 drinks	7.7	9.4	5.9
3. 8-9 drinks	8.9	11.8	7.1
	37.7%	35.3%	14.2%
4. 6-7 drinks	18.7	15.3	17.6
5. 4-5 drinks	19.5	23.5	18.8
	38.2%	38.8%	36.4%
6. 2-3 drinks	14.2	16.5	29.4
7. Less than 2 drinks	9.8	9.4	20.0
	24.0%	25.9%	49.4%
TOTAL N=	246	85	85

Maximum Annual Alcohol Consumption Within the Longitudinal Sample

Comparison of the 1964b and 1983 proportions of maximum alcohol consumption levels reveals that the greatest change occurred at the heaviest levels of use. As can be seen in Table 1, the men in this sample were 2.5 times less likely to have taken 8 or more drinks on a specific occasion in 1983 as they had been in 1964. Little change in the proportion of moderate event drinking is evident (1.1 times more likely to be at the moderate event drinking level in 1964). However, important change appears to have occurred at the lightest event drinking level: men were .5 times as likely to have only taken 3 or less drinks as a maximum quantity in 1964 as in 1983. That is, men were nearly twice as likely to be among the light event drinkers in 1983 as in 1964.

Patterns of Individual Change and Stability in Maximum Annual Drinking

In Table 2 individual change in maximum event drinking within the longitudinal sample are summarized. The proportions of individuals within the longitudinal sample who were either stable (the underlined figures in Table 2) or changed maximum annual alcohol consumption are described in this table. Change and stability is measured by both the corner percentages (the percentage of the entire sample in each cell) and row percentages (the percentage of the right-to-left row totals in each cell). The advantage of the corner percentage is that it allows computation of the proportion of the entire sample that moved in a particular direction; row percentages measure proportionate change and stability controlling for the original drinking levels.

As can be seen from the underlined diagonal corner percentages in Table 2, slightly over half (51%) of the longitudinal sample were stable in maximum quantity during the past year. Only 5% of the sample increased maximum event drinking while 43.5% of the sample decreased. Men who changed maximum annual consumption

were thus 8.6 times more likely to decrease than to increase. A test of change between the 1964 and 1983 samples was highly significant (matched t-test= -5.31, significance=.000).[2]

When we turn our attention to the row percentage figures, we can see that chronicity of heaviest annual consumption varied according to the Time 1 level of maximum alcohol consumption. Nearly all (86%) of the Time 1 light event drinkers remained at that level upon follow-up, whiie nearly half (45%) of the moderate event drinkers remained at that level at Time 2. Another half (49%) of the Time 1 moderate event drinkers became light event drinkers by Time 2. The heavy event drinkers were less predictable: nearly a third (30%) remained at that level upon follow-up, about half (47%) became moderate event drinkers and nearly a fourth (23%) became light event drinkers. Taken together these figures indicate that the dominant movement was towards decrease, rather than chronicity, among the heavy event drinkers as they aged.

TABLE 2: CHANGE IN MAXIMUM ANNUAL ALCOHOL CONSUMPTION; LONGITUDINAL SAMPLE; Corner and Row Percentages

Corner % Row %	1983 MAXIMUM QUANTITY			
	Light	Moderate	Heavy	TOTAL
1964b MAXIMUM QUANTITY				
Light	22% 86%	2% 9%	1% 5%	25% 100%
Moderate	19% 49%	18% 45%	2% 6%	39% 100%
Heavy	8% 23%	17% 47%	11% 30%	36% 100%

ALCOHOL-RELATED PROBLEMS

Analysis of Loss to Follow-up Bias

In Table 3 the frequency distributions for number of alcohol-related problems previous to 1964 and during 1983 are presented. As was the case with maximum quantity, when specific frequency levels are collapsed into the underlined larger categories, differences between these categories become negligible. Since differences between the 1964a and 1964b distributions are minor, as indicated by the underlined percentage figures in Table 3, it appears that bias introduced by loss to follow-up is not an important consideration in the analysis of this variable. A chi-square test of independence between the 1964a and 1964b samples was not significant. These categories will serve as the basis for much of the following discussion.

TABLE 3: NUMBER OF ALCOHOL-RELATED PROBLEMS, 1964 AND 1983 FREQUENCY DISTRIBUTIONS IN PERCENTAGES

	1964a	1964b	1983
No Problems	30.1	30.6	60.0
	30.1	30.6	60.0
One Problem	27.6	25.9	15.3
	27.6	25.9	15.3
Two Problems	17.9	21.2	17.6
Three Problems	11.0	16.5	3.5
Four Problems	4.9	3.5	3.5
Five Problems	5.7	1.2	0
Six Problems	.8	0	0
Seven Problems	1.6	1.2	0
Eight Problems	.4	0	0
	42.3	43.6	24.6
TOTAL N=	246	85	85

Change in Alcohol-Related Problems Within the Longitudinal Sample

Although a comparison of the collapsed 1964b and 1983 figures seems to indicate that important changes in the number of alcohol-related problems occurred over the 19 year follow-up period, this conclusion is not warrented due to the unavoidable change in the time period of measurement at follow-up. Nonetheless, the 1983 data do hold some interest as a measure of the prevalence of alcohol-related problems. It is immediately apparent in Table 3 that the majority of these men did not experience any alcohol-related problems during the previous year, while another 15 percent had only one problem. Perhaps the most surprising finding is that 40% of the sample reported having experienced at least one alcohol-related

problem during the year previous to the reinterview. However, this finding may be explained in part by the inclusion of "feeling that you should cut down" as a problem.

Patterns of Individual Change and Stability in Alcohol-Related Problems

In Table 4 the relationship between the number of alcohol-related problems during 1983 and previous to 1964 is described. The percentage figures describe the proportion of individuals who have changed or been stable in number of drinking problems while controlling for the Time 1 number of problems. That is, these percentages are useful in determining whether the Time 1 lifetime prevalence of number of drinking problems predicts the Time 2 number of problems. It can be seen that those men having no problems previous to 1964 were highly unlikely to experience alcohol-related problems during the year of follow-up. Those who only had one problem were less predictable: 9% reported experiencing one problem while an additional 23% reported having experienced two or more problems during the year of follow-up. In other words, among those who had experienced one problem previous to 1964, about a third reported experiencing at least one alcohol-related problem during 1983. Of the individuals who reported having experienced two or more problems previous to 1964, 38% experienced two or more such problems during the follow-up period and 65% reported having at least one such problem. A bit of recomputation of the Table 4 figures reveals that having had at least one alcohol-related problem previous to 1964 placed the drinker at 5 times the risk of having an alcohol-related problem during the follow-up year than those who had not experienced an alcohol problem previous to 1964 (e.g. comparison of the proportion of men continuous for at least one problem upon follow-up with the proportion of men reporting no problems previous to 1964, but who had at least one problem upon follow-up).

TABLE 4: CHANGE IN THE NUMBER OF ALCOHOL-RELATED PROBLEMS; LONGITUDINAL SAMPLE; ROW PERCENTAGES, N=85

	1983 Problems			
	No Problems	1 Problem	2 Problems	TOTAL
1964b Problems				
No Problems	89	4	8	100
1 Problem	68	9	23	100
2 Problems	35	27	38	100

Discussion

The goal of this paper has been to shed some light on how two of the more extreme forms of alcohol-related behaviors, maximum annual alcohol consumption and problem drinking, change in conjunction with the aging process. Yet before the findings of this research can be interpreted certain important limitations of this study must be acknowledged. These limitations include: 1) the longitudinal sample consists of solely of white males who were all residents of a major California city in 1964, 2) the sample size upon follow-up was small thus making it impossible to control carefully for age and other variables, 3) heavy drinkers were over-represented in the 1964 sampling frame, 4) important changes in the problem drinking measures were necessary upon follow-up, and 5) bias was introduced in 1983 due to the inordinate loss of older men and men with less than a high school education. Despite these important limitations, this is the first general population sample followed into later life and the findings from this follow-up can serve at least an exploratory function from which subsequent research might benefit.

It is clear that important decreases were made at the heavier levels of maximum number of drinks taken on a single occasion during the past year by the men in the longitudinal sample. The proportion of men drinking at the heaviest levels was 2.5 times greater in 1964 than in 1983; the proportion of men drinking at the lightest drinking levels was nearly twice as high in 1983 as in 1964. Furthermore, 70% of the men who were drinking at the heaviest event levels had decreased to moderate or light levels upon follow-up. Despite these important decreases, half of the men in this sample were generally stable in maximum annual alcohol consumption, due primarily to continuity among the light and moderate drinkers. Among the men who changed, however, decrease was 8.6 times more likely to occur than increase. Although the incidence of drinking at the heaviest event levels was somewhat rare among the men in this sample, it did occur: 3% of the sample had taken up drinking at the heaviest event levels who had not done so by 1964.

Conclusions regarding decreases in the number of alcohol-related problems are more difficult to make, due to unavoidable changes in the time frame of the follow-up instrument. The most conservative conclusions to be drawn from this data concern the prediction of problem drinking upon follow-up. That is, these data show that if men had not experienced an alcohol related problem before 1964, they were highly unlikely to have an alcohol-related problem during the follow-up year. Among the men who had experienced at least one alcohol-related problem prior to 1964, 50% had at least one such problem upon follow-up. Of the men who had experienced two or more problems prior to 1964, 38% had at least two such problems during 1983. Having had at least one alcohol-related problem prior to 1964 placed respondents at 5 times the risk of having another alcohol-related problem during the follow-up year than those who had not had a problem prior to 1964.

An accompanying analysis of changes in quantity and frequency of alcohol use within this same sample indicated that the primary changes in drinking behavior

which occurred over the years were concentrated among those who drank at the heavier quantity levels (6). The data reported here also seem to indicate that if changes in alcohol consumption occur in conjunction with the aging process they most typically occur among those individuals who typically drink at the heaviest event drinking levels and/or who manifest the most number of alcohol-related problems. Despite the limitations in the problem drinking data introduced during follow-up, it is clear that only a minority of the men in this sample were chronic or incident for such problems upon follow-up. Whether this apparent reduction in number of alcohol-related problems is due to differential time periods of measurement or to a genuine modification in drinking styles with age is a question of central importance for other long term prospective research projects.

It appears that about a third of the men in this sample exhibited chronicity in heavy event drinking. A similar proportion of these men were chronic for having at least one alcohol-related problem. The existent literature suggests that an important percentage of those who drink problematically in old age have brought such problems into old age from earlier periods of their lives. Large scale prospective designs can be used to determine the distinctive characteristics of those who are chronic for problem drinking and heavy consumption across the latter half of life. This sort of problem focus would help to identify those at greatest risk for continued problem drinking in later life and so contribute to the design of effective intervention and prevention campaigns.

Although an unusual behavioral pattern, some men had begun drinking at the heaviest event levels or problematically by the follow-up period who were not drinking in this manner at Time 1. Again, determining the differences between such men and those who do not begin to drink problematically as they aged is a question of great theoretical and policy interest.

Finally, it should be pointed out that prospective data hold important implications in the interpretation of the alcohol and aging literature. The retrospective literature has tended to emphasize the study of older problem drinkers, especially those who start to drink problematically in later life while the cross-sectional literature has tended to emphasize the reduction in the prevalence of problem drinking and heavy consumption during the final decades of life. The long-term prospective literature, however, has tended to emphasize the stability of drinking behaviors in the face of the aging process (5,6). However, from the few long-term prospective data sets currently available, it can be determined that, while somewhat rare, some men do begin to drink problematically as they enter old age. Further, while it is true that men at the lower consumption levels are generally stable in their alcohol intake as they enter old age, men at the heavy levels of use are not likely to exhibit chronicity as they age. Both of these findings provide independent replication of the dominant concerns of the retrospective and cross-sectional literatures. It is to be hoped that prospective data sets will continue to be used in the attempt to resolve puzzles which emerge in the study of changing patterns of alcohol use across the life course.

Notes

1. Financial assistance to conduct this research was provided by the National Institue on Alcohol Abuse and Alcoholism (AA 05173-01/02) and the National Institute on Aging (AG 00045-07). The author would also like to thank certain individuals for their critiques of earlier drafts of this paper. These include Drs. Joan Ablon, Colleen Johnson and Corinne Nydegger of the Medical Anthropology Program, University of California, San Francisco and Drs. Mike Hilton, Robin Room and Mark Temple of the Alcohol Research Group, Medical Research Institute of San Francisco.

2. All of the tests of difference reported in this paper employed uncollapsed categories. The maximum quantity variable was treated as a numerical-level variable; tests of difference for the same hypothesis which employed a non-parametric statistic (Wilcoxon matched pairs test) generated equivalent results for both the tests of difference for maximum event drinking variable and the number of problems associated with drinking.

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