

POLICY

Changes in Alcohol Availability, Price and Alcohol-related Problems and the Collectivity of Drinking Cultures: What Happened in Southern and Northern Sweden?[†]

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[†]This analysis is part of the study 'Effects of major changes in alcohol availability', conducted collaboratively by researchers at the Centre for Social Research on Alcohol and Drugs of Stockholm University, the Faculty of Health Sciences of the University of Southern Denmark, Esbjerg, and the Alcohol and Drug Research Group of the National Research and Development Centre for Welfare and Health (STAKES), Helsinki.

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Abstract — **Aims:** The aims of this study were to study whether alcohol-related self-reported problems follow the same pattern of changes in alcohol consumption in southern Sweden, assumed to be affected by a decrease in Danish spirits tax and by an increase in Swedish travellers' import quotas, and to study whether the results obtained for southern and northern Sweden follow the predictions of Skog's theory of collectivity of drinking cultures. **Methods:** Analysis was carried out on a sample from the Swedish general population from southern and northern Sweden separately. Two indices such as impaired self-control/dependent behaviour and extrinsic problems for alcohol-related problems were computed and analysed in terms of sex, age, income and alcohol consumption level. **Results:** Although there were no huge changes in the number of persons reporting alcohol-related problems, the general trend in data for various subpopulations was a decrease in the southern site and an increase in the northern site. In the northern site, the increase in alcohol consumption among men also showed an increase in alcohol-related problems. However, various population subgroups changed in different directions and did not move in concert over the population distribution. **Conclusions:** Analysis confirmed that alcohol-related problems, according to the two indices used, followed a similar pattern to alcohol consumption, but less divergent. A version of Skog's theory applied on alcohol-related problems could not confirm that alcohol-related problems did not change collectively within the population.

INTRODUCTION

When Denmark reduced its spirits tax by 45%, on 1 October 2003, and Sweden increased its travellers' quotas, on 1 January 2004, to levels that made it possible to bring back almost unlimited amounts of alcohol to Sweden from elsewhere in the European Union (EU), it was hypothesized that alcohol consumption in Sweden would peak and that alcohol-related problems would follow accordingly. This was in accordance with the economic literature that links price to alcohol consumption and its consequences (Chaloupka *et al.*, 2002). Although most studies have looked at total consumption or register data (Andreasson *et al.*, 2006; Bloomfield *et al.*, 2009; Cook 1981; Cook and Tauchen 1982; Cook *et al.*, 2005; Hertzua *et al.*, 2008a,b, 2009; Koski *et al.*, 2007; Wagenaar *et al.*, 2009), a few studies have also been able to link the decreased taxation on alcoholic beverage to an increased self-reported consumption of that beverage (Heeb *et al.*, 2003) and more reported social problems (Mohler-Kuo *et al.*, 2004).

As southern part of Sweden is closer to Denmark and Germany than the rest of Sweden, southern Sweden had a much higher share of imports and consumption of illegal alcohol compared with the rest of Sweden, prior to the changes (Gustafsson and Trollidal, 2004). It was therefore hypothesized that the changes would have greater effects on the levels of consumption and problems there than in the rest of Sweden. Although northern part of Sweden is assumed to have the same drinking culture as in the southern parts, the effects by the increased traveller's quotas and decreases in prices in Denmark are less due to distance; thus, northern Sweden was used as control. This hypothesis was tested in

the Nordic tax study, which also covered similar changes in travellers' allowances in Denmark and Finland as well as alcohol tax decreases in Finland in March 2004 (an average tax decrease of 33% on all alcoholic beverages or 44% decrease on spirits corresponding to a 36% lower off-premise retail price on spirits).

However, the first analysis of changes in alcohol consumption as reported in population surveys in these countries found that the changes had not had any general effects in any of the study sites (Denmark, Finland and southern Sweden), although there were changes in some subgroups of the population, for example, among women in southern Sweden and men in Denmark (Mäkelä *et al.*, 2007). Follow-up analysis on Swedish data through 2006, 3 years after the changes, confirmed that there had not been any significant overall increase in consumption in southern Sweden (Gustafsson, 2010). These results suggested that there had been a decrease in volumes of alcohol consumption among younger and middle aged men, but an increase among younger and middle aged women in the southern area, whereas roughly the opposite pattern was observed in the north. People in high income groups in the south were showing decreases, whereas in the north only women with a high monthly income had decreased their consumption. Among heavy consumers (the highest 10%), in southern Sweden, women as well as persons older than 50 years had shown increased alcohol consumption, whereas women reported lower consumption in the north (older persons increased in this site as well).

Skog's theory of collectivity of drinking cultures (Skog, 1985) states, in brief, that the whole population moves upwards on the consumption scale when the mean consumption increases (and likewise for decreases). On the basis of a

model in which society is conceived of as a large network with many ties between individuals, each actor living in the same society/culture is influenced by and influences other members of society—directly or indirectly through other ties linked to personal social networks. Therefore, Skog argues, each person in a culture will tend to adjust his/her alcohol consumption to other persons within the same culture, and alcohol consumption will fluctuate up and down in concert. In response to Gmel and Rehm (2000), Skog (2001) elaborates on his theory and more explicitly states that collectivity refers to 'cultural differences (between populations) and changes over time (in a specific population)'; thus, the collectivity concept is thus 2-fold, predicting differences between populations and an uniformity of responses within a population. According to this model, consumption in southern and northern Sweden, as part of the same drinking culture, would be expected to behave in the same way. However, with differences in relevant determinants, such as the tax and quota change, the site less affected should be expected to change in the same direction but to a lesser degree. The findings on the changes in reported alcohol consumption (Gustafsson, 2010), however, imply that there was probably not an overall uniform change in amounts of drinking in Sweden at this time; nor did the various subgroups seem to move in concert.

As mentioned above, when designing the study, the southern and northern regions of Sweden were selected on the assumption that they were part of the same society and culture, thus part of the same drinking culture, the difference being that one region (south) would possibly be affected by the tax decrease in Denmark and the increased Swedish traveller's import quotas, while the other region (north) would not. The results found in the study of self-reported alcohol consumption (Gustafsson, 2010) raise questions about this model. In fact, although the differences in overall trends were not significant between the two sites, they seemed to be moving in opposite directions from each other; where there was an increase in average consumption in the northern area between 2003 and 2006, and persons in the southern area (if anything) rather decreased their consumption. Additionally, there seemed to be differences in patterns of change between different population subgroups, within sites and between sites. For example, men in the north increased their consumption, whereas the trend among men in the south seemed to be negative; among women the opposite pattern was observed. Moreover, different age groups did not behave in a similar manner: in groups where consumption seemed to increase in the north, it decreased in the south. Additionally, the different age groups (by sex) behaved differently within the same region. The same was true for income groups and for the subgroup of high consumers. Likewise, Romelsjö (1989) has shown that various population groups change differently when the average consumption level changes. These studies can be seen as examples of a weakened theory of the collectivity of drinking. Skog (2001) in some way allows for this in his response to Gmel and Rehm (2000), as he cites examples of 'exceptions from the overall pattern'. However, in elaborating on his theory from 1985 in this way, there is not too much left of the hypothesis of collectivity at all.

Alcohol-related problems do usually follow consumption trends. When consumption and alcohol-related problems do not follow each other, there is often a lagged effect for

problems (Skog, 1987). This, however, is usually related to certain types of harms, for example, liver cirrhosis, which develops over a longer period of time than do acute harms, but even for these types of harms an effect may be observed in a shorter perspective on an aggregated level (Herttua *et al.*, 2008a). There are also some Nordic studies, showing that the effect of policy changes on the rates of alcohol-related problems (at least as reported in registers) may sometimes be greater than the effect on the (total) alcohol consumption level; sometimes, an effect on alcohol-related problems is also observed even when no measurable effect on overall drinking level has been found (Room *et al.*, 2002). It has additionally been suggested that when there is a change in alcohol-related problems (liver cirrhosis rates) without a measurable change in alcohol consumption, this can be explained by the changes in treatment of alcohol abuse and AA membership (Mann *et al.*, 1988; Smart and Mann, 1991, 1993; Smart *et al.*, 1998). The changes in the rates of self-reported problems, however, can reflect the changes in the perception and in the threshold for what is considered as a problem, as well as changes in more objective events. Thus, when Midanik and Clark (1995) found that self-reported alcohol consumption decreased while the rates of self-reported problems did not change (except for in some groups where it increased), two potential explanations were offered. One was that alcohol consumption decreased particularly among the general public, where those who had problems generally experienced minor problems, whereas problem drinkers did not change their drinking pattern. The second potential explanation was that there is a threshold for when problems are counted as problems, and that this may vary; when consumption decreases, what is counted as a problem may also change, especially as observed in surveys.

Bloomfield *et al.* (2010) looked into some reported alcohol-related problems, reported in a comparable manner for all three countries in the Nordic tax study, by sex and age. They did not find increases in problems in Denmark or southern Sweden, although in Finland and northern Sweden increases could be found among some subgroups, and separate analyses of register data on problems from very heavy drinking showed increasing rates in Finland (Mäkelä and Österberg, 2009). *Post hoc* explanations have suggested that Denmark and southern Sweden have more 'continental' drinking habits, and that they follow the general decrease found in many other European countries, whereas Finland and northern Sweden are lagging behind this development, thus retaining a typical Nordic drinking style (Norström, 2001). Additional problem items were included in Sweden, which would give us the opportunity to look more closely at alcohol-related problems as two indexes and by additional population groups.

From this perspective, it is also of interest to study the patterns of alcohol-related problems in Sweden after changes in price and availability in light of Skog's theory. Although Skog's theory concerns consumption rather than alcohol-related problems, it can be argued that alcohol-related problems should be expected to follow accordingly, due to the strong relation between the two variables, and that we should be able to obtain a rough approximation of whether there was any collectivity in problems. On the basis of the theory of collectivity of drinking cultures, we would thus expect the changes in alcohol-related problems to change (relatively)

and to rise and decline together in the southern and northern parts of Sweden. On top of this, in comparing rates in the two problem indexes in 2003 with rates in 2004–2006, we should find a greater increase in southern Sweden because alcohol prices, broadly considered, decreased and purchases abroad were already more common in the southern site. Thus, people in the north are expected to follow, but initially to a lesser extent than in the south. According to the 1985 version of the collectivity hypothesis, all subgroups in a population should behave in a similar way, so that both in the north and in the south men and women, different age and income groups, and the highest 10% of consumers versus others, should also move in concert. For the analyses, besides comparing the overall changes in alcohol-related problems to overall changes in consumption, it is also logical to make comparisons of problem rates by population groups.

The 2-folded aim of the present study will be to:

- (1) study whether self-reported alcohol-related social problems, mainly presented by two indexes describing (a) impaired self-control/dependent behaviour and (b) extrinsic problems, followed the same pattern of changes in southern and northern Sweden as did self-reported alcohol consumption as reported by Gustafsson (2010);
- (2) study whether self-reported alcohol-related problems according to these two indexes changed collectively, that is, in the same direction, in the two sites and among various population groups after the Danish tax decrease and the Swedish abolition of import quotas on alcohol; this will be analysed on the basis of Skog's strong version of the collectivity of drinking cultures theory (Skog, 1985).

METHODS

Data from the Nordic tax study were used; a telephone survey with a sample from the adult Swedish population, aged 16–80 years old, was carried out during the third quarter (July–September) of 2003, prior to the Danish tax change and the increase in quotas, by the national survey institute Synovate Sweden AB (former Temo). The samples were generated by random digit dialling, and interviews were carried out using a computer-assisted telephone interviewing system. New cross-sectional samples were drawn in each site the following years until 2006, following the same procedure as in 2003. From these samples, a southern and northern sample was included in the design. The southern part, including Scania and Gothenburg, was defined by its proximity to Denmark via bridge or ferry (for definition and map, see Mäkelä *et al.*, 2008). The northern part, which was believed to be relatively unaffected by the changes and served as a control area, included an area 150 km west of Stockholm up to 150 km from the Finnish border in northern of Sweden.

As initial analysis of the problem indexes for each year separately did not differ significantly between the 3 years (2004, 2005 and 2006) following the changes, the results will therefore be presented as a comparison between before (2003) and after (2004, 2005, 2006 together) the Danish tax decrease and the abolishment of private import quotas had

taken place; this should also result in more stable results. The samples analysed included 1425 persons in the southern sample and 1336 in the northern sample in 2003, and between 972 and 1406 in the southern sample and between 994 and 1343 in the northern sample in 2004, 2005 and 2006. The cooperation rates were 50.5% in 2003 (before the changes) and 45.3% in 2004, 2005 and 2006 (after the changes) in the southern parts of Sweden, and the corresponding figures for the northern parts were 48.4 and 42.3%. These response rates are similar to those in other similar Swedish surveys (Hradilova Selin, 2004; Leifman and Gustafsson 2003), but the implications of these rates are further discussed in the last section of the paper.

Impaired self-control and extrinsic problems

A total of 16 separate questions (see the table in Appendix) about social problems related to alcohol were posed in Sweden (which meant additional items beyond those included in the cross-national study by Bloomfield *et al.*, 2010). Between 774 and 1412 respondents in the southern site and 685 and 1335 in the northern site responded to the single problem questions. Most responses were made on a three-point scale ('yes, more than once', 'yes, once' and 'no'), although questions obtained from the alcohol use disorders identification test had five response alternatives (varying from 'never' to 'daily or almost daily'). In an ongoing national study, the Swedish Monitoring Project (Boman *et al.*, 2007), results for some of the questions have been reported question by question. Internationally, however, the most common strategy in the literature on social alcohol-related questions is to use an additive score with positive answers on a domain or measure, sometimes derived on conceptual grounds and sometimes through a factor or cluster analysis (Room, 2000). A common division of the items has been between those indicating psychological problems or impaired self-control and those indicating social or extrinsic problems, potentially externally verifiable (Cahalan and Room, 1974; Rootman and Moser, 1984). In the present analysis, this conceptual division was made. After each of the reply alternatives had been dichotomized, seven items were scored in impaired self-control and nine in extrinsic problems (see Table 1), with one point for each item that the respondent answered positively concerning the past 12 months. A factor analysis was also carried out in SAS 9.1 on all 4-years together. The principal components analysis generated five factors with eigenvalues higher than 1.0, but four of these had eigenvalues of 1.27 or lower. As in many other studies (Gmel *et al.*, 2000; Room and Hradilova Selin, 2004; Wicki *et al.*, 2009) where factor analysis has been used to construct indexes for social alcohol-related problems, most questions loaded strongly on the first factor, with an eigenvalue of 3.82. After using varimax rotation and limiting the analyses to the two factors, the rotated factor analyses came close to reproducing a distinction between impaired self-control and extrinsic problems. Two items assigned to extrinsic problems (getting in a quarrel and relative/friend disturbed by the respondent's drinking) loaded higher on the second factor, although also fairly high on the first, while a third item (the respondent's drinking caused an accident or injury to self or another) loaded equally on both factors. Thus, for the analysis, a first index describing impaired self-

Table 1. Proportion (%) who reported alcohol-related problems and total number of problems in samples in northern and southern Sweden before (2003) and after changes (2004, 2005, 2006)

Items refer to last 12 months ^a	South		North		Factor loadings (with Varimax rotation)		
	Before changes	After changes	Before	changes	After changes	Factor 1	Factor 2
Overall rates							
At least one harm	30.2	24.3*** ^(†)	23.1		20.9 ^(*)		
At least 2 harms	17.6	14.1**	13.4		12.4		
At least 3 harms	11.0	8.8*	8.7		8.4		
Index 1: impaired self-control/dependence (positive on 2+)	15.2	14.2	13.3		14.5		
Alcohol negative to finances	7.9	7.4	6.4		6.5	0.5	0.3
Unable to stop	4.6	3.7	3.2		3.3	0.6	0.0
Failed to do what was expected	9.9	8.2 ^(*)	8.6		7.9	0.6	0.0
Needed drink to get up	1.6	1.4	1.0		1.4	0.3	0.2
Guilty feelings	9.2	7.5*	8.0		7.5	0.7	0.1
Memory loss	9.5	8.6 [†]	7.3		9.4*	0.7	0.1
Regretted things said or done	16.0	15.9	14.5		14.9	0.6	0.2
Index 2: extrinsic problem (positive on 2+)	7.1	5.2*	5.1		5.4		
Got into a quarrel	9.5	7.8 ^(*)	7.3		7.7	0.5	0.3
Got into a fight	2.0	1.6	1.9		2.0	0.2	0.4
Passenger in car with drunk driver	3.2	2.1*	2.1		2.1	0.0	0.6
Driving after drinking	1.3	1.3	0.5		0.7	-0.1	0.6
Alcohol harmed work/studies	2.8	1.8 ^(†)	1.2		1.5	0.2	0.4
Alcohol harmed family	1.5	0.8* [†]	0.6		0.9	0.2	0.4
Alcohol harmed friendships	1.3	1.3	1.3		1.2	0.3	0.3
Relative/Friend disturbed by drinking	5.1	4.1	3.7		3.9	0.5	0.3
Caused accident or injury to self or another	4.0	3.0	2.7		3.2	0.4	0.4

^aFor the exact wording, see the table in Appendix.

(*) $P < 0.10$, * $P < 0.05$, ** $P < 0.01$, *** $P < 0.0001$, ^(†) $P < 0.10$, [†] $P < 0.05$. *Significantly different from 2003. [†]Change significantly different from that found in the control site.

control and dependence symptoms, which roughly could be said to be problems of a more subjective nature, and a second index referring to extrinsic problems—more concrete problems that affect others to a larger extent—were retained. Persons were identified as having had these types of problems if they had a positive response to at least two items composing the specific index (Table 1).

In the results discussed below, the separate alcohol-related problem questions are first presented, followed by results from analyses of the indexes. Problems are reported for these indexes by region and further divided by sex, age group (16–29, 30–49, 50–80 years), monthly income (high, medium, low income [Income levels: high €2700 and above, medium €1350–2700, low income below €1350 per month. The rationale for this categorization is based on income in relation to the median income in Sweden which roughly corresponds to these levels based on statistics from Statistics Sweden: www.scb.se. Income is dependent on sex or rather whether occupations are perceived as a female or male occupation why more men are found to have higher incomes (~15 vs 5% in our sample) and more women are found to have lower incomes (45 vs 25%).]) and alcohol consumption level [highest 10% of consumers; the cut-off point (90% quantile) was selected for each year resulting in 10.33 L of pure (100%) alcohol per year in 2003 and 10.53, 9.52, 9.12 in 2004, 2005, 2006, respectively, in southern Sweden. The corresponding cut-off points for northern Sweden were 7.44, 7.53, 7.57 and 7.88. This resulted in an average volume of consumption of 21.05 L of pure alcohol in the 2003 sample and 22.38 L in the 2004–2006 sample in the southern site and corresponding averages of 15.05 and 17.23 in the northern site]. Changes between the pre- and post-intervention

results were tested using the Pearson χ^2 test for each question and index, by population group in the southern parts of Sweden. Because northern Sweden served as a control site, the results from this site were tested in a similar way. The difference in pre- and post-intervention changes between the two sites was also tested using the logistic procedure; with a dummy variable for year (2003/other) and a dummy variable for site (south/north) as well as an interaction term between the two. To test Skog's theory of the collectivity of drinking cultures, additional tests between various subpopulations were also performed. Equivalent logistic regressions were performed with dummies for year (2003 vs. other) and subgroups (e.g. men vs. women) when differences within sites between sexes, age groups etc. were analysed. To test the difference between sites in differences in change between subgroups, a dummy for site was also included. All analyses were weighted by sex and age to represent the adult population in the two regions. If not noted otherwise, a significant result below indicates significance at the 5% level. For more details on data and methods in the Nordic tax study, see [Mäkelä et al. \(2007\)](#).

RESULTS

Initial analysis by single alcohol-related problem item did not show a great deal of variation in changes of prevalence pre- and post-intervention for the questions separately (Table 1). At the level of the two scores, there was only a significant change for extrinsic problems: a decrease in the south. For an overall problems score, whether the division was at one or more, two or more, or three or more problems, the results went in the

same direction, with significant decreases in problems in the south, but generally non-significant change in the north. In the southern site, the few specific problem items showing significant change moved in a negative direction; they were less common after the interventions. These were 'having had guilty feelings after consuming alcohol', 'having been a passenger in a car where the driver had been drinking alcohol', whether 'alcohol had harmed work or studies' or whether 'alcohol had harmed relationships with family or the relationship with a partner'. The change in answers to the questions about harming family or partner relationships was also shown to be significantly different from the change in the north (small non-significant increase). In the northern site, individuals had experienced memory loss more often after the interventions and this difference in change was also significant between the sites, although the decrease in the south was not in itself significant.

Looking at the direction of change at the item level and ignoring significance, all seven impaired self-control items in the south decreased, while five of them increased in the north. For extrinsic problems, all nine decreased in the south, while seven of them increased in the north.

Overall changes and changes within subgroups by index, within sites and between sites

Further analyses were carried out at the level of the two indexes. Table 2 shows the changes in percentages with two or more positive items on impaired control and on extrinsic problems within and between the two sites by sex and by age group.

Changes in impaired control

No significant change on impaired control was observed (Table 2) by sex in the south, other than among men and among women aged 50–80 years ($P < 0.01$), with both groups showing a significant decrease. Because there were also small (non-significant) increases in these groups in the northern site, the differences in change between the sites were significant. In the north, a significant increase could be noted for the whole group of men, which also resulted in pre- and post-intervention change in the impaired control index being significantly different from that in the south. No significant changes could be noted, however, among the various age groups in this site.

There were no changes found by income group (Table 3) in the southern site. In the northern site, however, impaired control problems were found to have increased significantly among men with lower incomes.

Among the 10% in each site who drank the greatest volume of alcohol, there were no significant changes in the impaired control measure for the southern or for the northern site, nor were there significant changes in the overall analysis or by sex (Table 4). Owing to non-significant decreases in the south and non-significant increases in the north, however, significant differences in change between the sites were observed, mainly among the men. By age group, the youngest men, aged 16–29 years, in the southern site showed significant decreases in impaired control, as did the men in the low-income group. These changes were also significantly different from the non-significant increases found among persons living in the north. For other age groups or income groups or among women, the proportion of people

Table 2. Proportion (%) reporting impaired control and extrinsic problems from drinking before and after policy changes, for complete samples and by sex and age

	South Sweden			North Sweden		
	Before	After	Change (%)	Before	After	Change (%)
Index 1: impaired control/dependence	<i>n</i> = 1425	<i>n</i> = 3429		<i>n</i> = 1336	<i>n</i> = 3392	
Complete Sample	15.2	14.2	-7	13.3	14.5	9
Men	18.7	17.6	-6 [†]	14.8	18.9	27*
Women	11.8	10.6	-10	11.4	9.8	-15
Men	<i>n</i> = 634	<i>n</i> = 1619		<i>n</i> = 639	<i>n</i> = 1570	
16–29 years	39.7	42.8	8	42.4	44.5	5
30–49 years	14.1	15.5	10	12.7	17.1	35
50–80 years	8.2	4.1	-49** ^{††}	3.6	6.2	73
Women	<i>n</i> = 791	<i>n</i> = 1810		<i>n</i> = 697	<i>n</i> = 1822	
16–29 years	27.5	31.2	13 ^(†)	38.1	29.5	-23
30–49 years	8.1	6.9	-15	9.4	7.1	-24
50–80 years	5.9	2.0	-66** ^{††}	0.2	2.2	848 ^(*)
Index 2: external problems	<i>N</i> = 1425	<i>N</i> = 3429		<i>N</i> = 1336	<i>N</i> = 3392	
Complete sample	7.1	5.2	-27** ^(†)	5.1	5.4	6
Men	8.9	6.4	-28** ^{††}	6.0	8.3	39 ^(*)
Women	5.4	3.9	-27	4.1	2.4	-43*
Men	<i>n</i> = 634	<i>n</i> = 1619		<i>n</i> = 639	<i>n</i> = 1570	
16–29 years	24.4	17.0	-30** ^{††}	17.6	26.9	52*
30–49 years	4.0	4.4	11	4.4	4.7	7
50–80 years	2.6	1.7	-35	1.7	1.2	-29
Women	<i>n</i> = 791	<i>n</i> = 1810		<i>n</i> = 697	<i>n</i> = 1822	
16–29 years	17.2	12.6	-26	11.4	7.7	-32
30–49 years	2.1	1.7	-22	3.9	1.4	-64*
50–80 years	1.4	0.8	-41	0.7	0.5	-33

(*) $P < 0.10$, * $P < 0.05$, ** $P < 0.01$, ^(†) $P < 0.10$, ^{††} $P < 0.05$, ^{†††} $P < 0.01$. *Significantly different from 2003. [†]Change significantly different from that found in the control site.

Table 3. Proportion (%) reporting impaired control and extrinsic problems from alcohol before and after policy changes, by gender and income group

	South Sweden			North Sweden		
	Before	After	Change (%)	Before	After	Change (%)
Index 1: impaired control/dependence						
Men	<i>n</i> = 634	<i>n</i> = 1619		<i>n</i> = 639	<i>n</i> = 1570	
<i>Income by month</i>						
High (€2700 and above)	7.1	8.1	13	3.8	10.9	188
Medium	17.8	15.3	-14	12.9	13.1	2
Low (below €1350)	28.8	31.9	11	27.1	38.8	43*
Women	<i>n</i> = 791	<i>n</i> = 1810		<i>n</i> = 697	<i>n</i> = 1822	
<i>Income by month</i>						
High (€2700 and above)	7.6	7.6	0	0.0	7.1	709
Medium	10.2	7.6	-25	6.9	7.7	13
Low (below €1350)	14.6	15.9	9 ^(†)	18.2	13.0	-29 ^(*)
Index 2: extrinsic problems						
Men	<i>n</i> = 634	<i>n</i> = 1619		<i>n</i> = 639	<i>n</i> = 1570	
<i>Income by month</i>						
High (€2700 and above)	2.7	3.1	15	4.6	1.9	-59
Medium	6.9	4.5	-36 ^(*)	4.0	4.4	11
Low (below €1350)	18.4	14.2	-23 ^(††)	11.5	21.8	89 ^{**}
Women	<i>n</i> = 791	<i>n</i> = 1810		<i>n</i> = 697	<i>n</i> = 1822	
<i>Income by month</i>						
High (€2700 and above)	0.0	1.7	168	5.7	1.6	-72
Medium	2.8	2.1	-114	1.5	1.6	11
Low (below €1350)	7.9	6.8	-14	7.3	3.7	-50*

(*) $P < 0.10$, * $P < 0.05$, ** $P < 0.01$, (†) $P < 0.10$, †† $P < 0.01$. *Significantly different from 2003. †Change significantly different from that found in the control site.

reporting problems according to the first index did not change significantly. Among those drinking less than the top 10%, men aged 16–29 years and living in the south, reported a significant increase in impaired problems. Among both men and women ($P < 0.01$), persons older than 50 years in the south showed a significant decrease in impaired control, whereas the same population groups in the northern site did not change significantly. These changes were, however, significantly different ($P < 0.01$ vs. $P < 0.05$) between the sites. By income group, a significant increase in impaired control was observed among men living in the south with the lowest income. No other groups among non-heavy drinkers were found to have changed significantly.

Changes in extrinsic problems

A significant decrease in positive responses to extrinsic problems (2+ problems) could be noted in the southern region (Table 2). While in the north an increase was observed in this index, but it was not large enough to be significant in the whole population.

The share of extrinsic problems among men in the south was shown to have decreased significantly, whereas in the north a significant decrease was found among women (Table 2). Dividing by age, significantly fewer of the youngest men reported these types of problems in the southern site, while the number reporting these problems increased significantly in this group in the north. Among women, those aged 30–49 years in the north reported a significant decrease in alcohol-related problems of this type. For the whole group of men, the changes were also shown to be significantly different between the sites ($P < 0.01$), as were the changes among the youngest men, aged 16–29 years ($P < 0.01$).

In the southern site, extrinsic problems were not found to be significantly different by income group (Table 3), but among those with a low income in the northern site a significant increase was observed among men ($P < 0.01$) and a significant decrease among women. The change among northern men with a low income was additionally shown to be significantly different ($P < 0.01$) from the non-significant negative change in the southern site.

Among those drinking the most (highest 10% of consumers; Table 5), extrinsic problems decreased in the southern site ($P < 0.01$), particularly among men ($P < 0.01$) and especially among the youngest men ($P < 0.01$) in this site. Significant differences in the change between the sites were observed for all these groups ($P < 0.01$, respectively), even though the only significant change observed in the northern site was among the young men, more of whom reported extrinsic problems. Fewer men in the medium/low-income group in the southern site reported extrinsic problems after the policy changes than before. A significant decrease was also observed among men in the lowest income group in the northern site. The difference in change was significantly different between the two sites for this group ($P < 0.01$). The share reporting extrinsic problems among high consuming women did not change significantly by age or income group. Among those drinking less amounts of alcohol, only women aged 30–49 years in the northern site changed significantly by sex and age or income, and there was not a significant difference in the changes between the sites.

Comparing differences in change between population subgroups, within site and between sites

Sex

The difference in changes between men and women (Table 6) was observed to be significantly different in

Table 4. Proportion (%) reporting problems from alcohol before and after policy changes, by sex, age, income group among *high consumers* (highest 10% each year) and *non-heavy drinkers* (not highest 10%)

Impaired control/dependence	South Sweden		North Sweden			
	Before	After	Change (%)	Before	After	Change (%)
High consumers (10%)	<i>n</i> = 139	<i>n</i> = 323		<i>n</i> = 132	<i>n</i> = 307	
All	42.5	36.2	-15 [†]	32.4	41.7	29 ^(*)
Men	41.1	35.2	-14 [†]	32.1	42.6	33 ^(*)
Women	48.6	40.2	-17	33.6	37.1	11
Men						
16–29 years	78.95	57.60	-27 ^{*,†}	63.27	71.26	13
30–49 years	25.96	43.25	67	26.70	44.62	67 ^(*)
50–80 years	12.75	8.98	-30	14.74	16.00	9
Women						
16–29 years	74.07	65.78	-11	73.68	65.02	-12
30–49 years	24.76	24.58	-1	25.93	33.98	31
50–80 years	23.59	22.95	-3	0.00	0.00	0
Men						
<i>Income by month</i>						
High income group (€2700 and above/month)	15.22	21.19	39	7.60	29.38	287 ^(*)
Medium income group	36.46	34.50	-5	31.42	34.24	9
Low income group (below €1350/month)	68.52	45.63	-33 ^{*,††}	45.56	67.20	47 ^(*)
Women						
<i>Income by month</i>						
High income group (€2700 and above/month)	100.00	25.50	-74	0.00	0.00	0
Medium income group	32.15	35.99	12	13.96	31.52	126
Low income group (below €1350/month)	56.65	50.61	-11	50.82	54.00	6
Non-heavy drinkers	<i>n</i> = 1286	<i>n</i> = 3106		<i>n</i> = 1204	<i>n</i> = 3085	
All	12.0	11.4	-5	10.9	10.8	-1
Men	14.0	13.8	-1	11.4	13.2	16
Women	10.3	9.2	-11	10.4	8.6	-17
Men						
16–29 years	26.84	37.81	41 ^{*,(†)}	36.57	34.84	-5
30–49 years	12.53	11.27	-10	9.84	11.33	15
50–80 years	7.16	3.11	-57 ^{*,††}	1.69	4.22	150 ^(*)
Women						
16–29 years	23.40	28.36	21 ^(†)	35.37	26.80	-24
30–49 years	7.45	6.01	-19	8.60	5.89	-31
50–80 years	5.62	1.40	-75 ^{*,††}	0.24	2.23	829 ^(*)
Men						
<i>Income by month</i>						
High income group (€2700 and above/month)	4.91	5.01	2	2.91	5.60	92
Medium income group	14.62	11.50	-21	9.22	8.94	-3
Low income group (below €1350/month)	17.63	28.35	61 [*]	23.39	28.61	22
Women						
<i>Income by month</i>						
High income group (€2700 and above/month)	5.21	6.46	24	0.00	7.48	-
Medium income group	9.40	6.09	-35 ^(*)	6.60	6.64	1
Low income group (below €1350/month)	12.29	14.35	17 ^(†)	16.74	11.48	-31 ^(*)

(*) $P < 0.10$, * $P < 0.05$, ** $P < 0.01$, (†) $P < 0.10$, † $P < 0.05$, †† $P < 0.01$. *Significantly different from 2003. †Change significantly different from that found in the control site. Results in this table should be interpreted with caution due to the small numbers in each group.

northern Sweden for the share of impaired control problems, but the difference in changes between men and women was not significantly different in the two sites. Also for extrinsic problems, the sexes in northern Sweden (but not in southern Sweden) behaved differently ($P < 0.01$), comparing 2003 with 2004–2006, and this change in northern Sweden was also significantly different from that found in southern Sweden.

Age groups

The changes in rates of impaired problems were significantly different in the oldest group (50–80 years old) in comparison with the youngest (16–29 years old) in both sites, although in opposite directions from each other. In southern Sweden,

problems decreased more in the oldest age group than among the youngest ($P < 0.01$), while in the north they increased more in the oldest group compared with the youngest. The difference in changes between these age groups was also significantly different between the two sites ($P < 0.0001$). No significant differences in changes between age groups were found for extrinsic problems.

Income groups

Among persons with a monthly salary of €2700 or more (high income), the number of persons reporting impaired problems had increased significantly more than among those earning less than €1350 each month (low income) in the northern site. But it was only with regard to extrinsic

Table 5. Proportion (%) reporting problems from alcohol before and after policy changes, by sex, age, income group among *high consumers* (highest 10% each year) and *non-heavy drinkers* (not highest 10%)

Extrinsic problems	South Sweden		North Sweden			
	Before	After	Change (%)	Before	After	Change (%)
High consumers (10%)	<i>n</i> = 139	<i>n</i> = 323		<i>n</i> = 132	<i>n</i> = 307	
All	28.8	16.7	-42** ^{††}	15.0	19.2	28
Men	29.0	15.4	-47** ^{††}	11.4	18.6	63 ^(*)
Women	27.8	21.8	-21	30.4	22.7	-25
Men						
16–29 years	54.55	30.92	-43** ^{††}	23.53	45.05	91*
30–49 years	20.32	11.86	-42	10.41	10.53	1
50–80 years	8.26	3.79	-54	3.37	1.84	-45
Women						
16–29 years	53.57	46.46	-13	50.00	42.55	-15
30–49 years	0.00	8.70	-	20.21	20.03	-1
50–80 years	0.00	0.00	-	20.68	0.00	-100 ^(*)
Men						
<i>Income by month</i>						
High income group (€2700 and above/month)	10.07	4.53	-55	7.60	1.24	-84
Medium income group	24.52	12.56	-49*	11.27	11.09	-2
Low income group (below €1350/month)	52.17	26.89	-48** ^{††}	16.26	43.37	167*
Women						
<i>Income by month</i>						
High income group (€2700 and above/month)	0.00	0.00	0	59.97	0.00	-100 ^(*)
Medium income group	25.03	7.45	-70	4.65	17.65	280
Low income group (below €1350/month)	31.60	48.26	53	52.77	37.29	-29
Non-heavy drinkers	<i>n</i> = 1286	<i>n</i> = 3106		<i>n</i> = 1204	<i>n</i> = 3085	
All	4.6	3.7	-20	3.9	3.5	-9
Men	4.7	4.4	-6	4.9	5.8	18
Women	4.5	3.0	33 ^(*)	2.9	1.5	-48 ^(*)
Men						
16–29 years	14.47	12.20	-16	15.91	19.77	24
30–49 years	1.71	3.24	89	3.16	3.45	9
50–80 years	1.37	1.21	-12	1.43	1.09	-24
Women						
16–29 years	13.82	9.58	-31	8.20	5.25	-36
30–49 years	2.20	1.31	-40	3.21	0.60	-81*
50–80 years	1.37	0.81	-41	0.00	0.47	-
Men						
<i>Income by month</i>						
High income group (€2700 and above/month)	0.68	2.81	313	3.91	2.08	-47
Medium income group	3.94	2.82	-28	2.53	3.06	21
Low income group (below €1350/month)	8.99	10.90	21	10.54	13.80	31
Women						
<i>Income by month</i>						
High income group (€2700 and above/month)	0.00	1.81	-	0.00	1.68	-
Medium income group	2.12	1.79	-16	1.35	0.90	-33
Low income group (below €1350/month)	6.56	4.76	-27	5.14	2.43	-53 ^(*)

(*) $P < 0.10$, * $P < 0.05$, ** $P < 0.01$, ^{††} $P < 0.01$. *Significantly different from 2003. [†]Change significantly different from that found in the control site. Results in this table should be interpreted with caution due to the small numbers in each group.

problems that the two sites changed significantly differently from each other by income group.

Consumption groups

There were no significant differences in changes observed for the two indices by consumption group, either within each site separately or between sites.

To conclude, the divergences between north and south were much stronger among men, where it was a matter of both the south decreasing and the north increasing, than among women. For impaired self-control but not for extrinsic problems, there was a tendency for women aged 16–29 years old to go against the overall change in the south. Younger men also showed a tendency towards moving in the same direction. For impaired problems, older men and women

showed the strongest divergence in the changes between the north and south, decreasing in the south and increasing in the north. For extrinsic problems, however, the social location of divergent changes was different. Extrinsic problems decreased (though not significantly) for women in both the north and the south. Among men, the social location of divergent changes was in younger men; in the southern site, fewer young men reported extrinsic problems in 2004–2006 than in 2003, while this finding was not revealed for extrinsic problems in the north. Low-income women (for impaired problems only) were the one quadrant of the population in which the comparison of changes was significantly different in the directions hypothesized: increasing in the south, while decreasing in the north. For low-income men, the comparison of changes was strongly significant in the opposite direction for extrinsic problems,

Table 6. Differences (%) in changes between population subgroups: comparisons between population subgroups within and between sites

Change (%) in southern Sweden	Change (%) in northern Sweden	The difference in change between sites	
Index 1: impaired control/dependence			
Sex			
Men (ref.)	-6	27*	
Women	-10	-15 [#]	
Age			
Young (16–29 years) (ref.)	10	-7	
Middle (30–49)	3	10	
Old (50–80)	-56**:#	103*:#	†
Income group			
Low (below €1350/month) (ref.)	13	4	
Middle	-18 ^(*)	3	
High	10	242*:#	(S)
Drinking group			
Highest 10% (ref.)	-15	29 ^(*)	
Others/not highest 10%	-5	-1	(S)
Index 2: extrinsic problems			
Sex			
Men (ref.)	-28*	39 ^(*)	
Women	-27	-43*:#	S
Age			
Young (16–29 years) (ref.)	-29*	21	
Middle	2	-26	(S)
Old	-36	-33	
Income group			
Low (below €1350/month) (ref.)	-17	15	
Mid	-33 ^(*)	8	
High	40	-62 ^(*) :(#)	S
Drinking group			
Highest 10% (ref.)	-42**	28	
Others/not highest 10%	-20	-9	(S)

(*) $P < 0.10$, * $P < 0.05$, ** $P < 0.01$, ([#]) $P < 0.10$, [#] $P < 0.05$, ^{##} $P < 0.01$, (^S) $P < 0.10$, (^S) $P < 0.05$, ([†]) $P < 0.0001$. *Changes (before versus after price and availability changes) within subgroup significantly different. [#]Changes in subpopulation significantly different from reference category within site. ^SDifference in changes between subpopulations (cat. vs. ref. cat.) significantly different in southern and northern Sweden.

and tended to rise more strongly in the north also for impaired problems. Even though the results given in Tables 4 and 5 should be interpreted with caution, they indicate that the north–south divergence in the ‘wrong’ direction seemed to be stronger among heavy drinkers than among others; this was particularly true among men in the low-income group and young men aged 16–29 years, as measured by both indices.

DISCUSSION

It should be emphasized that the overall rates of reported alcohol-related problems in the southern and northern parts of Sweden did not change, and certainly not in the direction expected in the original hypotheses of the Nordic tax study, although changes were observed in some population groups. Instead, as discussed in the paper on changes in consumption

in Sweden (Gustafsson, 2010), there seem to have been effects in the opposite direction to what was expected. Thus, even if the development in consumption and alcohol-related problems is not always parallel (Skog, 1987), it does not seem to have changed in accordance with expectations. The overall rates of problems decreased in both the south and north, but (marginally significantly) more in the south, contrary to the hypothesis in the Nordic tax study. For a couple of items (memory loss and alcohol harming the family), the changes were additionally significantly contrary to the hypothesis in the two sites.

In relation to self-reported consumption, the (significant) increases in consumption in the north shown by Gustafsson (2010) were matched by the alcohol-related problems according to both indices, although here the results were non-significant. The results presented for alcohol-related problems (significant for extrinsic problems) were also in accordance with the (non-significant) decrease found for consumption in the southern site. The increases in consumption found among men in the north seemed to be valid for self-reported alcohol-related problems as well, although when broken down by age group the relationship is not as clear.

Given the nature of the interventions, where the actual decrease in price took place in another country, the results imply that the price changes may have been too small to result in further increases in consumption and changes in rates of self-reported problems. According to Gustafsson (2010), spirits consumption in the southern site decreased by 13% (while it increased by 25% in the north). A change within Sweden may well have been more likely to give significant results in the expected direction, as price changes usually are expected to change the demand for alcohol (Chaloupka *et al.*, 2002). It is important to remember that there had already been great increases in alcohol consumption in the general population in the southern site before the tax reduction and quota changes (Boman *et al.*, 2006), and that before the policy reforms started in 1996—after entering into the EU—southern Sweden actually had the lowest consumption levels in Sweden, as well as the lowest share of binge drinkers and risk consumers (Kühlhorn *et al.*, 1999). Concerning the results in the northern site, where problems (as well as spirits consumption) were observed to have increased, the decreases in taxes in Finland may have had more influence across the border than expected, though municipalities closest to Finland were excluded from the sample.

What is shown here are two parallel changes in the opposite directions, but both occurring in Sweden. In southern Sweden, the decrease in reported problems (and consumption) could very well be related to a more ‘continental’ manner of drinking with meals during the working week rather than intoxication during the weekends, as also suggested by Bloomfield *et al.* (2010). In discussing various typologies of the cultural position of drinking, Room and Mäkelä (2000) ended up with four main approaches—one of them being banalized drinking, where drinking is more woven into daily life, as opposed to binge drinking occasions. The frequency of people who never binge drink has been shown to be increasing in Sweden (Ramstedt *et al.*, 2009); however, banalized drinking has been suggested to be practised especially by those living in the southern parts of Sweden and the amount consumed by binge drinkers

(referring to the past year) has also decreased in this site, but not in the north (Gustafsson, 2010). Yet, some alcohol-related harm can still be related to banalized drinking; Room and Mäkelä (2000) mentioned two examples: traffic casualties and liver damage. In fact, drunk driving was one of the two single problem questions in this study for which no decrease was observed in the southern site. In northern Sweden, on the other hand, problems (and consumption) were rising. It may be that there is a lagged effect in the northern site, such that the north is now catching up on the major increases in consumption that have already taken place in the south (Boman *et al.*, 2007). It has been suggested that alcohol consumption has reached a point of saturation in the south due to the rising consumption levels in this site (Gustafsson, 2010), although as Room *et al.* (2009) pointed out, there may be other explanations as well.

There are also differences between and by subgroups. In relation to Skog's theory of collective drinking (Skog, 1985), the present results do not seem to follow the predictions. If the extended version of Skog's original theory of the collectivity of drinking presented here was to hold true for alcohol-related problems, we would expect alcohol-related problems to increase/decrease evenly (relatively) or at least in the same direction by subgroups when policies change, or for that matter when there is a general societal change. When a policy change affects one site in a society but not another, we would expect a change in accordance with the policy. On the contrary, we observed rather that northern and southern Sweden were moving in opposite directions to those expected, and there were substantial variations in patterns of change between different population subgroups. Additionally, the difference in patterns of change between subgroups was not the same in the two sites. For the collectivity hypothesis to be supported, sub-populations too would need to be moving in the same direction, which is not the case here. In fact, how strongly the trends in two subgroups matches each other could be an indication of the extent to which they are part of a single collectivity with respect to drinking. Given the present results, clearly changes can happen in one part of a population and not in another. This has been shown by others as well (Midanik and Clark, 1995; Romelsjö and Diderichsen, 1989; Room, 1984; Sulkinen, 1981). As already mentioned, Skog (2001), in his response to comments by Gmel and Rehm (2000), allowed for subgroups to change differently when he retreats to a less strong position than in 1985, stating that there are exceptions to the overall pattern, for example, between the sexes and across different social-economic strata.

Norström and Romelsjö (1998) have suggested that social and cultural boundaries could hamper the overall collective process; the existence of several parallel drinking cultures in one society is not a new phenomenon (Ullman, 1958) and it has even been suggested that some population groups refuse adaptation to the mainstream drinking culture as a way of differentiating themselves (Room, 2005). Perhaps, then, northern and southern Sweden could be perceived as having two separate drinking cultures, which do not necessarily move together, although they are part of the same country. Skog was in fact never explicit about what the boundaries for collectivity and for cultural drinking networks were; although he most often used national data in his analysis, the collectivity he refers to is not necessarily that of a nation.

Additionally, further elaboration of the theory would call for an analysis of the extent to which habits in networks strive towards imitating each other, and under what circumstances habits are more likely to develop differentiating patterns.

Naturally, the present study has certain limitations; there is a risk that survey data will exclude some population groups that have been exposed to and affected by the interventions under investigation. Regarding these particular changes, travellers are an especially interesting group; if they travel often, they are more difficult to reach using telephone surveys. Another drawback of the surveys is that they may make it difficult to reach problem drinkers. Although analyses of these data show that those who are harder to reach do not differ a great deal from those who are easier to reach (Wennberg *et al.*, forthcoming), we cannot know whether those not responding to the survey differ from our sample. In terms of change in consumption, a significant increase was observed among heavy consumers and heavy consuming men (Gustafsson, 2010). We already know from earlier studies on alcohol surveys (Kühlhorn *et al.*, 1999) that high consumers are underrepresented in surveys. Thus, we cannot expect that our highest 10% will include everyone in the highest 10% in the Swedish population and accordingly we can assume that our group has a drinking less problematic. This can partially explain why the significant changes in a few subgroups among high consumers (highest 10%) in the southern area most often involved a decrease. A more plausible explanation may be that problems are a less precise measure than is the amount of consumption. Although I would argue that we should be able to get a crude measure of whether problems changed collectively, changes in problems may be harder to detect through surveys than are changes in consumption. Naturally, this is a problem with surveys, which is why register data can be useful. In fact, Gustafsson and Ramstedt (forthcoming) did note an increase in the number of alcohol poisonings (but not in the number of police-reported cases of drunk driving or violent assaults) in southern Sweden between January 2000 and December 2007 linked to the increased import quotas. Perhaps surprisingly, though, initial analysis in the study by Gustafsson and Ramstedt did not show an increase in alcohol poisonings or any of the other harms in the northern parts of Sweden. In a longer perspective, Ramstedt (2009) has reported increases in alcohol-related mortality and alcohol-related hospitalization among women, especially in the oldest age groups, and with regard to hospitalization also among the youngest groups (both men and women) in Sweden. Still, the analyses presented here, of relatively common problems in the general population and in subgroups of it, would not be possible with register data.

To conclude, self-reported problems did not increase in the south as was expected given the tax decrease in Denmark and increased quotas in Sweden. Instead, the patterns of change in problems were in accordance with the results already presented for alcohol consumption. It was also established that patterns of change in impaired self-control problems and extrinsic problems from drinking did not change collectively, as would be expected by a version of the collectivity theory of drinking originally brought forward by Skog (1985). Rather, there were variations in change between and within subgroups, both within and between regions. A substantial part of the divergence in the

'wrong' direction was related to what happened among the heavier drinkers, and particularly among men in the low-income group and younger male drinkers.

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APPENDIX: LISTING OF SINGLE ALCOHOL-RELATED PROBLEM ITEMS

During the last 12 months

Index 1: impaired self control/dependence

- have you felt that your drinking had a negative effect on your finances?
- have you found that you were not able to stop drinking once you had started?
- have you failed to do what was normally expected of you because of your drinking?
- have you needed a drink in the morning "to get going" after you had been drinking a lot the day before?
- have you had guilty feelings or a reproachful conscience because of your drinking?
- has it been impossible for you to remember what happened the night before because you had been drinking?
- have you regretted something you said or did after drinking?

Index 2: extrinsic problem

- has it happened that you, in connection with drinking, have had a quarrel (a heated discussion without a fight)?
- have you gotten into a fight when you have been drinking?
- has it happened that you have ridden with someone who was driving while under the influence of alcohol?
- has it happened that you have driven a car while under the influence of alcohol?
- have you felt that your drinking has harmed your work or studies?
- have you felt that your drinking has harmed your family or marriage?
- have you felt that your drinking has harmed your friendships or social life?
- has a relative or friend been disturbed about your drinking, or suggested you to cut down?
- have you or someone else been injured/have you caused an accident as a result of your drinking?

REFERENCES

- Andreasson S, Holder H, Norström T *et al.* (2006) Estimates of harm associated with changes in Swedish alcohol policy: results from past and present estimates. *Addiction* **101**:1096–105.
- Boman U, Engdahl B, Gustafsson N-K *et al.* (2006) *Alkoholkonsumtionen i Sverige fram till år 2005. Forskningsrapport nr. 39 [Alcohol Consumption in Sweden until the Year 2005. Research Report no. 39]*. Stockholm: SoRAD, SU.
- Boman U, Hradilova Selin K, Ramstedt M *et al.* (2007) *Alkoholkonsumtionen i Sverige fram till år 2006. Forskningsrapport nr. 48 [Alcohol Consumption in Sweden until the Year 2006. Research Report no. 48]*. Stockholm: SoRAD, SU.
- Bloomfield K, Rossow I, Norström T. (2009) Changes in alcohol-related harm after alcohol policy changes in Denmark. *Eur Addict Res* **15**:224–31.
- Bloomfield K, Wicki M, Gustafsson N-K *et al.* (2010) Changes in alcohol-related problems after alcohol policy changes in Denmark, Finland, and Sweden. *J Stud Alcohol Drugs* **71**:32–40.
- Cahalan D, Room R. (1974) *Problem Drinking among American Men*. New Brunswick, NJ: Rutgers Center of Alcohol Studies.
- Chaloupka FJ, Grossman M, Saffer H. (2002) The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Res. Health* **26**:22–34.
- Cook P. (1981) The effect of liquor taxes on drinking, cirrhosis and auto accidents. In: Moore M, Gerstein D (eds). *Alcohol and Public Policy: Beyond the Shadow of Prohibition: Panel on Alternative Policies Affecting the Prevention of Alcohol Abuse and Alcoholism*. Washington, DC: National Academy Press, 255–85.
- Cook P, Tauchen G. (1982) The effect of liquor taxes on heavy drinking. *Bell J Econ* **13**:379–90.
- Cook P, Ostermann J, Sloan F (2005) *Are alcohol excise taxes good for us? Short and long-term effects on mortality rates*. Working Paper 11138. Cambridge, MA: NBER Working Paper Series.
- Gmel G, Rehm J. (2000) The empirical testability of Skog's theory of collective drinking behaviour. *Drug Alcohol Rev* **19**:391–9.
- Gmel G, Rehm J, Room R *et al.* (2000) Dimensions of alcohol-related social and health consequences in survey research. *J Subst Abuse* **12**:113–38.
- Gustafsson N-K. (2010) Alcohol consumption in southern Sweden after major decreases in Danish spirits tax and increases in traveller's quotas. *Eur Addict Res* **16**:152–61.
- Gustafsson N-K, Ramstedt M. (forthcoming) Changes in alcohol-related harm in Sweden after increasing alcohol import quotas and a Danish tax decrease - an interrupted time-series analysis for 2000–2007. *Int J Epidemiol*.
- Gustafsson N-K, Trolldal B. (2004) *Svenska folkets alkoholkonsumtion under år 2003. Forskningsrapport nr. 26 [The Alcohol Consumption of the Swedish Population during the Year 2003. Research Report no. 26]*. Stockholm: SoRAD, SU.
- Heeb J-L, Gmel G, Zurbrugg C *et al.* (2003) Changes in alcohol consumption following a reduction in the price of spirits: a natural experiment in Switzerland. *Addiction* **98**:1433–46.
- Herttua K, Mäkelä P, Martikainen P. (2008a) Changes in alcohol-related mortality and its socioeconomic differences after a large reduction in alcohol prices: a natural experiment based on register data. *Am J Epidemiol* **168**:1110–8.
- Herttua K, Mäkelä P, Martikainen P *et al.* (2008b) The impact of a large reduction in the price of alcohol on area differences in interpersonal violence: a natural experiment based on aggregated data. *J Epidemiol Commun H* **62**:995–1001.
- Herttua K, Mäkelä P, Martikainen P. (2009) An evaluation of the impact of large reduction in alcohol prices on alcohol-related and all-cause mortality: time series analysis of a population-based natural experiment. *Int J Epidemiol* 1–14; doi: 10.1093/ije/dyp336 (epub ahead of print).
- Hradilova Selin K. (2004) Inledning – bakgrund, undersökningsdesign och metod [Introduction – Background, Research Design and Method]. In Hradilova Selin K. (ed), *Svenska dryckesvanor och deras konsekvenser i början av det nya millenniet Forskningsrapport nr. 20 [Swedish Drinking Habits and Their Consequences in the Beginning of the New Millennium Research Report No. 20]*, Chapter 1, Stockholm: SoRAD, SU, 5–21
- Koski A, Sirén R, Vuori E *et al.* (2007) Alcohol tax cuts and increase in alcohol-positive sudden deaths—a time-series intervention analysis. *Addiction* **102**:362–8.
- Kühlhorn E, Hibell B, Larsson S *et al.* (1999) *Alkoholkonsumtionen i Sverige under 1990-talet [Alcohol Consumption in Sweden during the 1990's]*. Stockholm: Oberoende alkoholsamarbetet [Independent alcohol collaboration] (OAS).
- Leifman H, Gustafsson N-K. (2003) *En skål för det nya millenniet En studie av svenska folkets alkoholkonsumtion i början av 2000-talet. Forskningsrapport nr. 11 [A Toast for the New Millennium A Study of the Alcohol Consumption in the Swedish Population at the Beginning of the 21st Century. Research report No. 11]*. Stockholm: SoRAD, SU.
- Mann R, Smart R, Anglin L *et al.* (1988) Are decreases in liver cirrhosis rates a result of increased treatment for alcoholism? *Br J Addict* **83**:683–8.

- Midanik LT, Clark WB. (1995) Drinking-related problems in the United States: description and trends, 1984–1990. *J Stud Alcohol* **56**:395–402.
- Mohler-Kuo M, Rehm J, Heeb J-L *et al.* (2004) Decreased taxation, spirits consumption and alcohol-related problems in Switzerland. *J Stud Alcohol* **65**:266–73.
- Mäkelä P, Österberg E. (2009) Weakening of one more alcohol control pillar: a review of the effects of the alcohol tax cuts in Finland in 2004. *Addiction* **104**:554–63.
- Mäkelä P, Bloomfield K, Gustafsson N-K *et al.* (2007) Effects of major changes in alcohol availability: study design, data collection procedures and measurement. SoRAD Research Report no. 46. Stockholm: SoRAD, SU.
- Mäkelä P, Bloomfield K, Gustafsson N-K *et al.* (2008) Changes in volume of drinking after changes in alcohol taxes and travellers' allowances: results from a panel study. *Addiction* **103**:181–191.
- Norström T. (2001) Per capita consumption and all-cause mortality in 14 European countries. *Addiction* **96**:113–28.
- Norström T, Romelsjö A. (1998) Social class, drinking and alcohol-related mortality. *J Subst Abuse* **10**:385–95.
- Ramstedt M. (2009) Alkoholkonsumtion och skadeutveckling i Sverige 1995–2007 [Alcohol consumption and development in harms in Sweden 1995–2007]. In *Missbruk och behandling: Gamla problem – nya lösningar? [Misuse and Treatment: Old Problems – new solutions?]*. Stockholm: Forskningsrådet för arbetsliv och socialvetenskap (FAS, Swedish Council for Working Life and Social Research): 8–15.
- Ramstedt M, Axelsson Sohlberg T, Engdahl B *et al.* (2009) Tal om alkohol 2008: En statistisk årsrapport från Monitor-projektet. [Talk about/Figures of alcohol 2008: A statistical yearly report from the Monitoring Study] Research Report No. 54. Stockholm: SoRAD, Stockholm University.
- Romelsjö A. (1989) The relationship between alcohol consumption and social status in Stockholm. Has the social pattern of alcohol consumption changed? *Int J Epidemiol* **18**:842–51.
- Romelsjö A, Diderichsen F. (1989) Changes in alcohol-related inpatient care in Stockholm county in relation to socioeconomic status during a period of decline in alcohol consumption. *Am J Public Health* **79**:52–6.
- Room R. (1984) "A reverence for a strong drink": The lost generation and the elevation of alcohol in American culture. *J Stud Alcohol* **45**:540–6.
- Room R. (2000) Concepts and items in measuring social harm from drinking. *J Subst Abuse* **12**:93–111.
- Room R. (2005) Multicultural contexts and alcohol and drug use as symbolic behaviour. *Addict Res Theory* **13**:321–31.
- Room R, Hradilova Selin K. (2004) Alkoholproblem – definitioner, metoder, data [Alcohol-problems – definitions, methods, data]. Chapter 4 In Hradilova Selin K. (ed) *Svenska dryckesvanor och deras konsekvenser i början av det nya millenniet Forskningsrapport nr. 20 [Swedish Drinking Habits and Their Consequences in the Beginning of the New Millennium Research Report No. 20]*. Stockholm: SoRAD, SU, 57–74
- Room R, Mäkelä K. (2000) Typologies of the cultural position of drinking. *J Stud Alcohol* **61**:475–83.
- Rootman I, Moser J. (1984) *Community Responses to Alcohol-Related Problems: A World Health Organization Project Monograph*. DHHS Publication (ADM). Rockville, MD: National Institute on Alcohol Abuse and Alcoholism, 85–1371.
- Room R, Romelsjö A, Mäkelä P. (2002) Conclusion impacts of alcohol policy: the Nordic experiences. In Room R. (ed) *The Effects of Nordic Alcohol Policies. What Happens to Drinking and Harm When Alcohol Controls Change? NAD Report 42*, Chapter 10. Helsinki, Finland: Nordiska nämnden för alkohol och drogforskning (NAD), 167–174.
- Room R, Österberg E, Ramstedt M *et al.* (2009) Explaining change and stasis in alcohol consumption. *Addict Res Theory* **17**:562–76.
- Skog O-J. (1985) The collectivity of drinking cultures. A theory of the distribution of alcohol consumption. *Brit J Addict* **80**: 83–99.
- Skog O-J. (1987) Trends in alcohol consumption and deaths from diseases. *Br J Addict* **82**:1033–41.
- Skog O-J. (2001) Commentary on Gmel and Rehm's interpretation of the theory of collectivity of drinking culture. *Drug Alcohol Rev* **20**:325–31.
- Smart R, Mann R. (1991) Factors in recent reductions in liver cirrhosis deaths. *J Stud Alcohol* **52**:232–40.
- Smart R, Mann R. (1993) Recent liver cirrhosis declines: estimates of the impact of alcohol abuse treatment and alcoholics anonymous. *Addiction* **88**:193–198.
- Smart R, Mann R, Suurvali H. (1998) Changes in liver cirrhosis death rates in different countries in relation to per capita alcohol consumption and alcoholics anonymous membership. *J Stud Alcohol* **59**:245–249.
- Sulkunen P. (1981) The wet generation: living conditions and drinking patterns in Finland. Continuities in a reanalysis of Finnish drinking survey data. Continuities in a reanalysis of Finnish drinking survey data. Helsinki: Reports from the Social Research Institute of Alcohol Studies. No. 155. Finland: Iaiko.
- Ullman A. (1958) Sociocultural backgrounds of alcoholism. *Ann Am Acad Pol Soc Sci* **315**:48–54.
- Wagenaar A, Maldonado-Molina M, Wagenaar B. (2009) Effects of alcohol tax increases on alcohol-related disease mortality in Alaska: time-series analyses from 1976 to 2004. *Am J Public Health* **99**:1464–70.
- Wennberg P, Svensson J, Ramstedt M. (forthcoming) The effects of missing data in a random digit dialling survey of alcohol habits.
- Wicki M, Gustafsson N-K, Mäkelä P *et al.* (2009) Dimensionality of drinking consequences: cross-cultural comparability and stability over time. *Addict Res Theory* **17**:2–16.