



Published in final edited form as:

Drug Alcohol Depend. 2010 July 1; 110(1-2): 101–107. doi:10.1016/j.drugalcdep.2010.02.008.

Quitting Smoking and Change in Alcohol Consumption in the International Tobacco Control (ITC) Four Country Survey

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Abstract

Although frequent heavy drinking has been associated with decreased odds of quitting smoking, the extent to which smoking cessation is associated with decreased alcohol consumption is less clear. The present study examined over a 2-year period whether individuals who quit smoking for at least 6 months, compared to those making a quit attempt but continuing to smoke and to those not making any attempt to quit smoking, showed greater reductions in drinking frequency, average weekly quantity of alcohol consumption, and frequency of heavy drinking. Data were drawn from the International Tobacco Control Four Country Survey, a prospective cohort study of smokers in Australia, Canada, the UK, and the US. A total of 3,614 participants provided alcohol data at one study wave and were re-interviewed 2 years later regarding smoking and alcohol use. Consistent with prior studies, individuals who drank heavily (4+/5+ drinks for women and men, respectively) more than once a week had especially low rates of quitting smoking. There was little evidence, however, that those who achieved sustained smoking cessation made greater reductions in drinking compared to those who continued to smoke. These results were consistent across countries and sexes and did not differ significantly by heaviness of smoking. Results indicate that quitting smoking, in and of itself, does not lead to meaningful changes in alcohol use. Therefore, interventions and policies directed towards increasing smoking cessation are unlikely to affect rates of hazardous drinking unless they include specific elements that address alcohol consumption.

Keywords

Alcohol use; smoking; smoking cessation; heavy drinking

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1. Introduction

Cigarette smokers drink alcohol more often and more heavily than nonsmokers (Anthony and Echeagaray-Wagner, 2000; Chiolero et al., 2006; Dawson, 2000; Falk et al., 2006; Kahler et al., 2008b; McKee et al., 2007), and smoking and heavy drinking combine to produce especially negative effects on health (Breitling et al., 2009; Durazzo et al., 2006; Ebbert et al., 2005; Meyerhoff et al., 2006; Pelucchi et al., 2006; Schroder et al., 2002). The alcohol-smoking association is of high concern because a number of longitudinal community studies have shown that greater alcohol use is associated with decreased odds of smoking cessation (Augustson et al., 2008; Dollar et al., 2009; Hymowitz et al., 1997; Osler et al., 1999; Sorlie and Kannel, 1990). In-depth analysis of specific parameters of drinking behavior indicate that it is frequency of heavy drinking, as opposed to drinking frequency or average quantity of consumption, that is most strongly associated with low smoking cessation rates (Dawson, 2000; Kahler et al., 2009).

Although higher levels of drinking predict decreased odds of smoking cessation, there has been less evidence regarding whether individuals who quit smoking make meaningful reductions in their alcohol use. An 18-year longitudinal study of men found no significant association between smoking cessation and changes in alcohol use over time (Gordon and Doyle, 1986), while a 16-year longitudinal study of male veterans yielded equivocal results (Carmelli et al., 1993). In a community-level intervention study, Nothwehr and colleagues (1995) found that those who quit smoking did not reduce their drinking significantly more than those who continued to smoke. Likewise, quitting smoking was not associated with significant reductions in drinking in the Winnipeg Health and Drinking Survey (Murray et al., 2002). These results from community studies are consistent with clinical studies showing that smoking cessation interventions do not affect alcohol use (Fox et al., 1987; Murray et al., 1996), that change in drinking is not associated with smoking cessation treatment outcomes (Hughes and Oliveto, 1993; Kahler et al., 2008a), and that brief interventions to reduce drinking do not appear to reduce cigarette smoking (McCambridge and Jenkins, 2008). However, most longitudinal community studies to date have examined only total quantity of alcohol consumed (e.g., drinks per day) with the exception of Murray et al. (2002), which also assessed frequency of drinking to self-reported intoxication.

Given that frequent heavy drinking is most strongly associated with smoking cessation outcome (Dawson, 2000; Kahler et al., 2009), it also may be the aspect of drinking behavior that is most likely to change following smoking cessation. In a 20-year longitudinal study, quitting smoking in a given follow-up was associated with reduced risk of heavy drinking (Karlman et al., 2006). These results demonstrate the potential importance of examining different aspects of drinking behavior when examining changes associated with quitting smoking. However, given the inconsistency of findings across studies, more research in this area is needed.

The purpose of the present study was to examine longitudinally whether quitting smoking is associated with decreased alcohol consumption in community samples. Data were drawn from the International Tobacco Control Four Country survey (ITC-4), a prospective cohort study of smokers in Australia, Canada, the UK, and the US. Indices of alcohol use and smoking cessation status were examined at Wave 6 of the survey among those who completed the Wave 4 survey two years prior. We first tested the hypothesis that greater frequency of heavy drinking at Wave 4 would prospectively predict reduced odds of sustained smoking cessation for more than 6 months at Wave 6. This analysis sought to extend our prior findings on shorter-term smoking cessation (1 month or longer) at Wave 5, which indicated that drinking heavily more than once a week predicted a lower odds of smoking cessation (Kahler et al., 2009).

We then conducted analyses of change in drinking from Wave 4 to Wave 6, which extended previous research by testing three aspects of drinking behavior: frequency of drinking, average weekly quantity of alcohol consumption, and frequency of heavy drinking. We hypothesized that individual who quit smoking would show significantly greater reductions in heavy drinking frequency than individuals who made no attempt to quit. We also extended previous work in this area by examining whether individuals who made quit smoking attempts but returned to smoking made greater reductions in drinking than those who did not make a quit attempt. In addition, we tested whether the associations between quitting smoking and change in alcohol consumption differed by country or by sex given the potential role of sociocultural factors (Bobo and Husten, 2000) and sex (Sorlie and Kannel, 1990) in these associations. Finally, we examined whether heaviness of smoking and frequency of smoking (daily vs. non-daily) moderated the effects of quitting smoking on drinking behavior. We hypothesized that non-daily smokers would show greater changes in drinking after quitting smoking because their smoking is particularly likely to occur in the context of heavy drinking (Harrison et al., 2008).

2. Method

Data analyzed in this paper came from the fourth, fifth, and sixth waves of ITC-4. ITC-4 involves annual telephone surveys with representative samples of adult smokers (18 years of age and older) with replenishment each year to maintain country sample size at 2000 or more. A full description of the ITC 4-country survey can be found elsewhere (Fong et al., 2006; Thompson et al., 2006). The Wave 4 ITC-4 survey was conducted between September 2005 and January 2006, Wave 5 between September 2006 and January 2007, and Wave 6 survey between September 2007 and January 2008. Questions on alcohol consumption were incorporated into the Wave 4 survey and repeated at Wave 6. Of the 8105 Wave 4 respondents, 7018 were current smokers at Wave 4, of whom all but 18 (0.3%) provided alcohol use data. Of these 7000 smokers, only those assessed at Wave 5 (69.0% of the Wave 4 sample) were recontacted at Wave 6. In total, 3614 individuals (51.6% of Wave 4 participants) had smoking status assessed at Wave 6; analyses are restricted to these participants. Among them, 941 were in Canada, 773 were in the U.S., 915 were in the U.K. and 985 were in Australia. Rates of completion of Wave 6 differed significantly by country: 53.1% in Canada, 43.2% in the U.S., 53.0% in the U.K. and 57.5% in Australia. Those completing follow-up were significantly more likely to be white/English-only and were older than those not completing the Wave 6 follow-up. Frequency of heavy drinking at Wave 4 showed a significant negative linear association with completion rate, whereas drinking frequency and average weekly alcohol consumption did not. Of those never drinking heavily, 54.4% completed Wave 6 compared to 44.9% of those drinking heavily more than once a week. The weighted proportion of the analyzed sample that was female was 46.8%, and the weighted mean age of recruitment into the study was 41.9 (SD = 16.7). Of these smokers, 95.8% were daily smokers, and the weighted mean heaviness of smoking index score (see below for details) was 2.59 (SD = 1.59).

2.1. Alcohol Use

Alcohol use over the past 12 months was assessed at Wave 4 and 6 with 3 questions that queried drinking frequency, number of drinks consumed on a typical drinking day and heavy or “binge” drinking frequency, defined as drinking 4 or more (for women) or 5 or more (for men) drinks in a 2-hour period (Kahler et al., 2009). Consistent with our prior study and to retain an adequate portion of the sample (at least ~5%) in each category, drinking frequency was collapsed into 6 levels for analysis purposes: never, less than once a month, 1-3 days per month, 1-2 days per week, 3-4 days per week, and 5 or more days per week. Heavy drinking frequency was collapsed into 5 levels: never, less than once a month, 1-3 days per month, once a week, and more than once a week. Drinking frequency and typical drinking quantity were multiplied to form a

weekly alcohol consumption variable, which was divided into 5 non-overlapping levels: no drinking; light drinking (some drinking but <3 drinks per week); moderate drinking (3-7 drinks per week for women, 3-14 drinks for men); heavy drinking with the lower-bound based on NIAAA guidelines (National Institute on Alcohol Abuse and Alcoholism, 2005); >7-14 drinks per week for women, >14-21 drinks per week for men); and very heavy drinking (>14 drinks per week for women; >21 drinks per week for men).

2.2. Relevant Covariates

For these analyses, we included three demographic variables as potentially important covariates given that these were significantly associated with frequent heavy drinking in this sample: age, sex, and country (Australia, Canada, the UK, or the US) (Kahler et al., 2009). Two smoking-related variables shown to be robust predictors of quitting behavior also were covaried: the heaviness of smoking index (HSI), which is a composite of the number of cigarettes smoked per day (coded: 0: 0-10 cigarettes per day [CPD], 1: 11-20 CPD, 2: 21-30 CPD, 3: 31+ CPD) and time to first cigarette (coded: 0: 61+ minutes, 1: 31-60 minutes, 2: 6-30 minutes, 3: 5 minutes or less), and intention to quit, which is categorized in 4 levels (plan to quit in next month, plan to quit in next 6 months, plan to quit beyond 6 months, and no plans to quit).

2.3. Outcome Measures

The smoking outcomes assessed in this study were making a quit smoking attempt between Wave 4 and Wave 6 (i.e., at least 1 attempt vs. no attempts) and current sustained quit attempt at Wave 6 (i.e., currently quit for more than 6 months vs. still smoking). All data were based on self-report and were not subject to biochemical validation. We selected individuals at Wave 4 who were current smokers defined as having smoked at least 100 cigarettes in their lifetime and currently smoking on at least a monthly basis. A subject was defined as having made an attempt if they reported a quit attempt at either Wave 5 or Wave 6. Individuals were defined as quit if they reported at Wave 6 that they had currently quit smoking for longer than 6 months at the time of the survey (9.5% of the weighted follow-up sample). Of those quit for longer than 6 months, about half (51.5%) had been quit for more than 12 months. Participants who reported having quit within the past 6 months (1.9% of the weighted follow-up sample) were not included in analyses of quitting as their status on this variable was uncertain. We also examined the proportion of the sample who had made a quit attempt and who had remained quit at the time of Wave 6.

Drinking outcomes were assessed at Wave 6 in the same manner as at Wave 4. The drinking frequency, average weekly quantity, and heavy drinking frequency categories described above were calculated at Wave 6. In addition, to ease presentation and interpretation of results, individuals were classified on each of these three variables according to whether their drinking had increased (gone up at least one categorical level), remained at the same categorical level, or decreased (gone down at least one categorical level).

2.4. Analysis Plan

2.4.1. Long-term quitting behavior—To examine the prospective association between drinking at Wave 4 and quitting smoking at Wave 6, we examined bivariate associations between the three drinking variables at Wave 4 and the three smoking cessation behavior variables at Wave 6 (sustained quit attempt at Wave 6, attempted to quit, and the proportion of those making an attempt who had sustained quitting at Wave 6). We conducted weighted logistic regression analyses to determine the significance of each of these associations using an alpha level of .05. These analyses were conducted using PROC SURVEYLOGISTIC in SAS, which provides appropriate corrections for significance tests when weighted data are used. The weights used in these analyses were the Wave 4 cross-sectional survey weights

adjusted within geographic strata and age-sex groups to account for attrition between Wave 4 and Wave 6. In order to control for potential third variables that might account for the associations between alcohol use and smoking, our primary analyses also controlled for country, sex, age, HSI and intention to quit. Analyses also were repeated without sample weights; results remained unchanged in terms of significance levels with a few exceptions noted below.

Alcohol use outcomes: We first examined the stability of drinking behavior from Wave 4 to Wave 6 by examining the association between drinking level at Wave 4 and classification of drinking at Wave 6 as either decreased, stable, or increased. We also calculated the rank-order correlations for each drinking index between Wave 4 and Wave 6. We then examined bivariate associations between quitting smoking and change in drinking. For these analyses, smoking status at Wave 6 was classified into three categories: no quit attempts between Wave 4 and Wave 6, made a quit attempt between Wave 4 and 6 but was smoking at Wave 6, and having quit smoking for more than 6 months at Wave 6. Participants who reported having quit within the past 6 months at Wave 6 (1.9% of the weighted follow-up sample) were not included in these analyses as it is unclear how their recent quitting behavior might impact their reports of drinking over the past year. We ran weighted ordered logistic regression analyses predicting change in drinking (decreased, stable, or increased) with Wave 6 smoking status as the independent variable, which was dummy-coded using quit smoking at Wave 6 as the reference group. In our primary analysis, we included the level of the respective drinking variable at Wave 4, country, sex, age, HSI, and intent to quit as covariates. These analyses were repeated using unweighted models. Finally, we ran weighted ordered logistic regression analyses predicting each drinking variable at Wave 6, controlling for the Wave 4 value of the respective variable and including smoking status at Wave 6 as a predictor along with country, sex, age, HSI, and intention to quit smoking. Finally, we tested the interactions between smoking status and country, sex, HSI, and daily vs. non-daily smoking.

3. Results

3.1. Quitting Behaviors by Drinking Index

The second column of Table 1 shows the frequency distribution for each drinking variable. The third through the fifth columns of Table 1 show the weighted frequency distributions of quitting smoking variables by each level of drinking. Drinking frequency and average weekly quantity of consumption were not significantly associated any quitting variables when covarying country, sex, age, HSI, and intention to quit at Wave 4.

Covarying country, sex, age, HSI, and intention to quit at Wave 4, those drinking heavily more than once a week at Wave 4 had significantly lower odds of having quit smoking for more than 6 months at Wave 6 than those never drinking heavily (adjusted odds ratio [AOR] = 0.38, 95% confidence interval [CI] = 0.17- 0.84), those drinking heavily less than once a month (AOR = 0.43, 95% CI = 0.19- 0.96), and those drinking heavily once a week (AOR = 0.29, 95% CI = 0.11- 0.77); the contrast between drinking heavily more than once a week and drinking heavily 1-3 days per month approached significance (AOR = 0.44, 95% CI = 0.18- 1.10, $p = .08$) in the weighted model and was significant in the unweighted model.

Heavy drinking frequency also was significantly associated with quit attempts. When covarying country, sex, age, HSI, and intent to quit, those drinking heavily more than once a week were less likely to make a quit attempt than those drinking heavily one day a week (AOR = 0.52, 95% CI = 0.28- 0.95). In unweighted analyses, drinking heavily more than once a week was associated with significantly lower odds of making a quit attempt than all other heavy drinking categories. The association between heavy drinking frequency and sustaining a quit attempt among those who made an attempt was nonsignificant.

3.2. Change in Drinking by Drinking Index

Spearman rank-order correlations between Wave 4 and Wave 6 indicated high stability for drinking frequency ($r_s = .79$), and weekly quantity ($r_s = .74$), with somewhat less stability in heavy drinking frequency over time ($r_s = .53$), $p_s < .0001$. Columns 6-8 in Table 1 show the weighted proportions of participants in each drinking category at Wave 4 whose drinking decreased, remained stable, or increased at Wave 6. It is important to note that by definition those in the lowest drinking category at Wave 4 could not be classified as decreased at Wave 6, and that those in the highest category at Wave 4 could not be classified as increased at Wave 6.

3.3. Associations between Wave 6 Smoking Status and Change in Drinking

Column 2 of Table 2 shows the numbers of participants classified as (a) not making a quit attempt between Waves 4 and 6, (b) making a quit attempt but still smoking at Wave 6, and (c) having a sustained quit of 6 months or longer at Wave 6.¹ Columns 3-9 show the weighted proportion of participants within each smoking status category whose drinking decreased, remained stable, or increased. The only significant bivariate association between smoking status and change in drinking was for heavy drinking frequency. However, this association was nonsignificant when controlling for country, sex, age, HSI, and intention to quit smoking.

Results of weighted ordered logistic regression analyses of drinking frequency, weekly quantity, and heavy drinking frequency at Wave 6 indicated that smoking status was not significantly associated with Wave 6 drinking when controlling for the respective variable at Wave 4, country, sex, age, HSI, and intention to quit smoking. In separate analyses, we tested interactions between smoking status and country, sex, and Wave 4 HSI. We also tested the interaction between smoking status and Wave 4 daily smoking status (daily vs. non-daily smoking) by adding a term for daily smoking in the model along with its interaction with smoking status. In all cases, interactions were nonsignificant. The rank-order correlations between daily smoking and drinking variables and between HSI and drinking variables were significantly negative but very low (r_s s ranging from $-.04$ to $-.08$), indicating that multicollinearity between drinking and smoking at Wave 4 was minimal and was unlikely to be affecting results obtained.

3.4. Exploratory Analysis of Extended Non-Smoking and Change in Drinking

Given the limited associations between quitting and change in drinking, we also examined data from individuals who had already quit smoking at Wave 4. Specifically, we examined change in drinking among individuals who reported having quit smoking at Wave 4 and who remained non-smokers at Wave 6 ($n = 395$). Weighted ordered logistic regression analyses indicated that these individuals did not differ significantly from the other smoking status groups examined above on any alcohol consumption variable at Wave 6 when controlling for Wave 4 drinking. Thus, sustained smoking cessation of more than 2 years did not predict change in drinking relative to continued smoking or to more recent smoking cessation.

4. Discussion

Frequent heavy drinking of more than once a week predicted low odds of sustained smoking cessation at a 2-year follow-up, extending our previous work with this sample (Kahler et al., 2009). Heavy drinking's association with quitting did not differ significantly across countries

¹As an alternative means of coding smoking status, we classified participants as (a) not smoking at all in the 12 months prior to Wave 6 (6.0% of the weighted sample), (b) made a quit attempt but smoked at any point in the 12 months prior to Wave 6 (37.3% of the weighted sample), and (c) did not make a quit attempt in the past 12 months (56.7% of the weighted sample). Results were not meaningfully different from those obtained with our primary coding of smoking status.

and sexes. These results are consistent with recent findings from smoking cessation treatment studies that indicate that the risk of smoking relapse is especially high on days in which heavy drinking occurs (Kahler et al., 2005; Leeman et al., 2008), perhaps reflecting alcohol's disinhibiting effects at high levels of consumption or alcohol's ability to enhance attention to immediate and salient environmental cues (MacDonald et al., 2000a; MacDonald et al., 2000b), such as the availability of cigarettes. There was no indication that moderate levels of drinking lowered rates of smoking cessation.

Over two years of follow-up, there was considerable variability in drinking levels with less than 60% of participants remaining in the same category of consumption level for each drinking index examined (frequency, quantity of consumption, and frequency of heavy drinking). However, those quitting smoking for 6 months or longer did not show greater changes in drinking than other smokers. In many ways this is surprising given that smoking and alcohol consumption can be considered complementary behaviors, which might be likely to change in tandem. On the other hand, these results may reflect an asymmetry in the smoking-drinking relationship. Alcohol consumption, by its more episodic and situation-specific pattern, may act as a strong cue for smoking cigarettes, as smokers may reliably smoke more after drinking. Smoking cigarettes, however, may have relatively little cuing value for alcohol use because for most smokers numerous occasions of smoking occur throughout the day without alcohol consumption ensuing. Thus, although heavy alcohol consumption may increase risk for smoking relapse, the removal of smoking cues due to smoking cessation may not be sufficient to lead to reduced drinking.

A handful of prior studies have also found little evidence that individuals who quit smoking reduce their drinking more than those who continue to smoke (Carmelli et al., 1993; Gordon and Doyle, 1986; Murray et al., 2002; Nothwehr et al., 1995). We extended these prior studies (a) by examining three indices of drinking rather than one summary variable, (b) by testing whether results differed across four developed English-speaking countries, and (c) by distinguishing those who made efforts to quit smoking from those who did not. We did not find differential change in drinking between those attempting to quit smoking and those who did not attempt, nor did we find that country or sex moderated results. Also, results were generally consistent across all drinking indices examined.

A prior study found that quitting smoking reduced the odds of heavy drinking over time (Karlman et al., 2006). In one analysis, we did find a slightly greater likelihood of reduction in heavy drinking among those quitting smoking; however, this effect was only found in weighted analyses that did not covary age, sex, heaviness of smoking, and intention to quit smoking. Thus, we found very limited evidence that quitting smoking associates with reduction in heavy drinking, suggesting any strong causal connection between these two variables is unlikely. The Karlman et al. study examined individuals at 5-10 year intervals over 20 years. Our two-year follow-up window may not have been sufficient to capture the changes shown in that study. However, in an exploratory analysis, we found that quitting for longer than 2 years did not associate more strongly with changes in drinking than quitting for 6-24 months.

Based on prior theory regarding associations between alcohol use and smoking, we hypothesized that lighter smokers and non-daily smokers would be especially likely to reduce drinking when quitting smoking. Although the number of non-daily smokers in the sample was small, there was no evidence that occasional and light smokers changed drinking differentially when quitting smoking compared to daily and heavier smokers.

4.1. Limitations

There were some notable limitations to this study. We relied on self-reported alcohol use and smoking, which could result in underreporting. Also, although the overall sample size was large, there was substantial attrition across follow-up. There was greater attrition from follow-up associated with greater frequency of heavy drinking, which would weaken results if participants who did not complete follow-ups were more likely to continue to smoke than those who did complete. Furthermore, the number of individuals drinking heavily more than once a week was rather small, limiting our ability to examine change in drinking among these heaviest drinkers. Country was not found to moderate findings; although this suggests that the associations examined are consistent across developed English-speaking countries, the relatively low number of frequent heavy drinkers limited power to examine cross-country differences in significant associations.

It is important to note that the association between drinking and smoking cessation can be bi-directional. That is, (a) individuals who reduce their drinking may have greater success at future attempts at smoking cessation, (b) individuals who quit smoking may reduce drinking over time, and (c) individuals may reduce drinking and quit smoking at the same time. The present study addressed primarily the latter two patterns. To address whether reducing drinking enhances future smoking cessation success would require examination of a future wave of data so that change in drinking from Wave 4 to Wave 6 could be used to predict future smoking cessation.

4.2. Conclusions

Results of this study have a few implications. First, it does not appear necessary for most smokers to reduce their drinking in order to maximize their success at quitting smoking. Moderate drinking, in particular, does not appear a hindrance to smoking cessation. Given that frequent heavy drinkers have lower odds of smoking cessation, interventions to reduce heavy drinking may ultimately lead to greater success in future quit attempts in this group. However, this study cannot provide any direct evidence towards that end.

The fact that smoking cessation does not necessarily promote reductions in drinking is of importance to efforts to enhance public health. Quitting smoking and reducing hazardous drinking do not appear incompatible, and both are important goals. Results of this study suggest that interventions and policies directed at increasing smoking cessation are not likely to result in changes in hazardous drinking unless they directly target alcohol use either through integrated interventions or through policies that affect locations of alcohol consumption or the price of alcohol. Although combining alcohol interventions with smoking cessation treatment may not have a large impact on increasing smoking cessation rates, these interventions can at least reduce drinking in those smokers who exceed recommended limits for safe drinking (Kahler et al., 2008a). Likewise, some smoking-related policies can have a beneficial impact on alcohol consumption if they have a direct impact on venues where alcohol consumption is permitted. For example, a policy banning smoking in indoor places in Scotland resulted in reduced drinking in pubs and bars among moderate- and heavy-drinking smokers (McKee et al., 2009). Thus, carefully constructed smoking cessation interventions and smoking-related policies can be implemented that have a beneficial impact on drinking behavior without harming efforts to decrease the prevalence of smoking.

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Table 1
Drinking Indices and Their Associations with Quitting Smoking Behaviors at Wave 6 and with Change in Drinking

Drinking at Wave 4	n	Quitting Behaviors Within Each Drinking Category - Entire Sample			Change in Drinking at Wave 6 by Drinking Level at Wave 4		
		Sustained Quit	Attempted to Quit	Proportion Who Quit ¹	Decreased	Stable	Increased
<i>Drinking Frequency</i> ¹							
Never	573	10.7%	48.3%	23.3%	---	73.9%	26.1%
Less than monthly	717	12.2%	55.1%	23.5%	21.0%	48.4%	30.6%
1-3 days/month	564	14.0%	52.9%	27.9%	35.6%	30.1%	34.2%
1-2 days/week	854	13.2%	53.4%	26.1%	29.8%	49.1%	21.1%
3-4 days/week	377	13.1%	59.3%	22.9%	43.9%	32.8%	23.3%
5+ days/week	520	11.2%	52.8%	22.8%	33.8%	62.2%	---
<i>Significance</i>							
		ns	ns	ns			
<i>Weekly Quantity</i> ²							
None	573	10.7%	48.3% _a	23.3%	---	74.4%	25.6%
Light	1321	12.7%	54.4%	24.6%	16.2%	62.5%	21.3%
Moderate	1028	13.8%	54.9%	26.5%	26.7%	56.0%	17.3%
Heavy	363	12.7%	59.4% _{a,b}	22.4%	56.8%	25.8%	17.4%
Very Heavy	311	10.6%	46.9% _b	24.1%	42.8%	57.2%	---
<i>Significance</i>							
		ns	p = .001 ⁵	ns			
<i>Heavy Drinking Freq.</i> ³							
Never	2128	12.0%	50.8% _{a,b,c}	24.7%	---	79.1%	20.9%
<1 day/month	829	13.2% _a	55.8% _a	25.4%	39.1%	37.8%	23.2%
1-3 days per month	314	14.5%	59.4% _b	25.4%	52.3%	29.2%	18.5%
One day a week	143	17.8% _b	63.7% _{c,d}	29.5%	57.7%	27.9%	14.5%
>1 day/week	183	6.6%	48.3%	13.9%	68.9%	31.1%	---
<i>Significance</i>							
		p = .011	p = .0002	ns			

Note. The ns in column 2 are unweighted. All other percentages are weighted to adjust for attrition from Wave 4 to Wave 6. Percentages within a column sharing subscripts (e.g., two percentages that both have subscript 'a') differed significantly at p < .05.

¹Data on drinking frequency were missing for 9 participants.

- ² Light drinking = some drinking but <3 drinks per week; moderate drinking = 3-7 drinks per week for women, 3-14 drinks for men; heavy drinking = >7 drinks per week for women, >14 drinks per week for men; very heavy drinking = >14 drinks per week for women; >21 drinks per week for men. Data on weekly consumption were missing were 18 participants.
- ³ Data for heavy drinking frequency were missing for 17 participants.
- ⁴ Proportion who quit indicates the percentage of those who reported making a quit attempt between Wave 4 and Wave 6 who were currently not smoking for more than 6 months at Wave 6.
- ⁵ These associations were nonsignificant in models that covaried country, sex, age, heaviness of smoking at Wave 4, and intention to quit at Wave 4.

Table 2
Associations Between Smoking Status at Wave 6 and Changes in Drinking from Wave 4 to Wave 6

Smoking Status at Wave 6	n	Change in Drinking Frequency			Change in Drinking Level			Change in Heavy Drinking Frequency		
		Decreased	Stable	Increased	Decreased	Stable	Increased	Decreased	Stable	Increased
No quit attempt	1703	25.3%	52.1%	22.6%	23.4%	58.4%	18.2%	20.0%	59.8%	20.2%
Made attempt – currently smoking	1296	27.4%	48.2%	24.4%	22.9%	56.7%	20.4%	23.5%	56.8%	19.7%
Quit for > 6 months	395	29.5%	46.2%	24.3%	26.4%	57.1%	16.5%	26.4%	56.6%	17.1%
Significance ¹		ns			ns			p = .02 ²		

Note. The ns in column 2 are unweighted. All other percentages are weighted to adjust for attrition from Wave 4 to Wave 6. Decreased drinking refers to moving to a lower category of alcohol consumption level between Wave 4 and Wave 6, while increased drinking refers to moving to a high category of consumption level.

¹ Significance of the association between smoking status and change in drinking status was tested by a weighted ordered logistic regression.

² This association was nonsignificant in unweighted analyses and in analyses that covaried heavy drinking frequency at Wave 4, country, sex, age, heaviness of smoking at Wave 4, and intention to quit at Wave 4.