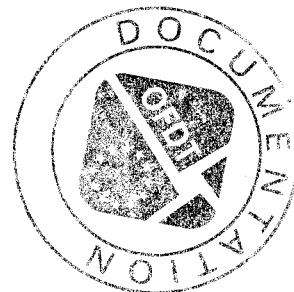


An EU – Concerted Action

Gender, Culture and Alcohol Problems: A Multi-national Study

Project Final Report
January 2005



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The consortium

Contents

INTRODUCTION	11
CHAPTER 1: DATA CENTRALIZATION.....	23
CHAPTER 2: DRINKING PATTERNS	49
Drinking and gender differences in drinking in Europe. A comparison of drinking patterns in European countries.	
CHAPTER 3: DRINKING CONTEXTS	73
Drinking contexts in European countries.	
CHAPTER 4: ALCOHOL-RELATED PROBLEMS	89
The Alcohol Use Disorder Identification Test (AUDIT) in general population surveys in European countries: a first evaluation of the reliability.	
CHAPTER 5: ALCOHOL-RELATED VIOLENCE	103
A comparison of alcohol related aggression in six European countries.	
CHAPTER 6: SOCIAL INEQUALITIES.....	117
Social inequalities in alcohol consumption and alcohol-related problems in the study countries.	
CHAPTER 7: SOCIAL ROLES	137
How do social roles and social stratification influence women's and men's alcohol consumption? A cross-cultural analysis..	
CHAPTER 8: SOCIETAL-LEVEL FACTORS	163
The influence of societal-level factors on men's and women's alcohol consumption and alcohol problems.	
ANNEX: COUNTRY REPORTS	189
APPENDIX A1: RECOMMENDATIONS FOR THE USE OF DRINKING INDICATORS	218
APPENDIX A2: HOW TO READ THE CODEBOOK?	229
APPENDIX A3: CODEBOOK (QUESTIONS ONLY)	245
APPENDIX A4: DESCRIPTION OF DRINKING INDICATORS	280
APPENDIX A5: DOCUMENTATION FOR VARIABLE NAMES OF DRINKING INDICATORS (8 CHARACTERS)	320
APPENDIX A6: OVERVIEW WORKDECKS	322
APPENDIX A7: SAMPLING DESIGN QUESTIONNAIRE.....	327
APPENDIX B: DRINKING CONTEXTS	332
APPENDIX C: ALCOHOL-RELATED VIOLENCE	335
APPENDIX D: SOCIAL INEQUALITIES	340
APPENDIX E: SOCIETAL-LEVEL FACTORS.....	341

Introduction

Kim Bloomfield

1 BACKGROUND

The gender gap in drinking behaviour is one of the few universal gender differences in human social behaviour. In general population studies throughout the world, as compared to women, men are more often drinkers, consume more alcohol, and cause more problems by doing so (Almeida et al., 2004; Fillmore et al., 1991; Hao et al., 2004; Jhingan et al., 2003; Kebede & Alem, 1999; McKee et al., 2000; Perdrix et al., 1999; Rijken et al., 1998; Sieri et al., 2002; Yamamoto et al., 1993). However, the size of these gender differences varies greatly from one society to the other. Neither the universality nor the variability of these gender differences has been adequately explained (R. Wilsnack et al., 2000).

Gender differences in alcohol use can be seen as one way in which societies have symbolised and regulated gender roles. Cultural differences in normative drinking patterns help to reveal how (and to what extent) societies differentiate gender roles, for example, by making drinking behaviour a demonstration of masculinity (Campbell, 2000; Driessen, 1992; MacDonald, 1994; Roberts, 2004) or by an expectation that women abstain from alcohol or curb their consumption as a symbol of subservience or to prevent sexual autonomy (Martin, 2001; Nicolaides, 1996; Willis, 1999). Therefore, better understanding of how men's and women's drinking patterns differ is an important key to answering broader questions of how and why and to what extent societies try to get women and men to behave differently (Gefou-Madianou, 1992; McDonald, 1994; Murdock, 2002; Wilsnack & Wilsnack, 1997).

Gender differences in alcohol use have bolstered costly biases in how societies identify and try to control alcohol-related problems. On the one hand, the association of heavy drinking with displays of masculinity or male camaraderie may encourage male drinkers to deny or minimize problems or risks resulting from their drinking, or to regard drunken behaviour as normal or permissible, even when it leads to violence (Graham & Wells, 2003; Greenfield & Rogers, 1999; Tomsen, 1997). On the other hand, assumptions that women do not drink heavily may initially lead to women's drinking problems being minimized or ignored (for example, by medical practitioners; Brienza & Stein, 2002; Svikis & Reid-Quinones, 2003; Weisner & Matzger, 2003), but when women's alcohol abuse or dependence becomes conspicuous, the social reaction may shift from indifference to outrage and efforts to punish women who drink in socially disapproved ways (Abel & Kruger, 2002; Blume, 1997; De Ville & Kopelman, 1998; McLaughlin, 1991).

A step in improving understanding of how gender and culture combine to affect alcohol use and abuse has been undertaken by the concerted action "Gender, Culture and Alcohol Problems" funded by the European Commission (contract QLG4-CT-2001-01496) which has examined differences in drinking behaviour amongst men and women in 13 European and two non-European countries. By examining gender differences in alcohol use amongst several European countries, this project provides a unique opportunity to focus on a part of the world which contains an interesting spectrum of countries with

regard to gender equality. Several Nordic countries, which are among those with a very high degree of gender equality, have been included in the study. The project, though, has attempted to represent most regions of the European Union, and in addition, has two non-European countries. Thus, with such a spectrum of levels of gender equality among various societies, the project has had the promise to reveal how gender differences in drinking behaviour may be linked to the level of gender equality in a country.

Important features of this study have been the use of centralised data analysis and standardised measures. With these, the project has made a step to improve upon previous international and European alcohol research with the goal to better inform European public health policy. This is done by identifying gender differences in "at-risk" subgroups and by seeking to better specify and understand the differing correlates and conditions of problematic alcohol use between the genders, not only on the individual level but on the societal level as well.

The successfully completed precursor to this project, the concerted action "Alcohol consumption and alcohol problems in European countries" (Biomed II Programme, contract numbers BMH4-CT-96-0179 and IC20-CT96-0051) (Ahlström et al, 2001; Allamani et al, 2001; Bloomfield et al, 2001; Cipriani et al, 2001, Gmel et al, 2000; Knibbe & Bloomfield, 2001; Plant et al, 2000), also investigated determinants of women's alcohol consumption as well as gender differences in alcohol use across nine European countries. This completed study was a solid first step in devoting research attention to women's drinking behaviour and gender differences in alcohol consumption across a number of European countries. The limitations of that study, however, were that (1) a rather small number of countries were available to represent the main drinking cultures found in Europe, (2) the main focus of the project was on women's drinking behaviour and gender differences were not systematically examined, (3) previously collected data sets were used for the analysis, where the number of commonly measured variables was rather limited, especially in measuring alcohol-related problems, and (4) the data were not analysed centrally but by the individual study partners.

Such challenges experienced by the previous study have been addressed in the present study, thereby giving it a more robust design. This has been done, first, by increasing the number of study countries. The current project includes the study countries of Austria, Czech Republic, Finland, France, Germany, Hungary, Israel, Italy, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom. In addition, two countries outside of Europe, Brazil and Mexico, have participated in the study¹, as has the World Health Organisation (WHO) in an advisory capacity. This wider range of societies has aided in conducting more reliable analyses and in corroborating gender differences in drinking behaviour. The second challenge, to widen the examination to gender differences in drinking behaviour, has been met by the inclusion of data sets which contain information on both men and women in all study countries. The third challenge experienced in the previous concerted action, that of the relatively few directly comparable original variables available for secondary analysis, is corrected by the extensive efforts of the partners of the current study to collect fresh data with standard measures for the main variables of interest. This has been achieved through consultations among the study partners and colleagues in our sister project "GENACIS" (see below) to develop a recommended

¹ It was originally planned that Canada, the United States and Russia would also participate. However, due to international juridical and contractual hurdles, these countries had to withdraw.

set of standard questions to be applied in new data collecting efforts. Finally, in contrast to the previous concerted action, where data for each specific research question were analysed either by the research task co-ordinator responsible or by the study partner, the current data have been centralised and analyses were carried out centrally with the professional guidance of the project's data bank coordinator in Lausanne, Switzerland. This has improved the degree of uniformity, reliability and validity of the results.

The current project has been affiliated with a larger international research endeavour, entitled "GENACIS" (Gender, Alcohol, and Culture: An International Study). This is a larger, ongoing project that is investigating gender differences in alcohol use and misuse across a larger range of countries much beyond those in Europe. Thus, aside from the countries involved in the current EU concerted action, the GENACIS study countries include Argentina, Australia, Belize, Canada, Costa Rica, Denmark, Iceland, India, Ireland, Japan, Kazakhstan, Nicaragua, Nigeria, Peru, Russia, Spain, Sri Lanka, Switzerland, Uganda, Uruguay, and the United States. Participation of these countries is funded through the U.S. National Institute on Alcohol Abuse and Alcoholism (Research Grant No. R21 AA12941) and the World Health Organisation with funding earmarked for developing countries. Through this opportunity to collaborate with a larger, more comprehensive study, a common "core" questionnaire was developed for implementation in those countries planning to collect new survey data. It was encouraged that each study use as much if not all of this new questionnaire. However, if surveys were financed by national governments or health agencies, it was often the case that other priorities existed in what kind of health data would be collected, and in some cases only a selection of items from the project's core questionnaire could be included. Nevertheless the use of a standardised questionnaire represents a significant step forward in unifying alcohol survey data within Europe.

2 RESEARCH OBJECTIVES

The specific research objectives of the present concerted action "Gender, Culture and Alcohol Problems" have been:

1. To compare within countries men's and women's drinking patterns and drinking contexts; to compare across countries men's and women's drinking patterns and contexts, and gender differences in drinking patterns and contexts. Previous international studies have compared men's and women's drinking patterns by constructing common reporting units from existing survey data. But, different countries have used different questions, response categories, and assumptions in past surveys, limiting the ability of researchers to derive comparable measurements of drinking. Where it has been possible, the current study has collected data based on the same methods of measuring drinking behaviour which allows comparisons to be analysed more directly and offers a new and more informative source of data on alcohol consumption for reference use in the European Union. Additionally, analyses have included examining gender differences in drinking contexts. Research has shown that the time, place and person with whom one consumes alcohol influence the amount consumed and possibly the amount of risk carried by such a drinking situation. To our knowledge, this is one of the first studies to examine drinking contexts and gender differences in drinking contexts internationally.

2. To compare within countries men's and women's alcohol-related problems, to compare across countries the prevalence of men's and women's alcohol problems, and gender differences in problem prevalence. Such comparisons have been difficult across countries because countries typically have looked most closely at somewhat different lists of behavioural problems and symptoms of alcohol dependence. Apart from methodological studies such as those for developing the AUDIT (Alcohol Use Disorders Identification Test) questionnaire, our current analyses are among the first cross-national comparisons of prevalence rates, particularly for comparing women's and men's experiences. As in the case of measuring alcohol consumption, efforts to use of a standard instrument across the study countries have offered a new and informative source of data on alcohol abuse and alcohol dependence for reference use in the European Union.

3. To compare, within countries and across countries, the experience of violence in close relationships as related to men's and women's drinking behaviour. Although the involvement of alcohol in violent crime varies, it has been estimated that on average 50% of violent crimes involve drinking by the offender, the victim or both. One area of particular significance for understanding the role of alcohol is violence between intimates, because most violence against women occurs in the context of an intimate relationship. Fairly consistent findings indicate that marital aggression is associated with heavier drinking, particularly high quantity per occasion, for both men and women. The current study has examined both this relationship and alcohol-related violence in general in those study countries which have gathered specific data on this question.

4. To compare, within countries and across countries, gender differences in social inequalities in alcohol use and abuse, and to compare gender differences in the influence of combinations of social roles on heavy use. Social inequalities in alcohol use and abuse. Few studies have explicitly examined social inequalities in alcohol use and abuse in detail. However, most general studies that have investigated the influence of socio-economic factors on alcohol use have found a relationship opposite to that found in the general health inequalities literature; i.e., those with lower SES (e.g., education, profession) are more often abstainers from alcohol. Moreover, some studies have also found that women of higher SES tend to report more alcohol-related problems and symptoms and consume more alcohol than women of lower SES. Since such research has been quite limited, the current study has systematically examined the unique nature of social inequalities in alcohol use and abuse and the gender differences across the study countries. Social roles. Previous research suggests that heavy drinking and alcohol-related problems are associated with having few social roles and responsibilities rather than having many roles to perform, but in general this appears to be more relevant for men than for women. Recent findings from the precursor study point to intriguing differences in the combinations of social roles associated with heavy drinking among women in five different European countries, suggesting that a uniform "risk" profile for hazardous drinking does not exist across Europe. Information on how men and women combine family and work roles is important for understanding the development of drinking patterns and the adverse effects of alcohol consumption. The current study has gone beyond its precursor to examine what combinations of social roles for both men and women are related to higher risk for hazardous alcohol use and abuse.

5. To analyse how societal-level factors (e.g., gender equality, drinking culture norms) predict women's and men's alcohol use and alcohol-related problems in various regions of Europe and elsewhere. Over the several decades of international alcohol research, it has become well known that differing drinking cultures exist. Moreover, gender and political science research have attempted to characterise the world's countries by the social position of women to aid in specifying the development of gender-relevant policies. These two societal-level dimensions, drinking culture and the social position of women, have particular relevance in helping to explain, on a "higher" level, the results found in an international study. The diversity of countries in our project and our affiliate GENACIS project have allowed analyses of societal characteristics (a) as possible predictors of patterns of men's and women's alcohol consumption and related problems across societies, and (b) as possible modifiers of associations with individual-level predictors, for women and men in each society studied. This information is informative in helping to develop a social and health policy within the European Union which can be more regionally, culturally and gender-sensitive.

3 SUMMARY OF KEY RESULTS

Below is summary of the key results of the analyses conducted to answer the above-mentioned main research objectives of the study. Chapters 2 and 3 are related to our first research objective, that of examining the drinking patterns and drinking contexts across countries; Chapter 4 is the product of the analyses conducted to answer our second objective of comparing the experience of alcohol-related problems across countries. Chapter 5 deals with examining alcohol-related violence, the subject of our third research objective, while Chapters 6 and 7 report on the findings of our fourth objective regarding social inequalities in alcohol consumption and alcohol-related problems and cultural differences in how social roles and social stratification are related to alcohol consumption. Finally, Chapter 8 takes a comprehensive view of how societal-level factors, in particular gender equality and also modernisation, are correlated with drinking behaviour on an international level, our fifth research objective.

Preceding these chapters is a detailed section (Chapter 1) which describes the data centralisation procedures and other methodological aspects of the study including the construction of common variables used in the centralised data analyses.

An additional report is included as an annex. It contains in-depth profiles of selected study countries (Austria, Finland, France, Germany, Italy and the United Kingdom) with regard to other descriptive alcohol-related data available for examination. These reports were compiled as an aid to the reader to help interpret the quantitative results found in the preceding chapters and as a possible launching point for more qualitative studies of gender differences in drinking behaviour in the future.

Drinking patterns

The purpose of this chapter was to compare drinking habits and to examine differences between drinking cultures in different regions and countries of Europe; to examine gender differences in drinking habits and to compare them over countries and drinking cultures.

- Clear gender ratios exist for all drinking measures (except wine drinking) and ratios were larger the more extreme the behaviour (e.g., heavy episodic drinking, abstinence).
- Country and regional differences were less clear: no country represented an “ideal type” of drinking culture. Nonetheless, in general there was more daily light drinking integrated into everyday life in the Mediterranean countries and more heavy episodic drinking connected with weekends and celebrations in the North.
- Gender differences for engagement with alcohol and frequency of drinking were smaller in the Nordic countries.
- Gender ratios did not seem to change systematically with age, except that there was less difference between young men and women than between older men and women with regard to heavy episodic drinking.

Drinking contexts

The aim of this chapter was to compare the prevalence of different drinking contexts and to compare gender differences in the drinking contexts in selected European countries. The research questions to be answered were: (1) Is drinking most integrated into social activities in Southern European countries, less integrated in Central European countries and least integrated in the Nordic countries? (2) Is the pattern of integration similar for both genders, independent of the level of the drinking frequency in that country? (3) Is age associated with drinking contexts in a similar way in all study countries?

- In general, in Southern Europe drinking was found to be integrated into many social activities. In Central European countries the degree of integration of drinking was lower, but higher than in the Nordic countries.
- In most study countries, the pattern of integration was similar for both genders. However, in the Czech Republic and in Hungary, workmates were more often favoured by men as a drinking companion than was the spouse. In these countries, drinking seems to be more related to men's social life rather than domestic life, as in the other study countries.
- In all study countries, age was partly related to drinking contexts in a similar way. The youngest age group did not report drinking at a meal and at home as often as the older groups, but they drank more often at parties, bars and with their friends. As age increased the importance of the spouse as a drinking companion increased.
- The degree of gender similarity in drinking patterns varied between study countries. The gender ratios in drinking context variables were very low in Iceland, Norway, and Sweden. They were of medium size in Finland, Germany, the Netherlands, and the United Kingdom, and highest in the Czech Republic and Hungary.

Alcohol-related problems – a validity test of the AUDIT in European countries

The purpose of this chapter was to examine the AUDIT (Alcohol Use Disorders Identification Test) with respect to the following questions: (1) what differences are there between countries on the items constituting the AUDIT and which gender differences are there within countries on these items?, (2) Do countries differ in the extent to which the set of items constitute a (statistically) reliable scale?, and

(3) Do countries differ in how the drinking indicators used in the AUDIT contribute to the reliability of the AUDIT?

- On the item level there are large differences between countries in how many suffer from the consequences measured by the AUDIT.
- In all countries a higher proportion of men report problems than women.
- There was variation in gender ratios among the individual items of the AUDIT with behavioural items having larger ratios than more “internally subjective” items.
- The variation over countries in pattern of responses to the items indicates that a relatively small set of problems included in the AUDIT is responsive to national differences in problem drinking.
- The gender sensitivity of the AUDIT should be examined further in future research.

Alcohol-related aggression

The aim of this chapter was to assess the relationship between alcohol consumption, gender and aggression across different countries. It was hypothesised that (1) heavy drinkers will be more likely than lighter drinkers to report alcohol-related aggression among both men and women, and (2) men will be more likely to engage in alcohol-related aggression than women.

Partner aggression:

- Alcohol consumption is related to partner aggression, with current drinkers more likely to report aggression than abstainers and heavy drinkers more likely to report partner aggression than non-heavy drinkers.
- Heavy drinkers are more likely to report aggression and getting into fights, among both men and women and across all countries.
- Partners of heavy drinkers are also more likely to report aggression.
- Aggression appears to be related to younger age.

General violence:

- The proportion of those becoming more aggressive when drinking is much higher for heavy drinkers than non-heavy drinkers, among both men and women and across countries.
- In general more men than women were likely to report aggressive behaviour
- The prevalence of getting into a fight when drinking was much higher for heavy drinkers than non-heavy drinkers.
- There is also a large and consistent effect within countries for men to get into a fight when drinking more often than women.
- No pattern of alcohol-related violence could be discerned among the study countries. This is most likely because the number of countries involved is small and because the measurement instrument varied across study countries.
- It is important to remember that these associations are correlational and do not prove a causative role of alcohol in aggression.

Social inequalities in drinking behaviour

The purpose of this chapter was to determine whether social inequalities exist in alcohol use and abuse among men and women in the study countries, and if there are differences in these inequalities between the genders and across countries.

- In general the same patterning of inequalities exists for drinking status among both men and women within a given country.
- For heavy drinking, the genders diverge and in several countries higher educated women are those most likely to drink heavily, while among men there are several countries in which the lower educated are more at risk.
- For heavy episodic drinking, no real social differences were evident among women in the study countries, but in several countries a social gradient was observable with lower educated men more at risk for heavy episodic drinking than higher educated men.
- This same patterning was also found for reported alcohol-related problems for five of the study countries.

Social roles and social stratification

The purpose of this chapter was to investigate the following questions in relation to the prevalence of various measures of drinking behaviour: (1) Is social stratification more important for men, whereas family roles are more important for women?, (2) Does the same multiple role hypothesis apply for men and women?, (3) Are there country differences with regard to the impact of social stratification and multiple roles on alcohol consumption?, (4) Can these differences be explained by structural variables at the aggregate level, such as gender equity?

- Social stratification is not the sole determinant of drinking behaviour among men, and family roles are not only important for women, but also for men.
- No single role theory was consistently supported across all countries or within a country for both genders.
- As compared to men, women of higher education seem to be more at risk to drink heavily and employed women are more at risk for heavy episodic drinking. However, these tendencies were less apparent in the Nordic countries.
- It appears that in almost all countries, women without children were relatively more vulnerable for heavy drinking and heavy episodic drinking compared to men.
- Differences between countries appear to be explained partly by macro-level factors such as how well developed the social welfare system of a country is and how much gender equity exists in a country.

Societal-level factors

This chapter examined the similarities and differences in men's and women's rates of alcohol consumption and problems, and their association with other societal-level characteristics of 29 countries.

- In all countries the prevalence of drinking was higher for men than for women.
- Among current drinkers men had higher rates than women of weekly drinking, of heavy episodic drinking and of consuming high volume of alcohol per year.
- The prevalence of current drinking was strongly correlated with economic development: the higher the per capita income and its correlates (urbanisation, divorce rates, low fertility), the higher the rate of current drinking for both men and women. This, however, did not hold for indicators of intensity of drinking.
- Men's liver cirrhosis mortality was negatively associated with indicators of modernisation and economic development. This was not the case for women's cirrhosis. Death rates from vehicle crashes were negatively correlated with modernisation, and this was stronger for men than women.
- The more modernized a country, the lower the difference in current drinking rates between men and women. This, however, did not hold for measures of intensity of drinking.
- Likewise, the more gender equity in a country, the lower the difference between men and women in current drinking rates and measures of alcohol consequences. Again, this did not hold for measures of intensity of drinking.

4 CONCLUDING REMARKS AND CONSIDERATIONS FOR FUTURE RESEARCH

The results reported in this study confirm the very clear existence of gender differences in drinking behaviour amongst 12 European and two non-European countries. Although this finding is not new, it has become apparent through our research that there are indeed factors which influence the degree and nature of these differences across the various countries. One of the most noticeable factors observed has been that the more gender equality exists in a country, the smaller the gender differences in drinking behaviour. This finding can be seen in particular in the results presented in Chapter 2 (Drinking patterns), Chapter 3 (Drinking contexts in European countries), Chapter 6 (Social inequalities in alcohol consumption and alcohol-related problems), Chapter 7 (How do social roles and social stratification influence women's and men's alcohol consumption?), and Chapter 8 (The influence of societal-level factors on men's and women's alcohol consumption and alcohol problems). In most cases we find that the smallest gender differences in drinking behaviour can be found in the Nordic countries, followed by western and central European countries, in the analyses conducted in this concerted action.

At first glance, this finding may appear banal. But it is a finding which reoccurs throughout the present study with differing analysis techniques and with varying groups of study countries. This, firstly, can confer a measure of validity and credibility; thus it appears to be a valid finding. Secondly, to observe that the "gender gap" in drinking behaviour is related to the gender equality of a society is interesting in so far that one may then begin to hypothesise or look for confirmation of similarities in other social and health behaviours (e.g., nutrition, smoking, other life style factors). It would indeed be interesting to know which behaviours are influenced by or correlated with gender equality and which are not (and ultimately why not). Finally, our results do not tell us in any detail how gender differences in drinking behaviour decrease. Is it because women are drinking more in the countries where the differences are smaller, or alternatively, are the differences smaller because men happen to be drinking less or

experiencing fewer problems? This is indeed an important question that has implications for future alcohol and public health policy in that it is crucial to know who may be drinking more or less when gender differences converge. We hope our study provides an interesting and provocative point of departure for European alcohol researchers, as well as alcohol researchers in general, from which to conduct future studies that can take these considerations into account.

5 A NOTE ON AUTHORSHIP

The first author of each chapter has been the coordinator (or in the case of Chapters 3 and 7, sub-coordinator) for that particular "work package" that contained the relevant research objective. Additional authors listed in a particular chapter represent other colleagues at the coordinator's institute, other consortium colleagues or colleagues of the broader GENACIS project who contributed substantially to the chapter report.

All partners of this concerted action, however, have been involved in the preparation of this report. At various stages of the project, they have given crucial feedback and additional information for the accurate interpretation of the data and analyses pertaining to their countries.

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Chapter 1

Data Centralization

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1 INTRODUCTION

The Data Editing Research Project (see Bethlehem, 1997) came to the conclusion that survey processing should follow the principles of the Business Process Redesign (BPR, see Hammer & Champy, 1993), hence it needs an organization which aims at satisfying one or more of the following conditions:

Concentration: All data processing activities with respect to a survey should be concentrated as much as possible in one department.

Standardization of hardware: All data processing activities should be carried out as much as possible on the same type of computer platform.

Standardization of software: All data processing activities should be carried out with standard software instead of tailor-made software.

Integration: All software required for data processing must be part of an integrated system using machine readable metadata information containing all required information about the survey. This metadata definition must be used by all systems and departments as the main source of information about the survey.

The idea of data centralization and data management in the present project (The EU-concerted action "Gender, Culture and Alcohol Problems") comes close to fulfilling these criteria. Though surveys were conducted in each country, at least beginning with the creation of a pooled databank, the above-mentioned criteria were largely applied. Data were processed in one department, using the same computer platform and standard software for processing the data. Also, a common set of metadata definitions was developed. Metadata are "data about data" (van der Berg, de Feber & de Graaf, 1992) and contain information required for collecting, processing and publishing survey data. We follow Bethlehem (1997) that this should contain:

- a) *Definitions of survey variables:* Each variable must have an identifying name with a domain of valid values.

- b) *Data model*: This describes the relationships between variables in terms of groups, e.g. multiple response formats or item batteries for scales, but also nested variable sets (e.g. sets of variables for drinkers only).
- c) *Route instructions*: Route instructions define the order in which and the conditions under which questions were asked (e.g. skips).
- d) *Relationships*: Whenever relationships impose restrictions on the values of a variable (e.g., drinking of spouses was only available for individuals living in a steady partnership) these restrictions must be specified to carry out inconsistency checks.
- e) *Computations*: Often survey variables are not the direct response to a question, but are derived as a new variable by means of arithmetic expressions (e.g. construction of volume of drinking from drinking frequencies and quantities).
- f) *Links to other files*: Originally this point refers to longitudinal data sets, i.e. it must be assured that panel data can be combined. In the context of the present study this relates to the merging of different country datasets or the merging of special workdecks with other workdecks (for the meaning of workdecks see below).
- g) *Other*: Relationship to variables across surveys, information about the sampling design, etc.

As outlined by Bethlehem (1997) the data model is the backbone to many problems related to complex surveys, because it is hard to keep track of the overall structure of all variables, potential skips and nested data. She recommends grouping of data and metadata in a modular way, allowing concentration on a limited group of variables at the time and to see at a glance their relevant structural relationships. This concept was used in the data centralization process by constructing different subgroups of variables, thematically related – so-called workdecks.

The data centralization of the present study was conducted in four major steps that comprised all the 7 points mentioned by Bethlehem (1997) above. The first step consisted of identifying variables that were comparable across datasets. This phase is described in more detail in the subsection “**Coding**” and ended by attributing unique variable names to the survey variables used in the study by also reflecting item batteries for scales and multiple response questions, and the creation of a codebook (see the “definition of survey variables”, “computations” and parts of the “data model” in the terminology of Bethlehem (1997)).

In the second phase, data sets were edited to reduce inconsistencies, including the follow-up of skip (or route) instructions or restrictions on values (see “data model”, “route instructions” and “relationships” in the terminology of Bethlehem (1997)). This step is described in more detail under “**Data Editing**”.

The third step consisted of creating new variables (see “computing” in the terminology of Bethlehem (1997)). The measurement of alcohol consumption requires the combining of different variables, e.g. the multiplication of annual frequencies and usual quantities to yield a volume measure. A nomenclature was developed also to construct unique variable names for these newly created variables, and thus repeated the “Coding” step for this set of variables.

Both the creation of variables and their coding is described under “**Construction of drinking indicators**”. This step concluded developing “**Recommendations for the use of drinking indicators within and across countries**” (see appendix A1).

Finally, “**Links to other files**” (Bethlehem, 1997) were provided. This included 1) the creation of workdecks across countries, and the development of a data model that allowed the linking of

workdecks. Workdecks are subgroups of variables which are thematically interrelated (e.g. variables for drinking indicators, sociodemography, or drinking consequences). 2) Additional information was collected about the different surveys and archived, mainly the collection of questionnaires in original language and their translations, and the description of the sampling design and the use of corresponding weighting variables to account for the sampling design.

2 CODING

In general, coding is understood as the process whereby raw survey data, usually responses to open-ended questions, are classified and transformed into a form that can be used for final estimation and tabulating of data. In the present project, coding is more understood as the process to provide variable names across different surveys with partly different questionnaires, which could be used by other researchers to run their analysis in a decentralized way. Thus, the task was to develop a *Nomenclature* of variable names that makes it easy for other researchers to a) find similar items across surveys, and b) to directly identify differences in items and questions which were intended to measure the same construct.

To understand the rationale behind the coding procedure it is important to know that not all countries used the GENACIS core instrument, but some countries provided survey data on alcohol consumption whereby country-specific questionnaires were used. However, many of the surveys' questions were related or comparable to questions asked in the core instrument, but these questions were not exactly the same. Deviations from the core instrument were, for example, related to different wording of the question or different response formats (see examples below).

2.1 Nomenclature for survey variable names

This section describes the coding of variable names. In principle, four major types of variables were dealt with: a) core variables that use the exact core question with same question wording and response formats, b) comparable variables but with different question wording and/or different response formats, c) variables that had to be constructed from different questions to become comparable to the core instrument, and d) additional items not related to the core instrument.

Only three of them can be found in the codebook (see current version of the codebook under www.genacis.org), the fourth type describes variables that are not related to the core questionnaire, but had some relevance as regards the association with alcohol consumption. These variables can be found on www.genacis.org and are called "additional variables". Their variable names begin all with "add" for "additional".

We will focus on the first three types. A more detailed explanation is given in appendix A2. The three major types all have a common structure. This structure consists of a variable name with 7 characters

- a) **Mandatory:** the "root" of each variable label = 4 characters (position 1-4 of variable label)
[EXAMPLE: SEDU]

- b) **Optional:** some variables consist of sub-questions or multiple response questions. For each sub-question or multiple answer category 1 additional character (a to z) is reserved for the variable label (position 5 of variable label) [EXAMPLE: NMLCA, NMLCB, etc.]
- c) **Optional:** some variables differ from the core and therefore received a country-specific code (position 6 and 7 of the variable label) [EXAMPLE: SEDU_15]

The root: The root consisting of four letters was given to each question in the core questionnaire. It includes two different parts:

1. The first character signifies the variable group (for example: S for sociodemographic variables):

S	Sociodemographic
W	Work experiences
N	Social networks
D	Drinking variables
F	Familial and other drinking contexts
C	Drinking consequences
I	Intimate relations
V	Violence
H	Health and lifestyle

2. The other three characters signify the unique part of the label of each variable in the corresponding group (for example: edu for education).

Each question in the core questionnaire is labeled accordingly, and the label can be found in the right upper corner of the question boxes for the core instrument (appendix A3).

For example:

Question 3 of the expanded core questionnaire asks about the formal education of respondents and is part of the variable group: (Socio) Demographics – first letter of the variable code: **S**. The variable's specific code (three letters) is **EDU**, and thus the root for variable name (corresponding to the variable name of a core instrument question is **SEDU**. In the codebook the variable would be described as follows, with the variable name in the right upper corner:

3.	What is the highest grade or year of school you have completed?	SEDU
	No formal schooling	1
	8th grade or less	2
	Some high school	3
	High school diploma or G.E.D	4
	Some college or 2 year degree	5
	Bachelor's degree	6
	Graduate or professional school	7

2.2 Sub-questions or multiple response questions

Some variables represent a sub-question or multiple response questions, for example, the question 28 of the expanded core questionnaire reads:

28. How many times during the last 30 days have you had informal and supportive contacts with the following persons, including letters, phone calls, or e-mails?	NLMC				
	Daily or almost every day	Several times a week	Once or twice a week	One to three times in the last 30 days	Not at all during the last 30 days
a. Your spouse/ partner/romantic (non-cohabiting) partner	5	4	3	2	1
b. Your child/children	5	4	3	2	1
c. Other female members of the family	5	4	3	2	1
d. Other male members of the family	5	4	3	2	1
e. Someone at work	5	4	3	2	1
f. Female friend(s) or acquaintance(s)	5	4	3	2	1
g. Male friend(s) or acquaintance(s)	5	4	3	2	1
h. A doctor or a health worker	5	4	3	2	1
i. Others	5	4	3	2	1

There are 9 different sub-question (a to i) which have all the same character to signify the variable group (N = Social Networks) and the same three characters to specify the variable in question 28 (LMC for letter, mails, calls). To enable the reader to discriminate the 9 different sub-questions a 5th letter has to be used.

This letter is numbered accordingly to the sub-questions a to i in the core instrument. The variable name for sub-question a (Your spouse/ partner/ romantic (non-cohabiting) partner) is then NLMCA, sub question b is named NLMCB and so on. The same applies to multiple response questions (see appendix A2).

For all variables that were asked in the same way as the core (with same wording and response formats) the variable name uses 5 characters only.

For most variables, however, not all countries used the core instrument. A typical example is education. Almost no country collects data on education in the same way, also related to different educational systems. Most countries, however, had a comparable question. To mark in the variable name already that there are differences to the core, a country identifier was added as 6th and 7th character of the variable name. For example the core question reads:

3. What is the highest grade or year of school you have completed?	SEDU
No formal schooling	1
8th grade or less	2
Some high school	3
High school diploma or G.E.D	4
Some college or 2 year degree	5
Bachelor's degree	6
Graduate or professional school	7

In e.g. Hungary, however, a slightly different version was used:

- What is the highest grade of school you have completed?

less than 8 th grade	1
8 th grade	2
worker training school	3
secondary school final examination	4
bachelor's degree	5
master's degree	6
no response	99

Decision for the codebook: In Hungary the question is almost the same, although answer categories are different, but in general the question is comparable. The Hungarian question was assigned the same root of the core (i.e. SEDU). The underline character (_) is the "wild card" for sub-questions or multiple response questions, which was not needed for the question on education. The variable label required, however, a country code (here 15 for Hungary), because the variable does not perfectly match the core questionnaire. Therefore the Hungarian variable on education was labeled SEDU_15.

Each country has a unique country code. These codes can be found in the Codebook and are as follows:

PARTICIPATING COUNTRIES:	COUNTRY CODE
Switzerland	01
Germany	02
Italy	03
France	04
UK	06
Israel	07
Mexico	08
Sweden	09
Finland	10
Norway	11
The Netherlands	12
Austria	13
Czech Republic	14
Hungary	15
Brazil	17

Remarks Only countries of the EU-study listed; country codes are therefore not consecutively numbered because of countries being part of the wider GENACIS study but not listed here

Of course, for item batteries with sub-questions or for multiple response questions the 5th position has not an underline character as in the Hungarian example of education, but letters A; B; C; etc.

To give an example, the core questionnaire (question 42; see appendix A3) asks about harmful effects in 7 different areas (sub-questions a to g). The variable names of the core questions would be CHEFA-CHEFF. The core questions reads as follows:

42. During the last 12 months, has YOUR drinking had a harmful effect		CHEF
a. on your work, studies or employment opportunities?	NO	1
	YES; ONCE OR TWICE	2
	YES, THREE OR MORE TIMES	3
b. on your housework or chores around the house?	NO	1
	YES; ONCE OR TWICE	2
	YES, THREE OR MORE TIMES	3
c. on your marriage/intimate relationships?	NO	1
	YES; ONCE OR TWICE	2
	YES, THREE OR MORE TIMES	3
d. on your relationships with other family members, including your children?	NO	1
	YES; ONCE OR TWICE	2
	YES, THREE OR MORE TIMES	3
e. on your friendships or social life?	NO	1
	YES; ONCE OR TWICE	2
	YES, THREE OR MORE TIMES	3
f. on your physical health?	NO	1
	YES; ONCE OR TWICE	2
	YES, THREE OR MORE TIMES	3
g. on your finances?	NO	1
	YES; ONCE OR TWICE	2
	YES, THREE OR MORE TIMES	3

In the Finnish questionnaire, for example, no corresponding items could be identified for the first 5 core questions (CHEFA-CHEFE), but there were two questions on physical health and financial problems asked as follows:

- Have you, during the last 12 months, had health troubles which you believe to have been caused by your use of alcohol?

yes	1
no	2

- How often during the last 12 months has it occurred that due to your drinking you have had trouble with your finances?

never	1
1-2 times	2
3 times or more	3

Thus, the Finnish data set had two questions on harmful effects that asked questions on consequences related to the core, but with slightly different wording or different response formats. Therefore, the first question described above received additionally to the root name CHEFF a country specific numeric code (09 for Finland: CHEFF09) to signify the differences compared to the GENACIS core questionnaire. The same was done to the second variable.

In some cases, even new variables had to be constructed by means of other variables. For this third type of variables the same labeling system of 7 characters was used. The additional questions used to

construct this variable are shown in the country specific appendices (fourth type of questions, for an explanation see appendix A2).

To give an example, the core question CINJ (question 45 of the GENACIS core; C for part of the Consequences section and INJ as specific code for the question about INJuries) asked "Have you or someone else been injured as a result of your drinking" with response formats "Yes, during the last year", "Yes, but not in the last year", and "Never". The US National 9 survey has two sets of questions that permitted the construction of a similar variable. The first set asked for answers on two statements:

- a) "My drinking contributed to getting involved in an accident in which someone was hurt or property, such as a car, was damaged", and
- b) "My drinking contributed to getting hurt in an accident in a car or elsewhere".

For both questions an additional probe asked "Was that during the past 12 months"?

A second set of items asked "In the last 12 month did you have an injury for which you thought about getting treatment, whether or not you actually did get treatment", with the probe "in the 6 hours before the most recent injury, did you drink any alcoholic beverages – even one drink?

Decision for the codebook: It was decided to base a comparable measure on the first set of items, because the second was too restrictive as regards a) only the most recent injury, and b) the association with potential treatment. For the first set all four variables (two questions and the two past 12 months probes) were combined into a single variable with the same answer categories as for the core. Both questions were used because the first referred to someone else being hurt, and the second to the drinker being hurt.

Comparable to the Finnish example above, the variable name in the US case was constructed that describes a) the relation to the core instrument (C for part of the consequences section and INJ as specific code for the question about injuries) and b) its deviation from the core instrument (by adding a unique country code (26 for USA). Thus, the variable label became CINJ_26. The corresponding response codes were shown in the codebook, and the original variables to construct this single variable are shown in the country-specific appendix.

With the US an example of a country outside the EU-project (but inside the wider GENACIS project) was used, because examples from EU-countries for this type of variables were too complicated to be described here (but see codebook and country appendices at www.genacis.org). For example, in Switzerland, 8 questions were used to measure the current educational status, and an indicator comparable to the core was constructed by means of these 8 questions.

2.3 Identification of survey variables

The identification of variables and the coding of variable names were performed in four steps, first research assistants of the data centralization team were assigned to questionnaires of countries and followed the coding rules (see appendix A2 for a description of the coding system for variables, and appendix A3 for the corresponding codebook for the core instrument). In a second step the leader of data centralization independently controlled the coding rules and the questionnaires for each country to avoid differences in understanding of rules between research assistants. Thus, the process of selection of variables started from the questions in the core instrument and attempted to identify corresponding variables in the country-specific datasets. However, whenever variables were identified that were relevant to the study of alcohol consumption and harm (e.g. "have you discussed your

alcohol problems with a religious leader"), but were not part of the core instrument, these variables were also captured and archived in a country-specific appendix.

In a third step an administrative project assistant created the corresponding codebooks and the country-specific appendices. This can be seen as a second control check, because the same administrative project assistant performed the creation of all codebooks for all countries and thus very quickly became familiar with the concepts and differences in wording of items. As the fourth step, all country-specific codebooks were combined into a project codebook and country-specific appendices were stored into a joint document (see www.genacis.org). This codebook again follows the core instrument. For each core question the original question with corresponding variable name and coding of corresponding response formats were listed. This final step, however, was done after the data were edited accordingly.

3 DATA EDITING

Following the Federal Committee on Statistical Methodology (1990) we understand editing as "*Procedures designed and used for detecting erroneous and/or questionable survey data (survey response data or identification type data) with the goal of correcting (manually and/or via electronic means) as much erroneous data (not necessarily all of the questioned data) as possible, usually prior to data imputation and summary procedures*" (Quoted from Lyberg & Kasprzyk, 1997, p. 355).

Data editing aimed at ensuring validity and consistency of individual data records, guaranteeing consistent cross-tabulations at all levels of detail, is referred to as **micro-editing**. By contrast, approaches which ensure the reasonableness of data aggregates are called macro-editing or aggregate editing (Granquist & Kovar, 1997). **Macro-editing**, i.e. editing of aggregated data of suspicious subsets (e.g., related to regions or interviewers) commonly requires sophisticated background knowledge of the situation in the corresponding countries or the data collection processes, and was thus not part of the work of the data centralization group. However, aggregates of edited data were sent to the survey leaders for a validity control in these countries.

Commonly, a first step of micro-editing is a clerk's review of a sample of questionnaires to check the quality of the data to provide feedback on omissions, errors or misunderstood instructions. At the second step, a review of selected key items for legibility and consistency on all questionnaires has to be undertaken (Lyberg & Kasprzyk, 1997). These two first phases should also include reconciliation procedures involving respondent contacts to decide about whether data should be corrected or not. Those procedures were not part of the data centralization process and had to be done by the survey leaders in the respective countries. The data editing procedures described here were related to datasets that were pre-processed by the survey leaders and used computer based checks to identify suspicious and inconsistent data and invalid or missing entries, and thus was predominantly located at the third step of the micro-editing approach described by Lyberg & Kasprzyk (1997).

Editing always creates the risk of "overediting", e.g. distorting true data by fitting them to models of "clean data". This can happen with editing of inconsistent data.

For example, assume the situation that alcohol-related consequences were asked to current drinkers only. Now, first the variable to define whether someone was a current drinker, a former drinker, or a lifetime abstainer was edited, and later on, as the second step, the variables of consequences of current drinkers, whereby lifetime abstainers or former drinkers should have missing values. Setting

values on consequences of non-current drinkers to missing may be a “correct” edit, e.g. if former drinkers answered the question because they did not understand the skip instruction to mean current drinkers only, but an over edit if a current drinker was falsely edited to be a former drinker during the first step.

To avoid overediting, related data (e.g. drinking indicators and alcohol-related consequences) were cross-checked before edits were undertaken.

In addition, many final survey estimates would not have been different had the editing process been curtailed. Granquist and Kovar (1997) therefore suggest to concentrate resources on areas with high impact is a workable solution. This approach was followed by putting most effort into the data editing of alcohol consumption variables and consequences. Other variables, e.g. drinking contexts were then evaluated with respect to the consumption variables. Remaining inconsistent cases were commonly left unedited.

3.1 Skip instruction checks

In a first step, tests for skip instructions were done to identify whether missing values were really missing or related to skips, e.g. never drinkers should have missing values for all questions related to current alcohol consumption. Missing values were replaced by unique codes such as 9 or 99 (or 0 for e.g. drinking frequency) to facility completeness checks. For cases with missing values on e.g. drinking variables were left missing if the variable to identify skips was also missing.

3.2 Completeness checks

A first run of editing tested for completeness of responses. A first definition of drinking status and skip instructions was applied first to distinguish between “good” missings (e.g. to abstainers not getting question on alcohol consumption) and “real” missings (e.g., variables for which valid answers should exist). Across all variables the number of missing responses was calculated, and cases with missing values on 50% of the valid questions were deleted from the data set. Only few countries and less than 1% of the sample size within each country were affected by this step.

3.3 Range of variables checks

All variables were run for range checks which commonly meant a frequency tabulation of values to see whether all codes in the data file for a variable have also a counterpart in the questionnaire provided by each country. Out of range codes were discussed with the corresponding survey leaders. Common findings across many countries were

- a) *Additional codes not mentioned in the questionnaire or in the corresponding country codebook related to coding of unanswered questions (e.g. codes for “don’t know”, “missing”, “active refusal”):* Those were often related to country-specific coding of skips (e.g. inapplicable because of a skip), coding of a “don’t know” category, not mentioned in the questionnaire, or differential coding of “missings” (e.g. unspecified missings and a particular code for active refusals of a particular, often sensitive question).

- b) *Additional codes not related to unanswered questions:* These codes were either real coding errors, or codings that deviated from the questionnaire or the provided codebook. An example would be the coding of 1 to 5 instead of an indicated coding from 0 to 4 in the questionnaire, resulting in an additional code of 5 (and a missing code of 0).
- c) *Lack of response categories that should be in the dataset:* Those were mostly related to receiving wrong or incomplete information from survey leaders. For example, one country sent data which came from another study, another country had already merged categories with only few responses into fewer categories (resulting in lack of codes of the original variable for categories which were combined). More often, however, countries did not send their final questionnaire version but either an intermediate version or simply the core questionnaire without mentioning those items or variables that had actually been rephrased with other answer categories.

Out-of range corrections were only done if there was sufficient information in correspondence with the survey leaders how this had to be changed (e.g., changing codes from 0 to 4 into 1 to 5). Otherwise (e.g. a code of 8 when there should be only codes between 1 and 6) were changed to missing values, if no further specification from survey leaders could be obtained how these codes should be changed.

3.4 Consistency checks

This was the most labor intensive part of the data centralization process. Consistency checks involved mainly variables related to alcohol consumption, which will be described in more detail below, but also involved other variables, e.g. cross-checking whether variables related to partners/spouses were answered only by respondents who indicated having such a personal relationship.

The most important part, however, was the editing of alcohol consumption variables. The first step was to identify drinkers and abstainers and, among the latter, former drinkers and lifetime abstainers, if possible. Inconsistencies occurred e.g. when individuals indicated to be current drinkers, but had no values on alcohol consumption or related consequences, or indicated alcohol consumption or alcohol related consequences, but not to be drinkers.

The basic principle to change values was that at least two independent sources of information (in addition to drinking status) should consistently point to the most likely “true” drinking status. Most surveys had different sets of variables usable to cross-validate drinking status, e.g. drinking frequencies for different recall periods (e.g. 12 months and 30 days), or questions on both alcohol consumption and related consequences. No hard, universal rules could be applied for this data editing process, but some examples may describe the process of decision making (Table 1).

In these examples, a set of potential questions for cross-validation was used, whereby not all, but at least three questions (or blocks of related questions, e.g. frequency and quantity of drinking to measure alcohol consumption) were asked in the survey: A question on current drinking (e.g., Have you consumed alcohol during the past 12 months?), a question on former drinking (e.g., Have you ever consumed alcohol in your life?), questions on alcohol consumption (frequency, quantity) in a) past 12 months and b) past 30 days, questions on alcohol related consequences (intended to current drinkers only).

It should be noted that the examples relate to datasets where inconsistencies occurred and thus skip instructions were not correctly followed by the respondents (postal), the interviewer (face-to-face), or

no CATI system (telephone interviewing) was used, wrongly applied or could not be applied because the skip question was not answered.

In a second step, inconsistencies were corrected as regards the remaining drinking variables, whereby the edited drinking status was used as the main indicator. In the aforementioned examples, only the consumption values (12 month consumption) of the fourth example would have been changed to zero consumption. However, compared with edited datasets, in any analysis stratified by drinking status (e.g. mean volume among drinkers) calculations based on unedited consumption values would not have resulted in different estimates among drinkers (because they occurred among abstainers) and would have led to positive values - and thus inconsistent values - of alcohol consumption among abstainers.

Further data editing, including missing value imputation, was conducted for the drinking variables. This is described in more detail below (see "**Construction of drinking indicators**").

Table 1. Examples for consistency checks and decisions for changing variable values

Example	Current drinking status (CDS)	Former drinking	Alcohol consumption (30 days)	Alcohol consumption (12 months)	Conseq.	Decision to change (CDS)	Rationale
1	drinker	MV	-	yes	MV	unchanged	No inconsistencies with drinking, but missing consequences
2	abstainer	MV	MV	MV	yes	unchanged	Inconsistency with consequences, but not with drinking, missing data on former drinking, respondent might have attributed consequences to former drinking
3	drinker	-	no	no	no	changed	Coding error for current drinker, might have been a former drinker
4	abstainer	yes	no	yes	no	unchanged	Inconsistencies for 12 month drinking, but not for consumption in past 30 days. Respondent may have stopped consumption past year or misunderstood the reference period; high likelihood of being a non-problematic ex-drinker.
5	MV	yes	-	yes	yes	changed to drinker	No inconsistencies; former drinking question asked because of no skip possible, and thus response is indicative for consuming alcohol
6	abstainer	yes	yes	yes	no	changed to drinker	Inconsistencies with drinking and consequences; but respondent answers all questions on drinking and consequences; high likelihood of miscoding of drinking status
7	drinker	MV	no	no	MV	changed	Inconsistencies, but consistent no alcohol consumption, and no responses to consequences; high likelihood of miscoded drinking status
8	MV	MV	-	no	MV	changed to abstainer	No consumption, and missings on all other variables; high likelihood of being abstainer

- : question not in survey

MV: missing value

no/yes: questions were asked and clear answers as regards either consumption or consequences could be obtained

3.5 Data capture

Data capture is commonly understood as the process in which information recorded from the questionnaire is converted to a format that can be interpreted by the computer. In the present study, surveys were transmitted to data centralization already in a computerized format, and therefore this part of data capture was completed by survey leaders. After identification of variables and coding of names, data capture in the present study meant the assigning of the same numerical values to the same categories. To give a simple example, sex often has codes such as 0 and 1 but also 1 and 2. We therefore recoded all surveys in a way that being female was consistently coded 2 for females and 1 for males. Other examples were the attribution of a consistent value across surveys to missing answers, or the coding of questions like those of the AUDIT. The AUDIT consists of 10 items, which have scores that should range from 0 to 4 to construct a summary scale across the ten AUDIT items ranging from 0 to 40 (Babor *et al.*, 1989) (, 1989). In some countries the ranges for the single items were, however, from e.g. 1 to 5 not in line with the range needed to construct an AUDIT summary score. Such a recoding was only done for items which were directly comparable (see appendix A2 for the meaning of directly comparable) across all surveys, and thus usually involved standardized instruments such as the AUDIT.

The basic principle for data capture was, however, to leave codes for variable categories in their original form, e.g. as delivered by the survey leaders, and to describe the corresponding codes in the codebook (see current version of the codebook under www.genacis.org). This was done to leave the opportunity for other researchers to classify categories according to their analysis needs, e.g. to regroup categories, to merge categories into a single category, or to create extra categories across countries for which the researcher decided that the wording of categories was too vague in one country to be sufficiently matching with similar codes in other countries (see Lyberg & Kasprzyk, 1997).

3.6 Construction of drinking indicators

The construction of drinking indicators followed the **general** rules of coding and data editing. However, it deserved some particular rules and particular data handling, and is thus described here in an extra section.

It is widely accepted that measurement of alcohol consumption needs the consideration of the particular drinking behaviors in each country (Bloomfield *et al.*, 2003, Knibbe & Bloomfield, 2001). Therefore, measurement instruments must and should vary across countries. Thus, in the present study rarely did two countries use exactly the same, unique instrument. But even if similar instruments were used, they deviated in several respects across countries. The following aspects had to be taken into account:

- different general instruments, e.g. Graduated-Frequency (GF) versus Quantity-Frequency (QF) instruments;
- generic (all beverages combined) versus beverage-specific measurements;
- different drink sizes and/or “standard drinks”;

- different recall periods, e.g. consumption “yesterday”, “in the past 7 days”, “in the past 30 days”, or “in the past 12-months”;
- single measurement instruments versus multiple measurements with different instruments, e.g. past 30 days and past 12 months measurement, or measurement with GF and QF;
- different response formats for single items, e.g. open versus closed answer categories for drinking quantities, or different categories for drinking frequencies.

As a consequence, it was no longer desirable to only identify variables “comparable” to the core questionnaire, but to provide researchers with all available instruments that measure alcohol consumption. This was done also to leave the door open for researchers to choose the indicators most suitable for their corresponding research question. The following indicators were constructed:

- drinking status (drinker, former drinker, abstainer)
- Overall frequency of drinking
- Beverage-specific frequencies and quantities
- Volumes of drinking
- Usual quantity of drinking
- Frequency of risky single occasion drinking (RSOD, also called heavy episodic or binge drinking)

3.7 Some general rules

First, one of the major rules was to keep the creation of indicators consistent within each instrument. This meant, for example, that if both frequencies and quantities were measured with different recall periods, e.g. past 30 days and past 12 months, also the corresponding volume measures were constructed as one volume based on past 30 month questions only, and a second volume measure based on questions related to the past 12 months recall. Similarly, GF-type measures were not mixed with QF-type measures. Hence, if different alcohol consumption measurement instruments were available, newly created indicators (e.g. volume based on quantity and frequency questions) were not constructed by mixing questions across different instruments but separate indicators were constructed, whenever possible. To give a counterexample, in France quantities of alcohol consumption were based on the consumption “yesterday” and “last Saturday” but frequencies of drinking were asked with a 12-month recall period, and thus, to yield an estimate of annual volume questions from different instruments had to be combined. For all countries, however, a so called “optimal measure” was constructed additionally to the separate measures, e.g. by replacing missing values on one measure with those of the other. This is described in more detail under the subsection “data editing and coding of alcohol consumption measures”.

Second, it was attempted to make instruments as comparable as possible across countries, by applying the same rules for the coding of drinking status, drinking frequencies, drinking quantities and volumes across different country-specific measurement instruments. For each country the construction of drinking indicators was documented (see appendix A4).

Drinking status: Where possible, abstention was defined as abstention in the past 12 months, and in addition abstainers were differentiated between former drinkers and lifetime abstainers. In a few countries (e.g. Austria), abstention referred to a shorter period (past 3 months) or no distinction between former drinkers and abstainers was possible (e.g. Israel or Austria).

Frequencies of drinking: Because of differences in recall periods, a simple code of e.g. "4 times" had different meanings whether asked in a 7 day measure or a 12 month measure. Thus, as a data harmonization step all frequency measures were projected to "annual frequencies of drinking days". Therefore, frequencies with a notation of "weekly" were multiplied by 52, and with a notation of "monthly" were multiplied by 12.

When categories used a wider range (e.g. once to three times a month) midpoints were used. The category "every day or nearly every day" was set to 6 times a week. If "every day (or daily, etc.)" was a separate category this was set to 365 days a year. Particular treatment was necessary for "not directly quantifiable" categories such as "less often", "several times per week", etc. In such a case, the midpoint between adjacent categories was used. To give an example, in Switzerland, "several times a week" was a category between "once a day" and "once or twice a week". Thus, this category covered the range of three to six times a week with a midpoint of 4.5 times a week. Similarly, the category "less than once a week" was a category between "once a week" and "never" and thus the midpoint between 3 times a month (=36 times a year) and "once a year" was used. Table 2 gives an example of conversion into annual frequencies.

Table 2. Example of response alternatives for drinking frequencies and conversion into numeric values of annual frequencies

Core	Annual frequencies of drinking days	Switzerland	Annual frequencies of drinking days
Every day or nearly every day	$6*52 = 312$	Three times a day	365
Three or four times a week	$3.5*52 = 182$	Twice a day	365
Once or twice a week	$1.5*52 = 78$	Once a day	365
Once to three times a month	$2*12 = 24$	Several times a week	$4.5*52 = 234$
Seven to eleven times past 12 month	9	Once or twice a week	$1.5*52 = 78$
Three to six times past 12 month	4.5	Less than once a week	18.5
Twice past 12 month	2		
Once past 12 month	1		
never past 12 months (additional question distinguishing lifetime abstention and ex-drinking)	0	Abstainer past 12 months (additional question distinguishing lifetime abstention and ex-drinking)	0

Quantities of drinking: Differences in measurements of quantities were related to whether the concept of "standard drinks" (e.g. for generic measures where each "drink" is assumed to contain the same amount of pure ethanol) was used or quantities were asked for differing, beverage-specific drink sizes (e.g., a pint of beer, a glass of wine, or directly given in liters e.g. half a liter of cider). To harmonize these different measures, quantities were converted into grams of pure ethanol. In the case of standard drinks, survey leaders were asked to provide the corresponding grams of pure ethanol for a standard drink (commonly 10 or 12 grams). As regards beverage-specific measures survey leaders had to provide a) the drink sizes for different beverages and b) the ethanol content of beverages. To give an example, in Hungary the volume % of ethanol was assumed to correspond to 11.5% for wine,

5% for beer and 40% for spirits. A “drink” of wine was 100ml, 500ml for beer and 50ml for spirits. Thus, with one ml of pure ethanol being 0.793 grams of pure ethanol, a drink of beer contained $0.05*500*0.793=19.83$ grams of pure ethanol.

The number of drinks was either asked in an open-ended format or with closed-ended categories. For the latter, the highest quantity category was commonly open to the higher side, e.g. 5 bottles of beer **or more**. To take the “or more” into account, the following algorithm was developed. An additional amount was added to the highest defined amount (in the example 5 bottles of beer). This was defined as the half amount of the difference between the highest defined amount and the midpoint of the adjacent category. To give an example for 5 bottles of beer: if the adjacent category was 3-4 bottles then for the upper category 0.75 bottles were added ($0.5*(5-3.5) = 0.75$) resulting in 5.75 bottles for the upper category.

Volume of drinking: Volumes of drinking were calculated as the total volume consumed in grams of pure ethanol in the past 12 months and hence projected to an annual volume if based on a shorter recall measure (e.g. a measure based on past 30 days). In the generic QF approach this corresponded to the multiplication of the usual frequency with the usual quantity measured in standard drinks. In beverage-specific approaches, beverage-specific frequencies were multiplied with corresponding quantities and summed across beverages. In some countries, however, quantities were asked for occasions and not for drinking days (see e.g. the example of Switzerland above with twice a day resulting in 730 occasions). For these countries number of occasions and not the number of drinking days were multiplicatively combined with corresponding quantities.

A particular case is volume measures derived from the GF approach. The GF is a self-report method of measuring alcohol consumption that uses a series of questions to probe the frequency of consuming different levels of quantities (Greenfield, 2000). It starts with assessing the maximum quantity consumed (i.e., maximum number of drinks per day) in a given reference period, usually the past 12 months. The follow-up questions ask the number of days on which different mutually exclusive amounts of alcohol have been consumed, beginning with the highest quantity category followed by lower categories (e.g. the number of days in the past year with at least 12 drinks, at least 8 but less than 12 drinks, at least 5 but less than 8, at least 3 but less than 5, at least 1 but less than 3 were consumed). Frequencies were multiplied with the corresponding quantities and summed across all quantity levels. Sometimes, however, the frequencies for the different, though mutually exclusive quantities, summed to more than 365 drinking days, e.g. because of “poor math” of the respondents. For those cases, frequencies were reduced by a constant factor in such a way that their sum was exactly 365. To give an example, if the sum of frequencies across different quantity levels was 400, all frequencies were scaled down by the factor 365/400.

Usual quantities: Usual quantities theoretically should indicate the amount of alcohol consumed on days when drinking has occurred. In a generic QF measure this corresponds to the quantity question. For beverage-specific QF and GF approaches, however, there is no direct measure of usual quantities; hence they were derived indirectly by dividing the annual volume by the number of drinking days. For the beverage-specific QF, the maximum frequency of a generic frequency question and the beverage-specific frequencies were used (in some countries without the generic frequency question, only the maximum of beverage-specific questions was used). This was necessary because a) the highest beverage-specific frequency may not reflect the overall frequency of drinking, since individuals, for example, may drink only beer some days, while only wine on other days. The sum of

beverage-specific frequencies would however overestimate the overall drinking frequency for individuals who drink more than one type of beverage on the same day, and b), the generic frequency alone was not used because in some countries certain individuals reported a higher beverage-specific frequency (e.g. for wine) than a generic frequency (= frequency for all beverages combined), for example, because they may forget their glass of wine with meals with a generic question, or do not consider some alcoholic beverages as being alcohol (e.g., low volume beers).

For the GF, frequencies were summed across graduated quantities. As noted earlier, summing drinking frequencies across different quantity levels may result in more than 365 drinking days a year for the GF measure. There is no clear suggestion in the literature how to deal with this obvious over reporting. In the present study, for drinkers with annual frequencies above 365 drinking days all frequencies at different quantity levels were "adjusted" by the same factor.

Appendix A1 details, which variables of volumes and frequencies should be used to derive an estimate of a "usual quantity on days when drinking" for each country.

Frequency of risky single occasion drinking. Questions to create this variable were based on either a single item asking for the frequency of drinking a certain amount (e.g. 5 or more drinks, 8 or more drinks, etc.), or, in the GF approach, on the adjusted sum of frequencies for quantity levels exceeding 4 drinks.

3.8 Data editing and coding of alcohol consumption measures

Data editing: Alcohol consumption measures were edited for those individuals identified as current drinkers. Editing of alcohol consumption measures is of particular importance because several variables (e.g. beverage-specific frequencies and quantities) have to be combined to construct more complex indicators, as e.g. annual volume based on beverage-specific questions. Standard statistical software, however, renders summary measures as missing if only one of the components is missing. This can lead to high percentage of overall missing values (see e.g. Gmel, 2001). In most cases the loss of respondents as missings due to missing values on one of the components is counterproductive and unnecessary. To give a hypothetical example of a consumer who usually drinks beer and wine and provides all the necessary information (quantities, frequencies) for these beverages. Sometimes, however, this consumer also has a sip of cider, but was unable to indicate the "usual amount" of cider as an annual average. These rare sips over the year would have only marginally changed the overall volume of ethanol intake of this respondent, but as a result of combining measures across beverages in standard software calculations the consumption of this individual would have been missing because of a missing value for cider consumption. As shown by Gmel (2001) respondents usually have more difficulties in indicating a usual quantity than the corresponding frequency. In addition, differences in volumes are commonly more strongly related to drinking frequencies than to quantities (Gmel & Rehm, in press). Frequencies also are more variable than quantities in a sample. Thus, more errors can occur by imputing a frequency than a quantity. In addition, a missing value can simply mean that the corresponding beverage was not consumed, e.g. a frequency of 0 and a missing value on the corresponding quantity.

To avoid unnecessary missing values the following strategy was adopted.

- Missing values were imputed only for quantities, and only when the corresponding frequencies were indicated. The imputed value was the median quantity of valid values of respondents with the same drinking frequency. Commonly this was the lowest possible quantity that respondents could indicate. To give an example, a respondent indicates drinking 78 days a year beer, but did not respond to the quantity question for beer. In this case the median quantity of all beer drinkers with 78 beer drinking days **and** valid answers on the quantity question for beer was imputed.
- For missing frequencies the corresponding quantities were set to missing. This has no effect on volume measures because the product of frequency and quantity would also be missing, even with a valid quantity.
- For frequencies being 0 the corresponding quantity was also set to 0. This would again not change the volume, because the product of any value with 0 would similarly be 0. The rationale behind this is that alcohol consumers may not have consumed the beverage in the respective recall period, e.g. past 30 days, but indicate the usual amount when drinking it (e.g. in the past 12 months).
- For the summation of beverage-specific volumes only beverages were added that had valid values after editing on both quantity and frequencies. Thus, the volumes of valid beverages were used to calculate an overall volume instead of rendering the whole case missing because of missings on a single beverage.

In general, this imputation strategy changed only marginally sample means or prevalences, but increased the sample size valid for cross tabulations. In addition to the “pure” measures, i.e. respecting the reference period (e.g. 30 days or 12 months), a so-called mixture measure was developed. After data editing within variables with the same recall period, missing values for e.g. volume were imputed across instruments as follows. The shortest recall period (7 days) was used as a starting point, missing values of this recall period were imputed with the next shortest period (commonly 30 days), and so on until the longest period (12 months) was reached. The rationale behind this is that shorter recall periods usually yield more accurate measures of alcohol consumption, because of fewer memory deficits of respondents, or less response burden, because respondents do not have to average changing consumption patterns over a long period such as a year. The disadvantage of short recall periods is that infrequent drinkers are misclassified as abstainers and that time frame for alcohol consumption does not match the time frame commonly used for the occurrence of consequences (commonly 12 months). Hence this approach was seen as a compromise between accuracy of alcohol measurement, reduction of missing values and matching of the time frames of exposure and outcome (Gmel & Rehm, *in press*). It is important to note that if “pure” measures existed, both the mixture and the pure measure were made available. In some countries, however, only mixture measures existed, i.e. measures that had to use frequencies and quantities with different recall periods. Some countries also used measures where volume of drinking was based on the past 7 days for those drinkers who had consumed alcohol in the past 7 days, but on consumption in the past 12 months for those who drink alcohol but had no alcohol consumption in the past 7 days. The latter can similarly be seen as mixed measures, because the reference period changes between different respondents.

Coding: Because of the differences in measurement instruments, a special coding system for the variable names of drinking indicators was developed. This coding of variable labels reflected a) the alcohol measure (frequency, quantity, volume, drinking status, RSOD), the underlying measurement

instrument (e.g., GF versus QF); the recall period (yesterday, past 7 day, past 30 days, etc.) and whether the measures were derived from GENACIS core questions or country-specific questionnaires by adding the country code. This coding system is described in more detail in appendix A5.

3.9 Links to other files: workdecks, archiving, and sample description

Workdecks: The organization of the project requests decentralized analysis of hypotheses, meaning that analysis of data were not done centrally in Lausanne but by different researchers all over the world. Commonly, analyses to test specific hypotheses can be performed with subsets of variables. These subsets of variables consisted of variables related to thematic topics, e.g. violence, alcohol-related consequences or health and lifestyle. The use of subsets of variables instead of the full dataset has several advantages:

- They are easier to exchange electronically because of smaller file sizes.
- Researchers do not have to examine the full data models for each country, but can concentrate on the data model related to their corresponding workdeck (Bethlehem, 1997).
- Data models only have to be developed for interrelated variables in these subsets.
- Errors in the data or the data model are easier to identify and to correct in smaller subsets of variables compared to the total set of all variables across all countries, which improves the overall data quality.

Therefore, subsets of variables oriented to the different subsections of the questionnaire were constructed. These subsets are called workdecks. The following workdecks were created:

Workdeck 1: Sociodemographics (e.g., age sex, education, income)

Workdeck 2: Drinking indicators (e.g., drinking status, frequencies, quantities, volumes)

Workdeck 3: Drinking consequences (e.g., consequences at work, health consequences)

Workdeck 4: Violence (e.g., partner violence, sexual abuse, alcohol use before incident).

Workdeck 5: Drinking contexts (e.g., drinking location, time of drinking, drinking motives).

Workdeck 6: Intimate relationships and sexuality (e.g., partnership satisfaction).

Workdeck 7: Health and Lifestyle (BMI, other substance use, help seeking).

In each of the workdecks additional basic variables were provided, e.g., country code, sex, age, weights (to account for sampling design) and drinking status. More importantly, however, each workdeck contained an additional variable that uniquely identifies individuals across surveys. This identification variable could be used to merge different workdecks for more refined analyses. For example, this variable could be used to merge the workdeck "drinking consequences" with that of "drinking indicators" to analyze e.g., whether consequences are related more often to a particular beverage type, RSOD or volume of drinking.

For each of the workdecks the data centralization group developed an overview table that indicates which variables were available for which country, and whether the variables were based on the GENACIS core questionnaire, or based on country-specific measurements. This was done to facilitate for researchers working with the workdecks the choice of the appropriate set of variables for their analyses. The overviews can be found in appendix 6.

Archiving: Besides databases, several other documents about each survey were collected. Survey leaders had to provide

- a) the questionnaire in both the original language, and an English translation of it;
- b) information about standard drink measures used in their country and/or common vessel sizes and alcohol contents for the different beverages asked in the study;
- c) background on the methodology of the field work in the countries, particularly the sampling design, but also information on non-response and other fieldwork related issues.

All documents were stored in the database with a particular link to the corresponding country. To collect information about fieldwork and sampling design a questionnaire was developed and sent to the survey leaders (see appendix A7).

Sampling design: Survey leaders were asked to give information about the survey fieldwork, particularly the sampling design. The following topics were addressed:

- a) Survey mode (e.g., telephone, face-to-face)
- b) Administration mode (e.g., interviewer-administered, self-administered answer sheets)
- c) Fieldwork agency (e.g., commercial pollsters, federal offices)
- d) Representativity of the sample (regional, national)
- e) Sampling frame (e.g., telephone registers)
- f) Stratification and Clustering
- g) Multi-stage and single-stage sampling
- h) Non-response and refusal conversion
- i) Weighting (pi-weights and post-stratification-weights)
- j) Length of field phase

Table 3 gives an overview about the samples used in the present study.

4 CONCLUSIONS AND RECOMMENDATIONS

Data centralization has been proven to be a major step forward for international collaborative projects. The advantages are manifold, and only four will be highlighted here. First, it creates a central contact point for all researchers in the project and thus facilitates dealing with problems with datasets. Researchers do not have to contact all survey leaders separately but can contact the data centralization office directly. This is also a very efficient procedure, because problems have to be solved only once and can then be communicated to all researchers who want to work with the database. In a decentralized project, each survey leader would probably have to answer the same question several times to the different researchers working with the data. Second, the team of the data centralization has accumulated a lot of knowledge about each of the datasets in the database, and thus can very efficiently prepare smaller datasets (workdecks) for more specific analysis. Hence, researchers who want to test specific hypothesis do not have to understand the full complexity (data model) of each of the separate complete datasets. Third, it guarantees a consistent treatment of variables. For, example the construction of drinking indicators leaves a certain elbowroom, and therefore, different researchers may use this elbowroom differently. This could lead to conflicting or even contradictory results depending on how each researcher interpreted this elbowroom. Data centralization assures that all researchers in a project work with the same definitions and the same constructed variables, and thus increases consistency of findings across different analyses. The use of consistent rules to create e.g. drinking indicators across countries also reduces measurement errors in

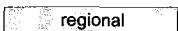
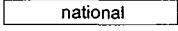
cross-country comparisons. To give a simple example, a drinking frequency of "daily or almost daily" is not operationalized by 6 times per week in one country and 7 times per week in another country, because of different interpretations of different researchers, what "daily or almost daily" measures. Fourth, the documentation of the database is facilitated, e.g. it is much easier to construct overviews of existing datasets, comparable variables across datasets, etc. than in a decentralized project, because all the information is in one hand.

There is one major disadvantage of data centralization: it is time-consuming at the beginning. This means that not all surveys can be included the same time in the database or all workdecks can be prepared at once. As a result, not all hypotheses or research questions can be analyzed and tested the same time. For example, the sequential construction of workdecks, e.g. first a drinking indicators workdeck, second a sociodemographic workdeck, third a consequence workdeck means that also the analysis has to be organized around this sequence. In the example, first only manuscripts can be prepared that relate sociodemographics with alcohol consumption and later on associations between drinking patterns and consequences can be analyzed. This implies that some researchers have to wait with their analyses until the corresponding workdeck can be created. Such delays can only be avoided with the increase of resources for data centralization, however, to the risk to increase inconsistencies between staff members of the data centralization team. In the present study, four people worked on data centralization with different tasks, which is seen as an optimum to guarantee sufficient communication between staff members to guarantee consistent treatment of datasets.

Of course, an efficient data centralization also depends on the commitment of the survey leaders within each country. There is no way out of multiple loops in communication between survey leaders and the data centralization team until a consent is reached that the data structure of datasets but also the whole process of conducting a survey in each country is fully understood by the data centralization team. One experience in the current project was that not only clear rules for data editing, coding, etc. have to be developed but also clear rules about the tasks expected to be performed at the survey site and the data centralization site. A prominent example was the collection of information about the survey sampling design. Concepts such as stratification, multi-stage sampling or response rates are sometimes not fully understood by survey leaders, and thus either information about the sampling design was not consistently collected at each survey side or survey leaders had difficulties to communicate these concepts to the data centralization team. One recommendation for future international projects therefore is to develop clearer rules for the communication between survey sites and data centralization sites in general at the beginning of collaborative project, and particularly to assure a common language for concepts of survey sampling. This may mean that responsible persons such as statisticians of field work agencies of each survey site should be included *a priori* in the collaborative project.

Table 3. Example for an overview of sampling characteristics

region	year	mode	sampling design	response rate	age range	n		n	
						men	n	men	n
Austria	1993		quota sampling stratified by age, sex, profession, region, number of inhabitants of place of residence	quota	15+	7.483	3.529	3.954	
Brazil	Botucatu 01/02)		quota sampling stratified by age and sex	quota	18+/17+	525/733	194/368	331/365	
Czech Republic	2002		170 randomly selected electoral districts in all 14 regions of the country	72.6	18-64	2.526	1.244	1.282	
Finland	2000		CAPI; based on the Finnish population register; PSU: individuals	79.41	16-70	1.932	945	987	
France	1999		CATI; based on telephone register; 2-stage; PSU: household; stratified by geographical area	71.32	12+	13.685	6.027	7.658	
Germany	2000		based on population register; 2-stage; PSU: communities; stratified by regional criterias	51.4	18-60	8.147	3.688	4.459	
Hungary	2001		based on data from the Election Office; PSU: individuals; strata: regions(rural)/districts(city)	quota	19-65	2.292	1.094	1.198	
Israel	2001		strata: community size; 4-stage (communities,geographic points, household, individual)	A	18-40	6.004	2.611	3.393	
Italy	Tuscany 01-'02		PSU: individuals; stratified by municipalities, age, and sex; 10 municipalities were chosen	61.0	18+	3.275	1.612	1.663	
Mexico	1998		3-stage (geostatistic areas or blocks, dwellings, individuals); stratified by regions	no info	18-65	5.711	2.382	3.329	
Norway	1999		3-stage (communities, households, individuals); stratified by community; individuals by last birthday	quota	15+	2.170	1.034	1.136	
Sweden	2002		based on Statistics Sweden register of total pop.; PSU: individuals	69.2	17+	5.472	2.656	2.816	
Switzerland	1997		based on telephone register; 2-stage (households, individuals); strata: cantons	68.4	15+	12.994	5.755	7.239	
The Netherlands	Limburg 1999		based on population register; strata: community	71.0	16-69	4.222	2.008	2.214	
UK	2000		CAPI; PSU: area (wards), individuals by quota sampling	quota	18+	2.001	963	1.038	

 regional	survey  face-to-face
 national	mode:  face-to-face + self-administration of sensitive variables (alcohol, drugs)
	 telephone survey
	 postal
	 mixed (telephone + postal)

PSU: primary sampling unit

A only estimate from other surveys, probably as low or even lower than 60%

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Chapter 2: Drinking patterns

Drinking and gender differences in drinking in Europe A comparison of drinking patterns in European countries

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1 INTRODUCTION

An examination of sales statistics reveals that the large differences in the level of per capita consumption of alcohol between European regions have diminished over time. If western Europe is divided into a northern tier of countries where spirits used to be the predominant alcoholic beverage, a southern tier of Mediterranean countries where wine predominates, and a tier in between of countries where beer predominates, the convergence is mostly due to an increase in consumption in traditional beer-drinking countries and former spirits-drinking countries until the 1970's, and a decrease in consumption in the traditional wine-drinking countries thereafter (Leifman 2002a, Sulkunen 1983). Also the differences in beverage preferences between the regions have diminished so that at least in relative terms the popularity of traditional beverages in each region has decreased and the share of new beverage types has increased (Leifman 2002a, Sulkunen 1983). Even though differences between regions in volume of drinking and in beverage preferences are still clear in spite of homogenisation, the question arises whether there remain substantive differences between drinking cultures among European countries. Has convergence resulted in a situation where the cultural position of drinking would seem to be similar across European countries? Survey data can shed some light on this question, and also on gender and age patterns of drinking.

Numerous typologies of the cultural position of drinking have been proposed in the literature, as recently reviewed by Room and Mäkelä (2000). In the European context, probably the most used and well known is the division between wet and dry societies. Traditionally, wet (as opposed to dry) drinking cultures were characterized by a weak (strong) temperance tradition, a high (low) volume of consumption, a low (high) proportion of abstainers, frequent fairly heavy drinking (infrequent very heavy or binge drinking), a high (low) level of problems related to chronic heavy drinking and a low (high) level of alcohol poisoning (Room and Mitchell 1972). Mediterranean countries have been presented as the main representatives of wet countries and the Nordic countries as representatives of

dry countries. The wet-dry continuum as such is problematic in today's Europe, where differences in volume and abstention no longer differentiate the traditional wet and dry countries.

Other typologies would make related divisions. Ullman (1958) spoke about "integrated" and "unintegrated" drinking customs. Mäkelä's (1983) angle was to separate different use-values of alcohol. The two most relevant ones for European drinking cultures are the use of alcohol as a nutrient and the use of alcohol as an intoxicant. An often-used typology, already mentioned, is the division of countries into "beer", "wine" and "spirits" cultures, according to the traditionally dominant beverage type (Sulkunen 1976, 1983). Partanen's (1991) analysis extracted two important dimensions of drinking cultures: the culture's "engagement with alcohol" and the typicality of "serious drinking", that is, drinking to intoxication. Similarly, Room and Mäkelä (2000) end their review by suggesting two most central dimensions of drinking cultures: the regularity of drinking and the extent of drunkenness.

The first aim of this paper is to compare drinking habits and the current differences between drinking cultures in different regions and countries in Europe. We try to describe as well as possible the two central elements of drinking cultures that were identified in the literature (1) involvement with alcohol (measures available for this are: abstention, frequency of drinking overall, to some extent also the volume of drinking) and (2) drunkenness, binge drinking, or more generally the quantity of drinking on a drinking day. In addition, we examine (3) the differences in beverage choices (beverage-specific frequency and volume), which is also an important element of drinking cultures.

On the basis of previous findings we expect that in the Mediterranean traditionally wine-drinking countries there should be more daily light or moderate drinking integrated into everyday life; i.e. that the frequency of drinking overall and that of drinking wine should be the highest there while the frequency of binge drinking and the quantities drunk per drinking day should be lowest. Similarly, we expect that binge drinking would be more common and the frequency of drinking lower in northern (former spirits-drinking) countries, while the traditional beer countries of middle Europe are expected to lie somewhere in between these two drinking cultures.

Our second interest lies in the gender differences observed in drinking habits and their comparison over countries and drinking cultures. It is of interest to see whether the gender differences in drinking are universal in that they apply to all (European) countries studied and to all measures of drinking, and to compare the magnitude of gender differences across countries and drinking measures. Have the typologies of European drinking cultures been implicitly based on the drinking of males, with a different patterning found among women, or are the cultural differences replicated in each gender?

The present analysis is part of the Gender, Alcohol and Culture: An International Study (GENACIS). This is an international collaborative study with multiple parts, one part of which is an EU-funded project focusing on comparisons between European Union member states or associated countries. The GENACIS project includes a common core questionnaire, applied as faithfully as possible in new datasets collected after its inception. However, a number of the datasets considered in the present analysis were collected before the project was fully under way, so that the availability of an item for a country, and the degree of comparability between countries varies from item to item.

The regions and countries to be included in the present analyses are the following: Former spirits-drinking countries in northern Europe -- Finland, Iceland, Norway, Sweden ('North'); Mediterranean, traditionally wine-drinking countries in the south of Europe -- France, Italy and Spain ('South'); and the larger group of European countries between these regions, which are mainly traditionally beer-drinking countries in central or western Europe -- Austria, the Czech Republic, Germany, Hungary, The Netherlands, Switzerland, UK ('Middle'); Israel was also included in the analyses ('other'). The age-range covered in the paper is 20-64 years, which is common for all countries included in the analysis (with the exception of Germany, where data are for respondents aged 20-59, and Israel, where the age range is 20-40).

2 PREVIOUS EUROPEAN COMPARISONS

A number of studies have been published where drinking habits in some European countries have been compared. However, as a recent review of all the survey-based studies of drinking habits in 15 European countries showed, studies including a relatively wide range of European countries and also a good selection of measures of drinking are rare (Simpura and Karlsson 2001). Among the more ambitious research projects is the comparison, based on existing surveys, of drinking patterns and problems, with an emphasis on women's drinking, in 9 European countries carried out in connection with the EU BIOMED-II programme (Bloomfield et al. 1999, Ahlström et al. 2001). The countries included were Finland, Sweden (Göteborg, women only; 25-year olds as the youngest age group), Czech Republic (only ages 32-43 years), Germany, Scotland (Edinburgh and Glasgow, only ages 16-30 years), the Netherlands, Switzerland, France, and Italy (Florence, excluding young people under 30 years). In the report that described drinking patterns, the measures examined were the rate of abstinence, overall frequency of drinking, overall and beverage-specific volume of drinking, and the proportion of heavy drinkers (Ahlström et al. 2001). According to the results, the rate of abstention was not particularly dependent on the drinking culture, whereas the frequency of drinking was the highest in the south and lowest in the north; among men the most popular beverage type was in accordance with the image we have of the respective drinking cultures (wine in Italy and France; beer and wine in Switzerland; beer in the rest of the countries), while among women there were deviations from this pattern: beer in Finland, beer and wine in the Czech Republic, and wine in the rest of the countries.

Two other comparisons have included countries from different regions in Europe. A Dutch research group analysed the Eurobarometer data on the 12 EC countries in 1988 (Denmark, West Germany, the Netherlands, UK, Ireland, Belgium, Luxembourg, France, Italy, Greece, Spain, and Portugal). The range of countries covered southern and middle Europe relatively well, but no northern drinking culture was represented. Measures of drinking were abstinence, frequencies of drinking wine and beer, and the context of wine and beer consumption (lunch / dinner / other). (Hupkens et al. 1993, Knibbe et al. 1996) According to the results, a larger proportion of older people than of young people consumed wine, and they did so more often than young people; a larger proportion of young than old drank beer. Men and women differed less in the frequency of drinking the beverage type that was new in the drinking culture than in the frequency of the traditional beverage type.

The most recent comparison that included countries from different regions of Europe was the so-called ECAS (European Comparative Alcohol Study) survey (Hemström, Leifman & Ramstedt 2002, Leifman 2002b). The countries selected in the comparison were Finland and Sweden as former spirits-drinking countries, former West Germany and the UK as traditional beer-drinking countries, and France and Italy as traditional wine-drinking countries. Measures of drinking covered in the summary report (Hemström et al. 2002) were abstinence, overall frequency of drinking, quantity drunk per drinking occasion, proportion of binge drinking occasions, gender and age differences in the volume of drinking overall and of drinking different beverage types, and the contexts of drinking. The comparison was made difficult by the fact that the response rate varied between about one-third (Germany, UK, Italy) and well over one-half (Finland, Sweden) and, particularly, that the coverage rate (volume of drinking in the survey as percent of official statistics) varied between about one-third (Germany, France) and an exceptionally high 96% (UK). According to the results, regular drinking was most common in southern Europe and least common in northern Europe, while the quantity reported to be drunk per occasion was the highest in northern Europe and UK. Only in these latter three countries did the youngest age group drink the most – both per occasion and on an annual basis. However, the frequency of heavy drinking occasions was the highest among young people (18-29) in all countries (with the exception of Italy).

Such a comparison was also possible among pupils aged 15-16 in the European School Survey on Alcohol and Other Drugs (ESPAD) study (Hibell et al., 1999). Among the EU countries represented in the current paper, regular drinking (10 times or more during the last 30 days) appeared to be frequent in Denmark, U.K. and Czech Republic. In contrast, very few students reported such behaviour in the Nordic countries (Finland, Iceland, Sweden and Norway). Frequent binge drinking and subjective intoxication were reported most in Denmark, U.K., the Nordic countries and the Czech Republic, and less in Hungary, France and Italy.

In addition to these studies representing a wide selection of European countries, there are others with a more limited selection of countries, representing a narrower range of drinking cultures: Hauge and Irgens-Jensen (1986, 1987) and Mäkelä et al. (1999, 2001) reported comparisons of Nordic countries; Hanhinen's (1995) comparison included Nordic countries, Italy, and Germany; Knibbe and Lemmens (1987) compared the Netherlands, Germany and Switzerland; and in the comparisons reported by Fillmore et al. (1995, 1997) and Wilsnack et al. (2000), some European countries were included in a more global framework. The latter report was particularly about gender differences in drinking and included same data from the Czech Republic (Prague), Finland, the Netherlands and Sweden (Göteborg women) as in the BIOMED II report by Ahlström et al. (2001). The report by Wilsnack et al. (2000) also included data on amount drunk per occasion. According to these results, the amount drunk per occasion among women was higher in Finland and Sweden than in the Netherlands and the Czech Republic, while among men the amount drunk per occasion was higher in Finland and the Czech Republic than in the Netherlands.

The contribution of the current report as compared to previously published reports is that it includes a better selection of drinking measures and countries with national data; it also takes a closer look at gender differences; additionally the data come from recent surveys conducted in years 1997-2002

(Austrian data is from 1993), use comparable age groups, and have been analysed centrally by one team, which improves comparability.

3 DATA AND METHODS

3.1 Data

Table 1 describes the samples used in the comparison. The surveys were independently conducted in the different countries, but the data were centrally analysed. The data were collected in all countries in the last few years of the 1990s or early 2000s, with the exception of Austria, where the data was collected in 1993. Most samples were national, with the exceptions of the Netherlands (data from a region in the southeast of the Netherlands) and Italy (data from the Tuscany region). Survey modes and the sizes of the samples varied between the countries. Response rates in those countries for which the data exist suggest relatively high response rates in general (around 70%, with exceptions).

Two sets of coverage rates are also shown in Table 1. We did not have the sales data for the regions in Italy and the Netherlands that were included in the survey, and therefore the coverage rates in these countries should be regarded with caution. For example, the Italian (Tuscany) high coverage rate may be accounted for by the fact that the numerator applies to a central wine region with a higher than average consumption while the denominator applies to whole of Italy. The first coverage rate is derived simply as the mean of estimated volume of drinking divided by estimated per capita sales. These show wide variation.

The second coverage rates are otherwise similar, but an estimate of unrecorded alcohol consumption (including, for example, imported, home-made and illicit alcohol) (Leifman 2001; WHO Global Burden of Disease Study, WHO Geneva) has been added to the denominator. The estimates of unrecorded consumption have large margins of error as compared to sales statistics, and these errors differ in size and direction from one country to another. Hence, the second coverage rate is not necessarily always better than the first one, but together they give a better picture of the coverage of the current data than either one alone. The variation in the coverage rates decreases when estimates of unrecorded consumption are incorporated. The coverage rates adjusted for unrecorded consumption are generally around 50%. These levels are typical of alcohol surveys. The coverage rate for Hungary is much lower than average (18%) and it is, after taking estimates of unrecorded consumption into account, clearly greater than average for Israel (124%), Italy (69%), the Czech Republic (69%), and Norway (67%).

The comparison of the two different coverage rates implies that in Norway and Sweden the high coverage rate is mostly accounted for by a higher than average level of unrecorded alcohol consumption. The differences in the coverage rates warn us against comparing the levels of consumption over countries on the basis of the survey estimates and also against uncritical comparison of other measures that are closely dependent on the volume of drinking.

3.2 Measurement

The main instruments used for measuring alcohol consumption varied from one country to another. Beverage-specific quantity-frequency questions were used in the Nordic countries (Finland, Iceland, Norway, Sweden), the Czech Republic, Germany and Switzerland, usually with an additional question on overall frequency. The time reference was implicitly or explicitly 12 months in Finland, Iceland, Sweden and the Czech Republic. In Norway the respondent could choose between a 1-month and a 12-month reference time, and in Germany and Switzerland a longer reference time (12 months) was only used if there was no consumption in a shorter reference time (7 days in Switzerland, 1 month in Germany). In Austria questions were asked on overall quantity and frequency in the preceding 7 days, on frequency of drinking in the past 3 months and beverage-specific quantity yesterday. The Hungarian survey used questions on 1 month beverage-specific frequency, beverage-specific quantity on last drinking occasion and 12-month overall frequency. The Netherlands had frequency and quantity in weekdays and weekends. The UK used 12-month overall frequency, 7-day recall and quantity on last drinking occasion. For France there was 12-month and 7-day beverage-specific frequency, beverage-specific quantity yesterday and overall quantity last Saturday. For Italy, no frequency data was available, but an estimate of 12-month beverage-specific volume could be used. In Spain, beverage-specific usual quantity and generic frequency were used. For Israel, beverage-specific frequency (1 month and 12 months) and overall quantity on last drinking occasion were used. The measurements and the variation within them will be described in more detail in connection with the results.

4 RESULTS

4.1 Data

In different countries there was variation in the kind of a question used to estimate proportion of abstainers. In some countries, the definition of abstinence was based on one question on overall frequency, whereas in others it is based on beverage-specific frequencies of drinking. In most cases, there was an explicit time reference to the previous 12 months, while in Switzerland this was implicit.

The estimated percentages in Table 2a imply that the proportion of current abstainers is relatively low throughout Europe among men (4-14%; exceptions are Spain 27% and Israel 26%), while there is much more variation in the proportion among women (6-31%; Spain 49% and Israel 45%). The same was true for life-time abstaining. Most typically, the ratio of female to male abstainers was around two, with smaller ratios observed particularly in northern Europe.

In northern and former eastern Europe (Czech Republic and Hungary), and additionally in UK and Spain among women, the proportion of abstainers increased with increasing age, while in other countries there was no such relationship (Table 2b). The male-female ratio of abstainers did not change systematically with age.

4.2 Overall frequency of drinking

In most countries respondents were questioned on overall frequency of drinking. In France and Norway, the maximum of beverage-specific frequencies was used instead. In Sweden, there was only a very crude measurement of overall frequency, and hence we used the maximum of this overall frequency and beverage-specific frequencies. In the Netherlands, one question was on how many weekdays the respondent drinks on the average and another on how many weekend days. The overall frequency was derived as the sum of these. The most common reference period was 12 months or 'usually' (Finland, Iceland, Sweden, Czech Republic, the Netherlands, Switzerland, UK). In Norway, the respondent could choose between a 1-month and a 12-month reference period. In Austria, Germany, France and Hungary, the frequency came from a shorter time frame (7 days, 30 days, 7 days and 30 days, respectively), but if this was zero, a longer time frame was used (3 months, 12 months and 12 months, 12 months, respectively).

In table 3a, we have depicted the frequencies in two ways: first, by the mean of the frequencies and second, by the proportion of the respondents who report weekly drinking. Each of these two approaches entails limitations, but different ones. The mean values are relatively strongly influenced by maximum values, and there was some variation in the answer alternatives for maximum frequency that could be reported (e.g. 'three times a day' in Switzerland = 365 per year vs. 'daily or almost daily' in several countries = 312 times per year). In nearly all countries, weekly drinking could be clearly defined (either 'once a week' or '1-2 times a week' etc. as answer alternatives; in Norway the question was open-ended and an annual frequency of 48 or more times was defined as weekly), but the proportions of weekly drinkers are to some extent also influenced by the next answer alternative offered to the respondents (which varied from 'several times per month' in one country to 'less often' in another). However, if results on both measures point in the same direction, this increases our confidence in the results.

Among both men and women the frequency of drinking was greatest in "middle" and southern Europe (Austria, Germany, the Netherlands, Switzerland, France, and Spain), where men reported drinking on the average once in two to three days and women reported drinking once in four to six days. Drinking frequency was clearly lower in northern Europe and Hungary (although in Hungary this could be a biased result due to the low coverage rate) (Table 3a).

Mean frequency of drinking was estimated to be 40% - 250% higher among men than among women. The gender ratio of drinking frequency was greater than average in the former eastern European countries – the Czech Republic and Hungary – and lower than average in the northern countries. The gender ratio did not change systematically with drinking frequency.

The proportion of weekly drinkers varied between countries and genders in a similar manner as did the mean frequency, although the difference between northern Europe on the one hand and middle and southern Europe on the other was somewhat smaller than for mean frequency.

The connection between drinking frequency and age varied systematically between the regions (Table 3b). In northern countries frequency tended to be either relatively independent of age or increase only

slightly with age; in the former eastern European countries and in the UK and Austria, frequency increased slightly with age. In middle Europe in general, and in France in particular, a pattern of strongly increasing drinking frequency with age was most common. Thus, the differences between European regions were also most pronounced in the oldest age group. This may be a reflection of drinking being more closely integrated with meals in southern Europe and it being less integrated into everyday life and more closely connected to celebrating or special occasions in northern Europe. The more the drinking pattern is connected with celebrating, the more it can be expected to be concentrated in younger age groups and to become a less popular activity with ageing. In contrast, when drinking is integrated with meals, there is no particular reason to expect it to become less popular with ageing but rather vice versa.

4.3 Frequency of drinking by beverage type

The frequency of drinking different beverage types could only be compared between certain countries (Table 4). France and Switzerland showed the highest and northern Europe together with the Czech Republic the lowest frequency of drinking wine, with Germany closer to the northern countries. Among men, the highest frequency of drinking beer was reported in middle Europe (Czech Republic, Germany, Switzerland). Among women, Swedes reported clearly the lowest rates of drinking beer. Like the Swiss and French women, the Swedish had a strong preference for wine. The drinking of spirits was not most frequent in any one region of Europe, but the highest reported frequencies were found among men in France, Switzerland, the Czech Republic, and Norway.

The gender difference in mean drinking frequency was by far the lowest for wine; France and Switzerland, where the frequency of drinking wine was the highest, were the only countries with a clear gender difference (Table 4). The gender ratio was generally larger for beer than for spirits, although in northern Europe in age groups over 35 years the gender difference was quite similar for both beer and spirits (tables by age group not shown).

The phenomenon of increasing drinking frequency with age was in great part accounted for by the strong increase in frequency of wine drinking with age, although the frequency of drinking spirits generally slightly increased with age as well (data not shown).

There was no systematic age pattern in the male-female ratio of drinking frequency either overall or for any specific beverage type.

4.4 Amounts drunk by beverage type

There was a large amount of variation between countries in terms of how quantities of alcohol consumed were measured -- only rarely was a direct question on a typical quantity used. We start by looking at those countries that had beverage-specific information and continue by examining what can be said about differences in quantities over beverage types.

The Nordic countries, the Czech Republic, Germany and Switzerland had beverage-specific questions on usual quantity of drinking. Additionally, Austria and France asked about quantities drunk yesterday; Hungary asked about beverage-specific quantities drunk on last drinking occasion. In Table 5 only those respondents have been included who reported some quantity for the beverage type being analyzed. For example, in Austria and France all those who did not drink wine 'yesterday' were excluded from the analysis of wine drinking quantity. Hence, the measurements in the different countries should be roughly comparable even though there may be some bias in the comparison of Austria, France and Hungary as compared to the other countries due, for example, to memory effects or a systematic difference in how the amounts on the previous drinking occasion are reported as compared to a more abstract 'typical' occasion.

Which beverages did men and women report drinking in the largest quantities (given that they drank the beverage at all)? Among men, in most cases beer was the beverage drunk in the largest quantities (Sweden, Austria, Czech Republic, Hungary, Germany, Switzerland; Table 5). French men drank wine in the largest quantities and Norwegian, Finnish and Icelandic men spirits. Among women, the beverage that was reported to be drunk in largest quantities varied more but in half of the cases was wine (Sweden, Austria, Czech Republic, Germany, France).

Gender differences in the amounts of beer and spirits drunk were clear. Thus, men reported drinking beer and spirits much more often than women (Table 4), and when they did, they reported drinking it in larger quantities (Table 5), although the gender difference for frequency was more considerable than for quantity. For wine the situation was different: men and women reported drinking wine equally often (Table 4) except in wine-drinking countries where men reported larger frequencies, and when wine was drunk, the difference between men and women in the quantities drunk was again very small, with some exceptions, among them France.

In cases where typical amounts decreased with age, this could be mainly attributed to decreasing amounts of beer drunk; for wine such a decrease in amount drunk was rather an exception to the rule; in France amounts even increased with age (data not shown).

4.5 Amounts drunk over beverage type

The beverage-specific quantities alone, without combining them with data on frequency of drinking these beverages, give us little information about the overall quantity of alcohol drunk on a typical drinking occasion in the different countries. The typical or usual quantity drunk can be estimated in several ways. For Hungary (where beverage-specific quantities on the last drinking occasion were asked) and for Spain (where we had beverage-specific quantities on a 'usual drinking occasion'), these estimates were summed to get an estimate of typical quantity. For the Netherlands, usual quantity was estimated as the weighted sum of reported typical quantities on weekdays and weekends (with corresponding frequencies as weights). For France, we combined the estimated quantity yesterday, with weight 5/7, with the estimated quantity on last Saturday (weight 2/7) (when all

quantities were 0, the observation in the French data as well as in all other data was dropped from the analysis).

In the other countries, the estimate of usual amount was obtained by dividing volume by frequency of drinking (for details about the measurement of volume, see next section). This was done in two ways. First, we calculated volume (=sum of the products of beverage-specific quantities and frequencies) divided by the sum of beverage-specific frequencies. This is the same as the weighted sum of beverage-specific quantities, with beverage-specific frequencies as the weight. Second, we calculated volume divided by an estimate of overall frequency, with the frequency estimated as the maximum of overall frequency and beverage-specific frequencies. Estimated overall frequency was smaller than the sum of beverage-specific frequencies (either due to memory bias or because different beverages are drunk on the same drinking occasion), and hence the first option generally resulted in estimates of overall quantity 30-40% smaller than the second. Only the second measure was available in countries that do not have beverage-specific data. Whenever available, both measures are shown in Table 6a.

The estimates on quantity were derived in such diverse ways in the different countries that we avoid direct comparison of countries but instead concentrate on comparing gender and age ratios. Men reported drinking 30%-140% larger quantities of alcohol than women (Table 6a). This result was not very sensitive to the choice of the denominator when estimating quantity per drinking day. No clear regional pattern was observed in the gender differences.

In general, the typical quantities drunk diminished with age; exceptions were women in Austria, Germany, and Hungary; and both men and women in France (Table 6b). The countries with the greatest reduction with increasing age in reported quantities (Norway, Sweden, Iceland, UK, Finland among both women and men) are those where drinking has traditionally been least integrated into daily life.

The male/female ratio of quantities drunk did not systematically change by age (Table 6b).

4.6 Volume

Volume was based on beverage-specific usual quantity – usual frequency questions in the four Nordic countries, the Czech Republic, Germany and Switzerland; in France, Hungary, the Netherlands and Spain, a modification of the same principle was used (France: quantities based on yesterday's consumption and frequencies on previous 7 days; Hungary: quantities based on last occasion, frequency not beverage-specific; the Netherlands: generic quantity and generic frequency were separately asked for weekdays and weekends; Spain: beverage-specific usual quantity and overall frequency). In Italy, volume estimate was based on beverage-specific volume estimates (estimated by respondents). In Austria the estimate was based on consumption during the 7 days preceding the interview; in the UK volume was based either on the preceding 7 days or a quantity-frequency estimate (if the respondent was not a weekly drinker or if that estimate was 0).

Due to the differences in measurements and in coverage rates already noted in the methods section, we concentrate here on gender ratios and age patterns, which should be less affected by differences in coverage rates.

In most countries, men reported drinking from two to even close to four times as much alcohol as did women (Table 7a). When the data were restricted to drinkers only, mean volume increased more among women than men (due to the higher rate of abstainers among women) and consequently the gender ratios decreased particularly in countries with higher rates of abstention. If a crude assumption is made that women constitute 50% of the population, the proportion of all alcohol consumed by women can be calculated on the basis of reported volume (Table 7a). There were no systematic differences between the different regions in this proportion; it varied between 12% in Hungary and one-third in Sweden and on average was around one-fourth.

The gender ratios for various beverage types varied in a similar way to frequencies of drinking (Table 7a): the highest gender ratios were observed for beer, and in some countries (Finland, Iceland, Norway, Italy) also for spirits, and the lowest for wine. When looking at the proportion of respondents who reported a relatively large volume of drinking (20 grams per day, which roughly corresponds to two drinks a day), the gender ratio was much higher than for mean consumption, and it was even higher when a higher cut-off (30 grams per day; data not shown) was selected.

Different regions in Europe showed clearly different patterns for changes in volume of drinking related to age (Table 7b). A pattern of decreasing volume by age was most common among men and women in northern countries. In the former eastern European countries (Czech Republic and Hungary) the peak was observed in the middle age group (35-49). In countries of middle Europe, the most common pattern was a slight increase in volume with age. In southern Europe the volume of drinking most often clearly increased with age, particularly among men.

Gender ratios did not change systematically with age.

4.7 Heavy episodic drinking

Again, survey questions on the frequency of drinking a large amount of alcohol on one occasion varied from one country to another with regard to the cut-point used when defining 'large' (see Tables 8a and 8b for the cut-points) and in the way the question was formulated. Therefore, we again focus on within-country comparisons of gender and age groups.

Most often, the frequency of drinking a given number of drinks (e.g. 5, 6 or 8 drinks) was asked. In Norway, there were three beverage-specific questions, with the cut-point given in litres. In Tables 8a and 8b the maximum of these frequencies was used (which results in a conservative estimate). In Hungary, the frequency used was the sum of frequencies of drinking 3-5 drinks and the frequency of drinking 6 or more drinks (where one drink is about 20 grams).

Whether heavy episodic drinking was measured by mean frequency of drinking a specified amount of alcohol on one occasion or by the proportion of respondents who reported drinking that amount monthly, men reported this activity approximately 3-6 times more often than did women (Table 8a). In northern Europe the ratio was somewhat smaller than in other countries, i.e. there was a smaller difference between men and women in drinking large amounts of alcohol. This was the case in all age groups (Table 8b).

In northern Europe there was a clear age gradient in the frequency of heavy drinking such that the frequency decreased with increasing age among both men and women (Table 8b). This was also the case in Switzerland and Israel, but not in the rest of the countries (Czech Republic, Hungary, Germany, and the Netherlands), where no systematic age pattern in heavy episodic drinking was evident.

The gender ratio increased with age throughout Europe, i.e. in the older age groups the gender gap in heavy episodic drinking was even more pronounced than among younger age groups.

5 DISCUSSION

The results obtained for the different drinking measures will be summarised here, first, with regard to what they tell us about gender differences in Europe and, second, with regard to what they tell us about regional or country differences in drinking habits.

5.1 Gender differences in drinking in Europe

The three central elements of drinking cultures that were discussed in the introduction are also relevant with regard to gender differences in drinking: 1) involvement with alcohol (abstinence, frequency of drinking, and to some extent volume of drinking), 2) drinking large amounts of alcohol on one occasion and 3) beverage choice. The questions we want to answer are: what kinds of gender differences are observed throughout Europe, and to what extent are there systematic differences between regions or countries in these gender differences? And to what extent do generations differ in this respect?

In all aspects measuring involvement with alcohol (abstinence, frequency, volume), in quantities drunk and in heavy episodic drinking there were clear and large gender differences throughout Europe. This result is in accordance with what has been observed elsewhere (Fillmore et al. 1997, Wilsnack et al. 2000). A typical male/female ratio was 2-3, although much variation was observed by country and measure of drinking; e.g. the gender ratio was generally somewhat higher for the frequency of drinking than it was for the quantity of drinking, and it was still higher for the frequency of heavy episodic drinking. The more extreme the behaviour was the higher was the gender ratio. Hence, higher gender ratios would have been obtained for e.g. heavy episodic drinking if the cut-point defining this behaviour had been set higher.

With regard to beverage types, there were pronounced gender differences for beer in particular but also for spirits, with men drinking these beverages more frequently, in larger quantities per drinking day, and in higher volumes. In contrast, women generally drank wine as often as did men, and also in equally large quantities. In men's drinking world wine, as compared to beer, is a beverage that is drunk in smaller quantities per occasion, which probably often means that it is drunk in different settings -- wine probably often consumed with meals; in women's drinking world wine is drunk in equally large or even larger quantities per drinking day than beer, which suggests that women drink wine outside of meals more often than men.

France was an exception with regard to wine. The frequency of drinking wine was the highest there, but it was also the beverage drunk in largest quantities per drinking day among French men (elsewhere it was drunk in clearly smaller quantities than beer), and the quantities of wine drunk per drinking day even increased with age (whereas elsewhere and also for other beverages in France the quantities decreased or remained at the same level). This is at least partly due to a generational effect: new generations still appreciate wine but increasingly choose quality wines rather than table wines and drink smaller quantities than previous generations (Beck & Legleye 2005). Reflecting this somewhat masculine characteristic (i.e. high quantities) of the wine drinking culture in France, men's wine drinking frequency also exceeded women's to a greater extent than elsewhere.

Hupkens et al. (1993) found that men and women differed less in the frequency of drinking the beverage type that was new in the drinking culture than in the frequency of the traditional beverage type. The current results tend to point more towards the gender differences being smallest for wine, whether or not it is a new beverage in the drinking culture.

Men's and women's difference in involvement with alcohol was smaller than average in northern countries. This could be seen both from results on abstaining and on frequency of drinking. Similarly, women's and men's difference in the frequency of heavy episodic drinking was the smallest in northern countries, which could be seen in all age groups. In contrast, gender ratios for quantity per drinking day did not differ systematically among different regions in Europe.

Across all different aspects of drinking examined here, there were surprisingly little systematic differences between age groups in the gender ratios. No systematic age patterns in the gender ratios were observable for abstaining, frequency of drinking overall or by beverage type, quantity per drinking occasion, or volume of drinking. Hence, it seems that even though many aspects of *drinking* change with age, women's and men's changes occur so that their *relative standing* remains stable, not strongly or systematically changing either with changing generations or with the life cycle.

The only dimension of drinking where a clear age pattern of gender differences was observed was the frequency of heavy episodic drinking: young men and women seem to be more alike, or rather somewhat less different, in heavy episodic drinking than are older age groups.

5.2 Differences between countries in drinking habits

We expected to find that there would be more daily light drinking integrated into everyday life in Mediterranean countries (a higher frequency of drinking overall and of drinking wine and smaller quantities of alcohol drunk on one occasion) and that alcohol would be less integrated into everyday life, more reserved for special occasions and drunk, on the average, in larger quantities on a drinking day in the northern countries, with middle European countries somewhere in between. Were these expectations confirmed in our data, and was this the case for both men and women? Are younger generations more similar across countries than older generations?

The aforementioned three aspects of drinking are of interest here, too: involvement with alcohol, drinking large amounts of alcohol on a drinking day and beverage choice. However, differences in measurement between countries pose difficulties for comparing, for instance, the level of heavy episodic drinking or volume of consumption. Therefore, comparison of reported levels of heavy episodic drinking will not be used, but differences between countries in the age patterns of abstinence, frequency, volume and heavy episodic drinking are interpreted as telling us something about how much drinking is centred around heavy episodic drinking in the different countries.

The results on regional differences in the frequency of drinking confirmed expectations and previous results (Ahlström et al. 2001, Hemström et al. 2002): the highest frequency of drinking was reported in southern and middle European countries, while the lowest frequency of drinking was reported in northern countries. Abstinence rates did not co-vary with frequency of drinking. Hence, in the European context, abstinence can no longer be viewed as a feature characterizing and distinguishing different drinking cultures, as it was in the past (Room and Mitchell 1972).

The observed regional differences in preferred beverage types were also in agreement with what was previously known. Drinking wine was most common in France and Switzerland, while it was least common in northern European countries and the Czech Republic. This can be assumed to reflect differences in how often wine is used as a mealtime beverage as well, even though drinking with meals was not specifically measured. Beer was reported to be drunk most frequently in middle Europe (Czech Republic, Germany, Switzerland) among men, and among women as well in some Nordic countries. There was no trace any longer, in the parts of Europe included in the study, of any particular 'spirits-drinking zone': the countries where spirits were reported to be drunk most frequently were found in different regions of Europe.

The examination of age patterns offers the last piece of evidence on differences in drinking habits in European countries. The interpretation of these results on age patterns can be illuminated by taking two hypothetical extreme cases of drinking cultures that are characterized by different use-values of alcohol (see Mäkelä 1983). In the first hypothetical drinking culture drinking only serves the function of an intoxicant, i.e. it is only drunk for its mood-changing effects, with nearly all drinking taking place in connection with weekends and special events and in relatively large amounts ('mood-changing model'). In this case, one would expect strong age patterns in drinking, with fewer abstainers in younger age groups, particularly among women, because refusing to drink to intoxication would in this

hypothetical extreme case mean abstention, and in the older generations, particularly among women, attitudes towards intoxication can be assumed to be stricter and the interest in this kind of drinking behaviour lower. Volume of drinking, frequency of drinking overall and of heavy episodic drinking would be expected to decrease with age, because drinking at parties and celebrations can be assumed to be more important for younger than for older people. In the other hypothetical drinking culture the sole use-value of alcohol would be that of a nutrient, with alcohol (mainly wine) only drunk in connection with meals for its nutritional and gastronomic properties ('nutritional model'). In this case the age pattern would be very different: when people get married, have children and start spending more time at home and around the kitchen table, alcohol's function as a mealtime beverage becomes more important. Hence, in this case there might not be very strong age patterns in abstinence, but frequency and to some extent volume of drinking would increase with age. In practice these two models exist simultaneously in all countries, but are more or less pronounced.

The results indicated that in northern Europe and in the UK, and to some extent also in the former eastern European countries, there was more youthful drinking: the proportion of abstainers was lower in the younger age groups in the north, east, and the UK; frequency of drinking did not increase considerably with age; volume decreased with age in northern Europe and in the UK and showed an inverse U-shape in the former eastern European countries; in northern Europe the frequency of heavy episodic drinking decreased with age, and the quantities reported to be drunk per drinking day decreased by age most in northern Europe and the UK. For southern Europe (which was in some cases represented by France only) the results were rather the opposite, and for middle European countries somewhere in between.

Hence, none of the countries examined here were such extreme cases as depicted by our 'mood-changing model' and 'nutritional model', but all countries are mixtures of these two patterns. However, there were more traces of the mood-changing model in Northern European countries and the UK, and to some extent also in former eastern European countries, while the Mediterranean countries in particular, and to some extent the Middle European countries, were somewhat closer to the nutritional model.

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6 TABLES AND FIGURES

Table 1. Survey characteristics

Country	Year	Sampling frame	Survey mode	N men 20-64 years	N women 20-64 years	Response rate %	Coverage rate	
							A*	B*
Finland	2000	National	Face-to-face	832	829	79	54	42
Iceland	2001	National	Postal+telephone	970	1086	71 / 57	63	54
Norway	1999	National	Face-to-face (with self-administration)	799	867	quota	91	68
Sweden	2002	National	Telephone	2085	2138	69	78	59
Austria	1993	National	Face-to-face	2937	3083	quota	61	57
Czech R.	2002	National	Face to face	1172	1201	73**	74	68
Germany	2000	National	Postal	3580	4327	51	57	53
Hungary	2001	National	Face-to-face (with self-administration for alcohol questions)	1055	1157	quota	24	19
Netherlands	1999	Regional (a region in the south east of the Netherlands)	Postal	1723	1911	71	57	54
Switzerland	1997	National	Telephone	4516	5332	68	55	53
UK	2000	National	Face to Face and CAPI	775	811	quota	63	53
France	1999	National	Telephone	4725	5899	71	51	47
Italy	2001- 2002	Regional (Tuscany)	Postal+ telephone	1311	1319	61	80	69
Spain	2002	Regional (Galicia, Valencia, Cantabria)	Face-to-face (sensitive questions self-administered)	688	689	quota	43	40
Israel	2001	National	Face-to-face	2383	3032	60	199	125

* A: estimated mean / recorded consumption; B: estimated mean / (recorded + estimated unrecorded consumption); Unrecorded: Leifman 2001; WHO Global Burden of Disease Study, WHO Geneva

** Only refusals were counted as non-response

Table 2a. The proportion of abstainers (%)

				Lifetime abstainers		
	Men	Women	Ratio	Men	Women	Ratio
Finland	7	8	1.1	3	4	1.6
Iceland	11	12	1.1	4	5	1.3
Norway	6	6	1.1	1	2	1.4
Sweden	8	15	1.8	3	6	1.9
Austria	-	-	-	6	16	2.8
Czech R.	9	20	2.2	3	5	1.9
Germany	4	6	1.4	1	3	1.9
Hungary	9	26	2.8	5	19	3.8
Netherlands	14	31	2.2	5	14	2.7
Switzerland	9	22	2.4	5	17	3.1
UK	8	16	1.9	8	13	1.7
France	4	9	2.1	1	3	2.3
Italy	9	23	2.5	6	18	3.1
Spain	27	49	1.8	9	20	2.3
Israel	26	45	1.8	-	-	-

Table 2b. Current abstainers (%) by age group and sex

	Men			Women			Ratio		
	20-34	35-49	50-64	20-34	35-49	50-64	20-34	35-49	50-64
Finland	4	7	10	6	5	12	1.6	0.7	1.2
Iceland	9	9	15	10	10	20	1.0	1.0	1.3
Norway	5	5	9	5	4	12	1.1	0.8	1.3
Sweden	6	8	10	13	14	17	2.3	1.6	1.7
Austria	7	5	5	17	12	19	2.4	2.6	3.8
Czech R.	9	7	12	14	19	28	1.6	2.6	2.4
Germany	5	4	5	6	4	8	1.3	1.2	1.7
Hungary	6	11	12	17	24	37	3.0	2.3	3.1
Netherlands	17	10	17	32	25	39	1.9	2.4	2.3
Switzerland	10	8	9	23	20	22	2.2	2.5	2.4
UK	7	10	8	10	13	25	1.5	1.3	3.0
France	4	4	5	11	7	8	2.7	1.7	1.8
Italy	11	8	9	22	22	24	2.1	2.7	2.8
Spain	26	27	28	41	49	58	1.6	1.8	2.1
Israel	23	33	-	45	47	-	1.9	1.4	-

Table 3a. Overall frequency of drinking (mean, times per year). All respondents.

	Mean frequency			% weekly drinkers		
	Men	Women	Ratio	Men	Women	Ratio
Finland	81	43	1.9	59	36	1.6
Iceland	50	28	1.8	38	20	1.9
Norway*	58	32	1.8	51**	27**	2.0
Sweden*	63	42	1.5	39	25	1.6
Austria	175	79	2.2	82	57	1.5
Czech R.	113	45	2.5	64	30	2.1
Germany	144	80	1.8	71	47	1.5
Hungary	78	23	3.5	46	13	3.7
Netherlands	129	74	1.7	75	52	1.4
Switzerland	151	77	2.0	73	44	1.6
UK	104	73	1.4	64	47	1.4
France*	177	94	1.9	87	63	1.4
Italy						
Spain	141	56	3	63	32	2.0
Israel						

* Frequency is the maximum of beverage-specific frequencies; for Sweden the maximum of overall and beverage-specific frequencies.

** Frequency of drinking was an open-ended question; 'weekly' was defined as 48 times or more often per year

Table 3b. Overall frequency of drinking (mean, times per year) by age and sex. All respondents.

	Men			Women			Ratio		
	20-34	35-49	50-64	20-34	35-49	50-64	20-34	35-49	50-64
Finland	76	86	80	43	44	41	1.8	2.0	1.9
Iceland	48	54	48	27	31	26	1.8	1.7	1.8
Norway*	49	62	66	29	36	32	1.7	1.7	2.0
Sweden	51	62	75	33	43	49	1.6	1.4	1.5
Austria	160	186	184	70	87	81	2.3	2.1	2.3
Czech R.	93	126	123	40	55	39	2.3	2.3	3.1
Germany	120	154	167	65	89	89	1.8	1.7	1.9
Hungary	58	91	90	20	24	23	2.9	3.8	3.8
Netherlands	96	134	154	47	88	86	2.1	1.5	1.8
Switzerland	113	156	192	56	80	100	2.0	1.9	1.9
UK	94	100	119	69	76	74	1.4	1.3	1.6
France*	125	178	243	66	96	129	1.9	1.9	1.9
Italy									
Spain	107	150	180	48	64	56	2.2	2.3	3.2
Israel									

* Frequency is the maximum of beverage-specific frequencies.

Table 4. Mean frequency of drinking (times per year) by beverage type. All respondents.

	BEER			WINE			SPIRITS		
	Men	Women	Ratio	Men	Women	Ratio	Men	Women	Ratio
Finland	65	21	3.1	16	16	1.0	18	7	2.8
Iceland	40	17	2.4	20	18	1.1	14	7	2.0
Norway	47	19	2.5	22	22	1.0	21	9	2.5
Sweden	26	8	3.4	27	32	0.9	18	8	2.2
Austria									
Czech R.	112	27	4.1	23	27	0.8	28	12	2.4
Germany	114	32	3.5	41	50	0.8	21	10	2.0
Hungary									
Netherlands									
Switzerland	95	19	4.9	113	82	1.4	34	13	2.7
UK									
France									
Italy									
Spain									
Israel	69	16	4.2	146	77	1.9	50	21	2.4

Table 5. Mean quantities per drinking day by beverage type. Beverage-specific drinkers only.

	BEER			WINE			SPIRITS		
	Men	Women	Ratio	Men	Women	Ratio	Men	Women	Ratio
Finland	39	21	1.8	26	21	1.3	49	24	2.0
Iceland	36	28	1.3	29	27	1.1	68	44	1.6
Norway	41	29	1.5	36	31	1.1	62	32	1.9
Sweden	61	29	2.1	35	35	1.0	45	27	1.7
Austria*	40	24	1.7	36	25	1.4	29	22	1.3
Czech R.	57	26	2.2	49	41	1.2	44	29	1.5
Germany	37	19	2.0	33	37	0.9	15	12	1.3
Hungary**	31	15	2.1	19	10	1.8	22	14	1.6
Netherlands									
Switzerland	25	19	1.4	20	16	1.2	17	15	1.1
UK									
France*	11	7	1.4	26	15	1.8	13	10	1.3
Italy									
Spain									
Israel									

* Based on quantity yesterday; ** Based on beverage-specific quantities in the previous drinking occasion.
In other countries based on the usual or typical quantities.

Table 6a. Quantity per drinking day. Mean values (grams of pure alcohol). Drinkers only. See text for details of measurement.

	Mean overall quantity			Quantity with sum of frequencies as denominator		
	Men	Women	Ratio	Men	Women	Ratio
Finland	59	34	1.7	42	24	1.8
Iceland	65	52	1.3	43	34	1.3
Norway	79	52	1.5	43	30	1.4
Sweden	78	53	1.5	43	32	1.3
Austria	43	28	1.6			
Czech R.***	78	51	1.5	59	36	1.6
Germany	45	36	1.2	38	32	1.2
Hungary*	35	15	2.4			
Netherlands**	41	25	1.6			
Switzerland	33	20	1.7	26	17	1.6
UK	56	31	1.8			
France*	33	18	1.9	26	13	2.0
Italy						
Spain**	37	27	1.3			

* Based on quantity on a specific drinking occasion in the near past;

** based on reported usual quantities, summed over beverage types (Spain) or weekend/weekday categories (Netherlands); others are derived as volume divided by estimated overall frequency.

*** Quantity per drinking occasion

Table 6b. Mean quantity (grams of pure alcohol) per drinking day by age and sex. Drinkers only.

	Men			Women			Ratio		
	20-34	35-49	50-64	20-34	35-49	50-64	20-34	35-49	50-64
Finland	72	54	52	41	34	28	1.7	1.6	1.8
Iceland	64	44	38	47	34	30	1.4	1.3	1.3
Norway	96	76	53	67	46	35	1.4	1.6	1.5
Sweden	107	70	55	64	52	44	1.7	1.4	1.3
Austria	45	44	40	29	29	25	1.6	1.5	1.6
Czech R.	85	80	68	56	52	43	1.5	1.6	1.6
Germany	48	42	43	36	35	36	1.3	1.2	1.2
Hungary*	39	35	30	15	16	14	2.7	2.2	2.2
Netherlands**	47	39	36	29	24	22	1.6	1.6	1.6
Switzerland	37	33	30	21	19	18	1.8	1.7	1.6
UK	67	54	45	38	31	23	1.8	1.8	1.9
France*	31	33	37	18	18	18	1.8	1.8	2.0
Italy									
Spain**	44	32	31	34	23	20			

* Based on quantity on a specific drinking occasion in the near past;

** based on reported usual quantities, summed over beverage types (Spain) or weekend/weekday categories (Netherlands); others are derived as volume divided by estimated overall frequency.

*** Quantity per drinking occasion

Table 7a. Male/female ratio of mean volume, and the proportion that exceeds 20 grams of pure alcohol per day.

	Male/female ratio of mean volume:					% drunk by women	% exceeding 20 g per day (All respondents)		
	All respondents	Drinkers only	Beer	Wine	Spirits		Men	Women	Ratio
Finland	3.1	3.0	4.7	1.4	4.5	25	20	3	6.3
Iceland	2.2	2.2	2.8	1.2	2.7	31	11	2	4.6
Norway	2.7	2.7	3.4	1.2	5.0	27	15	3	5.4
Sweden	2.0	1.8	6.2	0.9	2.3	33	15	3	5.5
Austria	3.8	3.4				21	35	6	6.0
Czech R.	3.8	3.3	8.1	1.0	3.3	21	42	10	4.2
Germany	2.2	2.2	5.3	0.8	2.7	31	32	11	3.0
Hungary	7.3	5.8				12	12	1	13.4
Netherlands	2.8	2.2				26	26	6	4.1
Switzerland	2.9	2.5	7.2	1.7	2.9	25	25	5	5.3
UK	2.5	2.3				29	29	9	3.3
France	3.7	3.5	7.9	3.7	3.7	21	33	7	4.6
Italy	2.6	2.2	2.8	2.5	3.5	28	35	9	3.9
Spain	3.5	2.5				22	23	4	5.8
Israel	3.2	2.3				24	11	3	4.2

Table 7b. Median volume (grams per day) of drinking by age and sex. Drinkers only.

	Men			Women			Ratio		
	20-34	35-49	50-64	20-34	35-49	50-64	20-34	35-49	50-64
Finland	9.7	9.6	5.5	2.9	2.2	1.8	3.3	4.4	3.1
Iceland	6.2	7.4	5.3	2.6	2.5	2.1	2.4	3.0	2.5
Norway	8.2	7.4	5.0	3.0	2.5	1.6	2.7	2.9	3.1
Sweden	9.1	7.4	7.1	4.0	3.8	3.0	2.2	1.9	2.3
Austria	14.2	17.1	14.2	2.8	2.8	2.8	5.0	6.0	5.0
Czech R.	16.0	22.9	14.7	2.9	3.8	2.7	5.5	6.0	5.4
Germany	11.3	12.5	14.5	3.7	4.8	4.6	3.0	2.6	3.2
Hungary	2.5	5.0	4.6	0.5	0.7	0.5	4.8	7.7	8.7
Netherlands	10.7	11.4	12.9	3.2	4.3	5.0	3.3	2.7	2.6
Switzerland	9.8	11.6	13.9	3.8	4.2	5.6	2.6	2.8	2.5
UK	11.4	8.8	9.1	3.2	3.4	3.4	3.6	2.6	2.7
France	5.0	8.4	23.5	1.5	2.3	2.7	3.3	3.6	8.7
Italy	9.9	13.6	31.3	2.2	3.5	12.8	4.6	3.9	2.4
Spain	10.7	16.7	17.1	4.3	4.4	4.3	2.5	3.8	4.0
Israel	3.3	2.3		0.9	0.6		3.7	3.8	

Table 8a. Mean frequency (times per year) of episodic heavy drinking and the proportion (%) that drinks X number of drinks monthly. All respondents.

Country (cut-point X *)	Frequency of X+			% drinking X+ monthly		
	Men	Women	Ratio	Men	Women	Ratio
Finland (6+; 60g)	16.9	5.3	3.2	45.6	13.0	3.5
Iceland (5+; 65g)	17.3	7.0	2.5	37.8	17.5	2.2
Norway (70 / 75 / 110g)	9.5	3.1	3.0	20.7	7.5	2.8
Sweden (5+; 60g)	12.2	3.8	3.2	17.8	3.5	5.1
Czech R. (5+; 100 / 95 / 80g)	19.6	3.7	5.2	26.1	7.9	3.3
Hungary (3+; 60g)	38.3	7.8	4.9	36.5	7.6	4.8
Austria						
Germany (5+; 70g)	23.5	4.7	5.0	40.2	11.9	3.4
Netherlands (6+; 60g)	27.0	5.6	4.8	31.3	8.0	3.9
Switzerland (8+; 80g)	3.7	0.7	5.7	6.7	1.1	6.0
UK						
France						
Italy						
Israel (5+; 60 g)	4.2	1.4	3.1	16.4	6.0	2.7

* In number of drinks and in approximate grams, separately by beverage (beer, wine and spirits) when these were asked separately. Standard drink size varies from one country to another.

Table 8b. Mean frequency of episodic heavy drinking by age and sex. All respondents.

Country (cut-point X *)	Men			Women			Ratio		
	20-34	35-49	50-64	20-34	35-49	50-64	20-34	35-49	50-64
Finland (6+; 60g)	18.6	18.6	13.4	6.5	6.2	3.2	2.9	3.0	4.2
Iceland (5+; 65g)	21.2	15.9	14.5	10.0	5.8	4.4	2.1	2.7	3.3
Norway (70 / 75 / 110g)	11.4	10.7	4.4	4.6	2.8	1.3	2.5	3.9	3.5
Sweden (5+; 60g)	16.6	12.4	7.7	6.5	3.1	1.9	2.6	4.1	4.1
Czech R. (5+; 100 / 95 / 80g)	15.6	26.0	16.9	4.1	4.4	2.5	3.8	6.0	6.6
Hungary (3+; 60g)	25.4	47.4	44.6	8.1	5.3	10.3	3.2	8.9	4.3
Austria									
Germany (5+; 50 / 100 / 25g)	23.4	24.3	22.5	5.0	4.6	4.5	4.7	5.3	5.0
Netherlands (6+; 60g)	26.0	25.9	29.4	5.6	6.6	4.0	4.6	3.9	7.3
Switzerland (8+; 80g)	5.0	3.5	2.5	0.9	0.7	0.3	5.3	5.4	7.7
UK									
France									
Italy									
Israel (5+; 60g)	4.7	3.1		1.6	0.9		2.9	3.6	

* In number of drinks and in approximate grams, separately by beverage (beer, wine and spirits) when these were asked separately. Standard drink size varies from one country to another.

Chapter 3: Drinking contexts

Drinking contexts in European countries

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1 INTRODUCTION

When we try to explain social behaviour of any sort, we usually seek to isolate its occurrence and limit its variation to two sets of factors: person factors and environmental factors (i.e. the situation or context). The conceptual and empirical focus of my paper is on the environmental factors. However, while context may hold the key to understanding drinking behaviour, no single idiom describes context. Rather, the term is a convenient label for a variety of behavioural concomitants and antecedents.

Richard Jessor (1981) has reviewed the different ways researchers have thought about and done research on drinking contexts. One level of analysis of environmental contexts seeks to capture the shared or consensual *meanings* of a situation, the "label" it carries for those who participate in it.

The notion of a "meal" is an example of the consensual meaning of a situation that carries with it implications for drinking. Another notion is a "party". People know what a meal and a party are and know that certain kinds of behaviour are permitted at parties that may not be permitted in other settings. Both "meal" and "party" have a symbolic meaning and thereby implicate the kind of behaviour expected to occur.

The most obvious way to describe the environment is to specify where the drinking occurs. The location can be private: one's own home or a friend's home; or public: a bar, pub, disco, or restaurant.

Another approach would be to classify the drinking companions. Does drinking occur with the spouse, other family members, friends, colleagues, or on one's own?

In contrast to these three levels of descriptive concepts about the environment, Jessor reminds us that there is a fourth level that is explicitly theoretical. This would be an attempt to use certain abstract dimensions or underlying attributes that can be applied to all situations irrespective of their shared significance, location, time, or company. At this third level, then, the focus is on terms like *social controls and norms* or *availability of alcohol*.

Our aim in the present paper is to compare the prevalence of different drinking contexts and to compare gender differences in the drinking contexts in European countries. The contexts examined in this paper can be divided into three broad categories: (1) circumstance (meal; party or celebration), (2) location (private locations: own home or friends' home; public locations: workplace; bar, pub or disco) and (3) drinking company (spouse or partner; other family member; other friends; colleagues or schoolmates; alone).

The following 10 European countries have been included: Iceland, Norway, Sweden, Finland, the United Kingdom, Germany, the Czech Republic, Hungary, Spain, and Italy. The main target is to study gender differences between these countries. Comparison of data varies depending on the availability of different variables in these countries.

On the basis of previous research (Ahlström-Laakso 1976, Hupkens et al. 1993) the first research question is: Is drinking most integrated into social activities in Southern European countries, less integrated in Central European countries and least integrated in the Nordic countries?

The second research question is: Is the pattern of integration similar for both genders, independent of the level of the drinking frequency in that country?

On the basis of previous research (e.g. Ahlström et al. 2001) the third research question is: Is age associated with drinking contexts in a similar way in all study countries?

2 DATA AND METHODS

The surveys have been described in detail in Chapter 1 (Data Centralization) of this report.

2.1 Age and gender

The age ranges of respondents in the study country samples varied. For the present analysis, respondents from 20–64 years of age were selected in order to increase comparability. Three age groups were used: 20–34 years, 35–49 years and 50–64 years.

2.2 Drinking contexts

Drinking contexts were described by using two questions from the GENACIS Core questionnaire. The question formulations in individual countries may have deviated somewhat from this common formulation.

The first question was: "Thinking back over the last 12 months, about how often did you drink in the following circumstances? Think of all the times that apply in each situation. For example, having a

drink with a meal in your own home should be included under both '(a) at a meal', and '(c) in your own home':

- a. At a meal
- b. At a party or celebration
- c. In your own home
- d. At a friend's home
- e. At your workplace
- f. In a bar/pub/disco
- g. In a restaurant

The second question was: "How often in the last 12 months have you had a drink when you were with the following persons? Think of all the times that apply for each person. For example, having a drink with your spouse or partner and friends should be included under both (a) with your spouse or partner, and (d) with friends":

- a. With your spouse/partner/romantic (non-cohabiting) partner whether or not other people present
- b. With a family member other than your spouse/partner/romantic (non-cohabiting) partner
- c. With people you work with
- d. With friends other than your spouse or partner
- e. When no one happened to be with you

In the GENACIS core questionnaire answers to both questions were coded according to: never in the last 12 months (1); once or twice in the last 12 months (2); three to six times in the last 12 months (3); seven to eleven times in the last 12 months (4); one to three times a month (5); once or twice a week (6); three or four times a week (7); every day or nearly every day (8). However only in the UK and Spain was core questionnaire implemented fully for both questions. In the other countries, there were no identical frequency categories available. In order to increase comparability, answers were re-coded with the aim of transforming each frequency category into days per year. The new values were chosen so that they could be understood as approximate values for class interval midpoints. Coding to days for core questionnaire answers and other details on comparability is given in Appendix B.

2.3 Statistical analyses

The mean of context-specific drinking days was calculated by gender and age among the drinking population (i.e. excluding those who had not consumed any alcohol during the past 12 months). Because this study is concerned with gender comparisons, it devotes special attention to gender ratios - that is, to the mean of men's drinking contexts to those of women. In ranking the context variables, we tried to avoid claiming two prevalence rates to be different when the estimates differed only marginally. In practice, our rule of thumb was that differences of less than 15 percent were ignored.

In order to simplify the comparison of the results by age groups age ratios were calculated - that is, the mean of the second and third age group was divided by that of the first age group.

3 RESULTS

3.1 Meals and Parties

In Table 1 the proportion of men and women and the prevalence of drinking at a meal was highest in wine countries—in other words, in Spain and Italy—than in Central European countries and was lowest in Nordic countries. The gender ratio was very high in Hungary, quite high in the Czech Republic, and lowest in the United Kingdom, Sweden and Iceland (Table 1).

The prevalence of drinking at a meal was lowest in the youngest age group in the Nordic countries and in other study countries increased with age (Table 7).

The prevalence of drinking at a party or celebration was very low in all study countries (Table 1). The gender ratio was highest in the United Kingdom and Spain and lowest in Sweden and the Czech Republic (Table 1).

The prevalence of drinking at a party was in most study countries highest in the youngest age group (Table 7).

3.2 Private places

The results for drinking at own home were similar to the results for drinking with meals. The prevalence of drinking at own home was very high in the wine countries Spain and Italy; and low in Iceland and Hungary (Table 2). The gender ratio was highest in Hungary and lowest in the United Kingdom and Sweden (Table 2).

While the prevalence of drinking at home and drinking with meals were in general close to each other, the deviations from this pattern were of interest. In Finland the gap between these two prevalence rates was greatest in the direction that drinking at home was more prevalent than drinking with meals. In contrast, in the Czech Republic, Hungary, Spain and Italy it was more common to drink with meals than at home.

In all study countries, the prevalence of drinking at own home was lowest in the youngest age group (Table 8).

The prevalence of drinking at a friend's home was low in all study countries (Table 2). The gender ratio was highest in Hungary and Spain and lowest in Sweden. In all study countries, the prevalence of drinking at a friend's home was lowest in the oldest age group (Table 8).

3.3 Public places

The prevalence of drinking at own workplace was very low in all study countries (Table 3). It was highest in Spain and non-existent in Finland. The gender ratio was highest in Spain and Hungary (Table 3).

In the United Kingdom, the prevalence of drinking at the workplace was highest in the youngest age group and in the Czech Republic and in Spain, in the middle age group (Table 9).

The prevalence of drinking in a bar, pub, or disco was highest in Spain and in the United Kingdom and lowest in Sweden, Iceland and Finland (Table 3). The gender ratio was highest in Hungary (Table 3).

In the Nordic countries and in the United Kingdom, the prevalence of drinking in a bar, pub, or disco was highest in the youngest age group (Table 9).

The prevalence of drinking in a restaurant was low in all study countries (Table 3). It was highest in Spain and lowest in Finland. The gender ratio was highest in Hungary and Spain.

In Sweden and in the United Kingdom, the prevalence of drinking in a restaurant was highest in the youngest age group, in Spain in the middle age group (Table 9).

3.4 Drinking companions

The results for drinking-with-spouse, partner or romantic, non-cohabiting partner were also similar to the results on drinking at home or drinking with meals, with drinking with partner usually somewhat less prevalent than drinking at home. The UK was an exception in that there drinking with partner was slightly more common than drinking at home. The prevalence of drinking with partner was highest in Spain and next highest in the United Kingdom (data was not available for Italy), and quite low in other study countries (Table 4). The gender ratio was highest in Spain and Hungary and lowest in the United Kingdom (Table 4). In all study countries, except Finland and the Czech Republic, the prevalence of drinking with spouse or partner increased with age.

The prevalence of drinking with a family member other than spouse, partner or romantic partner was highest in Spain and lowest in Sweden and Finland (Table 4). The gender ratio was highest in Spain and lowest in Finland (Table 4). In Spain among men, the prevalence of drinking with a family member other than their spouse or partner increased by age.

The prevalence of drinking with friends other than their spouse or partner was highest in Spain and lowest in Sweden and Finland (Table 4). The gender ratio was highest in Spain and lowest in Sweden and Finland (Table 4). In all study countries, except in the Czech Republic and among Hungarian men, the prevalence of drinking with friends other than their spouse or partner was highest in the youngest age group.

The prevalence of drinking with colleagues or schoolmates was highest in Spain and lowest in Finland (Table 4). The gender ratio was highest in Hungary and lowest in Sweden and Norway (Table 4).

The prevalence of drinking alone was highest among Spanish men and lowest among Swedish men.

The prevalence was low among women in all study countries. The gender ratio was highest in Hungary and lowest in Norway (Table 4). In all study countries among men, the prevalence of drinking without any company increased with age. Among women, the same pattern was found in most study

countries, but in Norway and the United Kingdom highest prevalence was found in the middle age group.

3.5 Most frequent drinking contexts

In the comparisons above, those countries that have a high frequency of drinking were often found to have high context-specific frequencies as well. In addition to this comparison of absolute frequencies we were interested in looking at the relative frequencies: which contexts are most and least common in different countries? The rank order of frequency of drinking in the contexts of 'meals', 'own home' and 'bar/pub' are given in Table 5 (the inclusion of other contexts would have increased the number of empty cells and would hence have complicated the comparability of the rank orders). In the Nordic study countries and in the United Kingdom, own home is the most common drinking place and drinking at a meal is the next common context. In Spain, the Czech Republic and Hungary, drinking at a meal is the most common context. In all study countries the pattern was similar for both genders.

3.6 Most frequent drinking companions

The rank order of drinking companions is given in table 6. In the Nordic countries, the United Kingdom and Spain, the most common drinking companion among men is the spouse or partner and the next common a workmate. In the Czech Republic and Hungary the most common drinking companion is a workmate and the next common the spouse or partner. In all study countries, the most common drinking companion among women is the spouse or partner and the next common a workmate. The pattern of the most frequent drinking companions is similar for both genders in the Nordic countries and the United Kingdom, but different in the Czech Republic, Hungary and Spain.

4 DISCUSSION

It is difficult to systematically compare the study countries because not all countries had all the necessary data. In addition, the categories were not identical. However, tentative answers to our research questions could be found.

In Southern Europe, in our study countries Spain and Italy, drinking was found to be integrated into many social activities. In Spain, one often reported drinking at meals, in private and public places, and with everyone from spouse to colleagues or schoolmates.

In Central European countries, in our study countries Germany, the United Kingdom, the Netherlands, the Czech Republic, and Hungary, the degree of integration in drinking was lower. But it was higher than in the Nordic countries, our study countries Iceland, Norway, Sweden, and Finland.

In addition, there were differences among the Central European countries as well as among the Nordic countries. For instance, the frequency of drinking at a friend's home was higher in Hungary than in the Czech Republic. In Norway and in Sweden, the frequency of drinking in a restaurant was much higher than in Finland.

In most study countries, the pattern of integration was similar for both genders. However, in the Czech Republic and in Hungary, workmates were more often favoured by men as a drinking companion than was the spouse. In these countries, drinking seems to be more related to men's social life than to the domestic life than in the other study countries.

In all study countries, age was partly related to drinking contexts in a similar way. The youngest age group did not report drinking at a meal and at home as often as the older ones, but they drank more often than the older age groups at parties and bars and with their friends. As age increased the importance of the spouse as a drinking companion increased.

But there were interesting exceptions. Schoolmates and colleagues were important drinking companions for young men in the United Kingdom, but in the Czech Republic and in Spain for middle-aged men.

One interesting result which needs to be commented on is the age group differences among women in the frequency of drinking alone. In all study countries, the prevalence of drinking alone increased by age, but not in Norway and in the United Kingdom where highest prevalence was found among the middle age group. A likely explanation is a generational effect that is stronger than the age effect: even if in the individuals' life courses drinking alone would increase with age, the older women drink so little that in comparison to the younger cohorts, who drink more in any context, the age pattern cannot be detected.

The degree of gender similarity in drinking patterns varied between study countries. The gender ratios in drinking context variables were very low in Iceland, Norway, and Sweden. They were of medium size in Finland, Germany, the Netherlands, and the United Kingdom. Highest gender ratios were found in the Czech Republic and Hungary. Our hypothesis, which needs to be looked at in a multi-level analysis, is that this is related to the gender equality in these countries.

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6 TABLES

Table 1. Drinking at a meal and at a party among men and women, number of days in last 12 months, mean and gender ratio

Country	Meal			Party		
	Men	Women	Ratio	Men	Women	Ratio
Iceland	20	15	1.3	8	6	1.4
Sweden	41	34	1.2	15	14	1.1
Finland	17	9	1.9			
U.K.	57	54	1.1	18	13	1.4
Germany	36	17	2.1			
Czech Rep.	100	41	2.4	11	9	1.2
Hungary	66	24	2.7			
Spain	157	87	1.8	17	12	1.4
Italy	178	130	1.4			

Table 2. Drinking in private places among men and women, number of days in last 12 months, mean and gender ratio

Country	Own home			Friend's home		
	Men	Women	Ratio	Men	Women	Ratio
Iceland	33	20	1.6	8	7	1.3
Sweden	47	37	1.3	15	15	1.0
Finland	57	32	1.8	5	4	1.4
U.K.	79	71	1.1	19	15	1.3
Germany	45	24	1.8			
Czech Rep.	63	31	2.0	12	10	1.2
Hungary	37	7	5.1	16	8	2.1
Spain	140	83	1.7	16	9	1.8
Italy	152	97	1.6			1.3

Table 3. Drinking in public places among men and women, number of days in last 12 months, mean and gender ratio

Country	Workplace			Bar, pub, disco			Restaurant		
	Men	Women	Ratio	Men	Women	Ratio	Men	Women	Ratio
Iceland	3	1	3.5	13	8	1.5			
Norway							20	17	1.2
Sweden	3	1	2.5	11	8	1.4	10	8	1.3
Finland	0	0	1.1	19	9	2.1	3	2	1.6
U.K.	8	4	2.3	57	25	2.3	15	11	1.4
Czech Rep.	11	5	2.3						
Hungary	7	1	7.1	43	8	5.2	7	3	2.5
Spain	20	2	11.7	89	38	2.4	25	12	2.1

Table 4. Drinking companions among men and women, number of days in last 12 months, mean and gender ratio.

Country	Spouse, partner			Family member			Friends			Workmate			None		
	Men	Women	Ratio	Men	Women	Ratio	Men	Women	Ratio	Men	Women	Ratio	Men	Women	Ratio
Norway	43	35	1.2	12	10	1.1	16	12	1.3	24	18	1.4	22	14	1.6
Sweden	43	36	1.2	8	8	1.0	9	7	1.3	10	8	1.2	9	5	1.8
Finland	42	32	1.3	10	6	1.6	8	3	2.5	18	8	2.3	19	7	2.7
U.K.	81	75	1.1	22	14	1.6	15	6	1.6	38	24	1.6	27	15	1.8
Germany													23	7	3.5
Czech Rep.	35	30	1.2	13	10	1.3	24	7	3.6	43	10	4.2	27	13	2.2
Hungary	25	18	1.4	17	7	2.4	20	2	9.1	40	9	4.3	39	4	9.0
Spain	123	82	1.5	35	30	1.2	59	13	4.5	72	32	4.7	52	11	4.7

Table 5. Most frequent drinking contexts in last 12 months, by gender, rank order

Country	Men			Women		
	Meal	Own home	Bar, pub	Meal	Own home	Bar, pub
Iceland	2	1	3	2	1	3
Sweden	2	1	3	2	1	2
Finland	2	1	2	2	1	2
U.K.	2	1	2	2	1	3
Czech Rep.	1	2	•	1	2	•
Hungary	1	3	2	1	2	2
Spain	1	2	3	1	2	2

Table 6. Most frequent drinking companions in last 12 months, by gender, rank order

Country	Men				Women			
	Spouse	Family member	Friends	Workmate	Spouse	Family member	Friends	Workmate
Norway	1	4	3	2	1	4	3	2
Sweden	1	2	2	2	1	2	2	2
Finland	1	3	4	2	1	3	4	2
U.K.	1	3	4	2	1	3	4	2
Czech Rep.	2	4	3	1	1	2	3	2
Hungary	2	4	3	1	1	3	4	2
Spain	1	4	3	2	1	2	3	2

Table 7. Drinking at a meal and at a party among men and women, mean number of days (in bold) in last 12 months by country, and ratio of means by age group (age group 20-34=1.0).

Country	Meal		Party	
	Men	Women	Men	Women
Iceland	20	15	8	6
20-34	1.0	1.0	1.0	1.0
35-49	1.7	1.5	0.6	0.6
50-64	1.5	1.2	0.5	0.6
Sweden	41	34	15	14
20-34	1.0	1.0	1.0	1.0
35-49	1.8	1.7	0.6	0.6
50-64	1.9	1.9	0.7	0.8
Finland	17	9		
20-34	1.0	1.0		
35-49	1.6	1.1		
50-64	1.4	1.2		
U.K.	57	54	18	13
20-34	1.0	1.0	1.0	1.0
35-49	1.3	1.4	0.5	0.9
50-64	1.4	1.7	0.5	0.5
Germany	36	17		
20-34	1.0	1.0		
35-49	2.0	1.9		
50-64	2.4	2.5		
Czech Rep.	100	41	11	9
20-34	1.0	1.0	1.0	1.0
35-49	1.4	1.6	1.1	1.0
50-64	1.5	1.5	0.7	0.9
Hungary	66	24		
20-34	1.0	1.0		
35-49	2.2	1.6		
50-64	2.9	3.4		
Spain	157	87	17	12
20-34	1.0	1.0	1.0	1.0
35-49	2.1	2.1	0.7	0.7
50-64	2.8	2.7	0.8	0.5
Italy	178	130		
20-34	1.0	1.0		
35-49	1.4	1.8		
50-64	1.7	2.2		

Table 8. Drinking in private places among men and women, mean number of days (in bold) in last 12 months by country, and ratio of means by age group (age group 20-34=1.0).

Country	Own home		Friend's home	
	Men	Women	Men	Women
Iceland	33	20	8	7
20-34	1.0	1.0	1.0	1.0
35-49	1.4	1.6	0.6	0.7
50-64	1.2	1.2	0.3	0.5
Sweden	47	37	15	15
20-34	1.0	1.0	1.0	1.0
35-49	1.8	1.6	0.8	0.8
50-64	1.9	1.9	0.7	0.8
Finland	57	32		
20-34	1.0	1.0		
35-49	1.6	1.2		
50-64	1.6	1.3		
U.K.	79	71	19	15
20-34	1.0	1.0	1.0	1.0
35-49	1.3	1.3	0.6	1.0
50-64	1.4	1.5	0.5	0.7
Germany	45	24		
20-34	1.0	1.0		
35-49	1.5	1.4		
50-64	1.8	1.5		
Czech Rep.	63	31	12	10
20-34	1.0	1.0	1.0	1.0
35-49	1.6	2.1	1.1	0.9
50-64	1.9	2.1	0.6	0.7
Hungary	37	7		
20-34	1.0	1.0		
35-49	2.1	1.1		
50-64	2.1	2.0		
Spain	140	83	16	9
20-34	1.0	1.0	1.0	1.0
35-49	2.1	1.8	0.9	0.4
50-64	2.7	2.4	0.8	0.3
Italy	152	97		
20-34	1.0	1.0		
35-49	1.6	1.8		
50-64	2.1	2.2		

Table 9. Drinking in public places among men and women, mean number of days (in bold) in last 12 months by country, and ratio of means by age group (age group 20-34=1.0).

Country	Workplace		Bar, pub, disco		Restaurant	
	Men	Women	Men	Women	Men	Women
Iceland	3	1	13	8		
20-34	1.0	1.0	1.0	1.0		
35-49	0.8	1.2	0.4	0.5		
50-64	0.4	0.4	0.3	0.5		
Sweden	3	1	11	8	10	8
20-34	1.0	1.0	1.0	1.0	1.0	1.0
35-49	0.4	1.1	0.4	0.4	0.7	0.7
50-64	1.6	0.9	0.2	0.1	0.6	0.6
Finland	0	0				
20-34	1.0	1.0				
35-49	0.8	3.5				
50-64	0.4	2.2				
U.K.	8	4	57	25	15	11
20-34	1.0	1.0	1.0	1.0	1.0	1.0
35-49	0.8	0.4	0.7	0.7	0.6	0.7
50-64	0.7	0.4	0.9	0.6	0.6	1.1
Czech Rep.	11	5				
20-34	1.0	1.0				
35-49	1.7	1.3				
50-64	0.7	0.5				
Hungary	7	1	43	8	7	3
20-34	1.0	1.0	1.0	1.0	1.0	1.0
35-49	0.9	0.3	0.9	0.2	0.5	0.5
50-64	0.7	0.1	0.9	0.1	1.2	0.2
Spain	20	2				
20-34	1.0	1.0				
35-49	2.2	0.7				
50-64	1.3	2.7				

Table 10. Drinking companions among men and women, mean number of days (in bold) in last 12 months by country, and ratio of means by age group (age group 20-34=1.0).

Country	Spouse, partner		Family member		Friends		Workmate		None	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Norway	43	35	12	10	24	18	16	12	22	14
20-34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
35-49	1.5	1.3	1.3	0.9	0.9	0.9	0.9	0.8	1.6	1.7
50-64	1.8	1.4	0.8	0.8	0.8	0.7	0.8	0.6	2.0	1.1
Sweden	43	36	8	8	10	8	9	7	9	5
20-34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
35-49	1.6	1.5	1.1	1.0	0.6	0.4	0.5	0.4	0.9	2.6
50-64	1.7	1.7	1.4	1.0	0.7	0.3	0.6	0.3	1.3	6.1
Finland	42	32								
20-34	1.0	1.0								
35-49	1.5	1.1								
50-64	1.4	1.2								
U.K.	81	75	22	14	38	24	15	6	27	15
20-34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
35-49	1.1	1.3	0.7	0.7	0.8	0.8	0.5	0.7	1.2	1.8
50-64	1.2	1.4	0.9	1.0	0.9	0.7	0.4	0.6	1.5	1.3
Germany										
20-34										
35-49										
50-64										
Czech Rep.	35	30	13	10	43	10	24	7	27	13
20-34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
35-49	1.2	1.3	1.0	1.4	1.2	0.9	1.1	1.3	2.4	3.3
50-64	1.1	0.9	0.9	1.0	1.1	0.6	0.6	0.6	3.2	3.4
Hungary	25	18								
20-34	1.0	1.0								
35-49	2.5	1.9								
50-64	3.0	3.2								
Spain	123	82	35	30	72	32	59	13	52	11
20-34	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
35-49	2.1	2.2	1.4	0.9	0.9	0.8	1.1	0.5	1.1	1.2
50-64	2.5	2.4	1.6	1.2	0.8	0.3	1.0	0.6	1.4	2.3

Chapter 4: Alcohol-related problems

The Alcohol Use Disorder Identification Test (AUDIT) in general population surveys in European countries: a first evaluation of the reliability

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1 INTRODUCTION

Prevalence estimates of problem drinking are mostly made on the basis of self reports of respondents in general population surveys. Biomedical markers for alcohol misuse have as a limitation that the time span over which alcohol misuse can be detected is restricted and covers only a restricted range of the variety of alcohol related problems (Beresford et al, 1990).

Generally speaking, two strategies have been used to measure problem drinking in population surveys. The first strategy is to focus upon the variety of problems possibly due to alcohol consumption and establish how often these occur. The advantage of a more elaborate measurement of alcohol related problems is that a more complete overview of the types of problems associated with alcohol consumption is provided. This allows for example to specify which type of alcohol related problems dominate in a particular subpopulation, region or country. The disadvantage is of course that it requires many questions. The second strategy is to reduce the variety of consequences to a limited set of items which allows establishing reliably and validly whether someone is a problem drinker. The advantage of a limited set of items to screen for problem drinking is its brevity. However, the disadvantage is of course that such an instrument is limited in taking into account the variability in the types of problems associated with alcohol consumption.

This variability is important both within and between countries. For example within some subpopulations or countries drunkenness, violence and accidents may be the most prevalent types of

alcohol related problems; in other subpopulations chronic health consequences due to excessive consumption and work related problems may be the most prevalent problems. Short screening instruments pre-suppose a uniformity in alcohol related problems within general populations. Considering the differences in drinking patterns there may be more variety in types of alcohol related problems within countries (for example between men and women, younger and older people, social classes) but especially between countries (e.g. Mediterranean countries with a higher daily consumption of wine, and Scandinavian countries with a higher frequency of risky single occasion drinking) than short screening instruments are able to cover.

Within the European context there are several countries which have a more or less established research tradition into alcohol consumption and alcohol related problems. However, there is a large variety in items countries use to estimate prevalence of problem drinking (Knibbe et al, 2003). This variety is mostly not much of a problem if evaluated from the limited perspective of each particular study. Thus, the comparability with outcomes from other studies in the same country may be seen as much more important than comparability with studies from other countries. However, there is an increasing demand for comparable prevalence estimates from different countries of Europe. The increasing number of countries of the EU may play a role in that. However, more important is a somewhat increased recognition on the European level that alcoholic beverages have not only an economic aspect but also a public health aspect. To substantiate the public health aspects of alcohol consumption on the European level, comparable estimates of alcohol misuse and problem drinking are required. The main question in this paper is whether the Alcohol Use Disorder Inventory Test (AUDIT) could possibly be an instrument to provide comparable estimates of problem drinking in general populations of different European countries. General population surveys from 10 European countries will be used in which all or most of the 10 items of the AUDIT were measured in a comparable way.

Compared with other well known screening instruments like Cage (Mayfield et al, 1974), SAAT (Davis et al, 1987), SMAST (Selzer et al, 1975) the most distinguishing characteristics of the AUDIT are that

- it has been developed to detect problem drinking in a general treatment setting; several countries were involved in the development of the AUDIT;
- it includes two types of consequences: dependence symptoms (not being able to stop, failing normative expectations and morning drinking) and harmful consequences (e.g. black outs, guilt, injuries)
- it includes also aspects of drinking pattern (e.g. frequency of drinking and quantity per occasion) (Babor et al, 2001).

The usefulness of the AUDIT in different national and cultural contexts was an important issue in the development of the AUDIT. From that point of view it is well documented how useful the instrument is in different countries. (Babor et al, 2001). However, the AUDIT was not developed to provide prevalence estimates in general populations and, with few exceptions (e.g. Ivis et al 2000), was not used for that purpose. When using it to estimate prevalence rather than for (early) detection in a treatment setting, there are two main points to consider. Firstly, the interpretation of responses to the AUDIT items is more controlled in treatment settings than in general population surveys. Secondly,

populations entering treatment settings are, compared with general populations, more likely to score uniformly rather high. We expect that in general populations there is more variation both in number of items scored and in frequency of experiencing harmful consequences. In a cross national context this variation in consequences and interrelationships between consequences is likely to be larger than in more select samples.

Differences between countries on the item level indicate national or cultural differences in the specific type of consequence most likely to be associated with alcohol misuse. Therefore such variations give a first indication of the sensitivity of the AUDIT for (sub) cultural differences in problems associated with drinking. A point of special attention in this paper will be gender differences within countries on the item level. It is well known that men and women may differ in which specific problems alcohol use may lead to. Because in almost all studies women drink less than men, such differences would not appear for some consequences as a higher prevalence among women. A better indication of the extent to which the selection of items is sensitive for gender differences is the gender ratio where items with the lowest gender ratio indicate consequences women are more likely to report.

To evaluate the whole set of items we will analyze the extent to which the items of the AUDIT constitute a scale in each of the countries. When countries differ in this aspect it will mean that scores on the AUDIT have to be interpreted differently. In countries in which the items together constitute a strong scale from a statistical point of view, one can conclude that all items indicate the same concept and drinkers can be rank ordered in severity of problems according to their score. However, countries in which the items taken together do not create a strong scale, it is doubtful whether the items all indicate the same concept and the score on the set of items does not indicate or indicates much less reliably differences in severity of alcohol problems. Of course, differences between countries in the extent the items taken together are a statistically reliable scale also influence the comparability of AUDIT scores between countries. When analyzing the reliability of the whole set of items, special attention will be paid to the contribution of the drinking indicators of the AUDIT to the reliability of the scale. The drinking indicators have been interpreted as indicating the risk on problem drinking rather than problem drinking itself. In a treatment setting such a distinction is very useful to decide which action to take. However, from a more conceptual point of view it may be that risk –indicated by the drinking indicators of the AUDIT- is a different concept from consequences or alcohol related problems. If these are different concepts it would not increase the statistical reliability of a scale when the drinking indicators are included.

The following research problems will guide the analysis on the items of the AUDIT:

- What differences are there between countries on the items constituting the AUDIT and which gender differences are there within countries on these items?
- Do countries differ in the extent the set of items constitute a (statistically) reliable scale?
- Do countries differ in how the drinking indicators used in the AUDIT contribute to the reliability of the AUDIT?

2 DATA AND METHODS

This study is based on data from the broader GENACIS project (see Chapter 2 – Data Centralization – for more information). The analyses were limited to the present European Union project study countries only. A common questionnaire (GENACIS core questionnaire) was used in most of the countries. Basic characteristics concerning the data sets are summed up in table 1.

Table 1. Survey characteristics

Country	Year	Sampling frame	Age range	Survey mode	Response rate
Switzerland	1997	National	15+	Telephone	68.4 %
Spain	2002	Regional	18+	Face to face (sensitive questions self administered)	quota
UK	2000	National	18+	Face to face and CAPI	quota
Sweden	2002	National	17+	Telephone	69.2 %
Finland	2000	National	16-70	Face to face	79.4 %
The Netherlands	1999	Regional	16-69	Postal	71.0 %
Czech Republic	2002	National	18-64	Face to face	72.6 %
Hungary	2002	National	19-65	Face to face	quota
Iceland	2001	National	18-75	Mixed (half/half postal and telephone survey)	71.0 %/ 56.6 %

The age range is about similar with the youngest age category being between 15 (e.g. Switzerland) and 19 years (e.g. Hungary) and the oldest being 64 years (Czech Republic) or older (all other countries). All surveys include both sexes and the survey year is between 1997 (Switzerland) and 2002 (e.g. Czech Republic). Table 1 shows that countries differ in mode of interview and non response rates. Therefore, surveys may differ in under-reporting of consequences (e.g. more under reporting in face to face interviews than in postal interviews) and the extent of selective non-response among heavier drinkers. We will not go into these issues here, except to point out that direct comparisons of prevalences between countries should be made with caution. For our main purpose, a first exploration of aspects of reliability, the main point is whether these surveys cover most of the variation in drinking pattern and consequences of these populations. We assume that in this respect all surveys included here are adequate.

The AUDIT consists of 10 questions of which 7 concern alcohol related consequences and 3 questions alcohol use (see tables 2 and 3). Of the 10 countries included in this study, 4 countries have included all 7 consequence items of the AUDIT; 4 countries have 6 consequence items and 1 country only 5. Table 2 shows which countries have which items. The drinking consequences were asked with direct questions (e.g. How often during the last year have you found that you were not able to stop drinking once you had started?). In all countries, except the Netherlands, the answers to the consequence items contained 5 categories ranging from 'never' to 'daily or almost daily'. However, there were considerable differences in the precise cut off points used in each country. To make the answers to these items comparable we dichotomized the answers in: "never" or "at least once in the last 12 months". There were also slight differences in the wording of questions and answer categories used to measure the drinking indicators. However, despite these differences it was possible to construct variables which were comparable over countries.

When the AUDIT is used for detection in a treatment setting the consequence items 1 to 8 (see table 2) score on a 0 to 4 scale, whereas the categories of the last 2 questions score 0 (never), 2 (yes, but not in the past year), and 3 (yes, during the past year). A sum score of 8 (men) or 7 (women) is indicative of hazardous or harmful drinking; a score of 13 or higher is indicative for alcohol related harm. However, as mentioned above, to increase comparability, we had to simplify all answer categories to questions about consequences to two response categories (never/at least once in the last 12 months). A score of 1 on consequences in our analysis covers a score of 1-4 according to the original response categories.

In all analyses, abstainers, defined as not having consumed alcoholic beverages in the last 12 months, are excluded. The data have been analyzed with SPSS 11.0 (SPSS, 2002). Cross tabulations were used when comparing prevalence on the level of items. To analyze the extent to which the items of the AUDIT constitute a scale and how much the drinking indicators contribute to this scale a reliability analysis (Cronbach's alpha) was used. A standardized alpha requires an about similar variance on the item level. It is clear that this condition is not met (see table 3). Therefore the alpha, rather than the standardized item alpha, was used as an indicator for reliability.

Table 2. Prevalences and Gender ratios for AUDIT indicator of consequences

	Switzerland			Spain			U.K.			Sweden			Finland			The Netherlands			Czech Rep.			Hungary			Iceland		
M=Male F=Female R=Gender Ratio	M	F	R	M	F	R	M	F	R	M	F	R	M	F	R	M	F	R	M	F	R	M	F	R	M	F	R
Unable to stop	5.9	2.2	2.7	5.2	4.7	1.1	12.4	6.4	1.9	6.8	4.0	1.7	16.0	8.5	1.9	6.4	6.6	1.0	8.9	4.4	2.0	6.0	2.4	2.5	14.1	7.3	1.9
Normative Expect	8.0	2.7	3.0	7.0	5.3	1.3	16.5	8.1	2.0	12.0	5.2	2.3	13.7	6.9	2.0				26.8	11.7	2.3	6.0	1.8	3.3	15.9	8.9	1.8
Morning drinking	1.4	0.2	7.0	2.6	1.7	1.5	4.0	1.0	4.0	2.6	0.4	6.5	14.8	3.2	4.6				17.6	4.7	3.7	8.9	2.2	4.1	11.0	2.4	4.6
Guilt/ Remorse	6.4	2.3	2.8	7.5	6.5	1.2	16.5	11.1	1.5	9.9	6.8	1.5	39.4	25.9	1.5	9.3	7.1	1.3	29.9	18.9	1.6	6.6	2.3	2.9	26.4	19.3	1.4
Blackout	7.6	1.8	4.2	10.4	7.7	1.4	25.7	12.8	2.0	18.0	9.2	2.0	42.6	18.0	2.4	16.5	9.3	1.8	30.8	14.3	2.2	8.7	3.0	2.9	22.1	13.4	1.7
Injured	1.6	0.7	2.3	4.2	1.3	3.2				3.3	1.4	2.4	21.5	10.7	2.0	1.9	2.3	0.8	19.7	6.1	3.2	0.9	0.4	2.3	9.2	4.9	1.9
Comments	5.6	2.1	2.7	5.1	4.3	1.2				4.7	2.1	2.2	17.6	5.6	3.1	8.8	3.2	2.8									

3 RESULTS

3.1 Consequences measured with the AUDIT

In table 2 the proportion of men and women and the gender ratio in each country reporting consequences are presented. If we focus on men first, it appears that black out is the most often reported consequence except in Switzerland, Hungary and Iceland where it is the second most often reported after normative expectations (Switzerland), morning drinking (Hungary) and guilt/remorse (Iceland). Although there is some uniformity over countries in which consequence men are most likely to report, differences in prevalence on each of the consequences are large. For example for black outs the prevalence among men ranges from 42.6% (Finland) and 30.8% (Czech Republic) to 8.7% (Hungary) and 7.6% (Switzerland). For women there is somewhat more variability in items most often reported as a consequence. Blackouts are the consequence most often reported by women in 5 countries (UK, Sweden, Netherlands, Spain and Iceland); in Finland and Czech Republic it is the second most often reported consequence. Guilt or remorse is the most often reported consequence by women in Finland and the Czech Republic and the second most often reported consequence in Spain, U.K., Sweden and Hungary.

For most items the gender ratios are higher than 2.0. In all countries except Hungary and the Netherlands, the gender ratios of "guilt and remorse" are smaller than for the other consequences. For "morning drinking" the gender ratio tends to be highest ranging from 1.5 (Spain) to 8.0 (Sweden). In most countries (almost) all items show gender differences of 2 or higher. The exceptions are Spain, Iceland and the Netherlands. In Spain and Iceland only for 1 of the 7 (Spain), 6 (Iceland) or 5 (Netherlands) items is a gender ratio higher than 2 found. Gender differences tend to be highest in Switzerland (2.3-7.0) and Hungary (2.4-4.3).

3.2 AUDIT indicators for drinking

In table 3 the prevalences for the AUDIT indicators for drinking are presented.

Table 3. Prevalences and Gender Ratio's for AUDIT indicators of drinking

	Switzerland			Spain			U.K.		
M=Male F=Female R=GenderRatio	M	F	R	M	F	R	M	F	R
Freq: ≥ 2/week	79.4	55.6	1.4	59.0	28.0	2.1	63.7	44.4	1.4
Quantity/ Occasion: ≥ 5	11.6	2.5	4.6	19.6	6.4	3.1	7.0	1.0	7.0
≥ 6 drinking ≥ 1/month	7.6	1.2	6.3						

	Sweden			Finland			The Netherlands		
M=Male F=Female R=GenderRatio	M	F	R	M	F	R	M	F	R
Freq: ≥ 2/week	20.3	12.5	1.6	60.6	37.2	1.6	48.7	25.1	1.9
Quantity/ Occasion: ≥ 5	27.1	7.7	3.5	39.4	16.9	2.0	23.5	5.8	4.1
≥ 6 drinking ≥ 1/month	34.3	12.5	2.7	53.5	18.4	2.9	30.9	7.9	3.9

	Czech Republic			Hungary			Iceland		
M=Male F=Female R=GenderRatio	M	F	R	M	F	R	M	F	R
Freq: ≥ 2/week	62.0	30.7	2.0	43.2	11.2	3.9	36.8	18.8	2.0
Quantity/ Occasion: ≥ 5	60.2	24.9	2.4	19.0	1.7	11.2	33.1	21.3	1.6
≥ 6 drinking ≥ 1/month	26.2	8.0	3.3	35.3	9.2	3.8	35.3	18.0	2.0

In all countries the drinking indicator on which the highest percentage scores is frequency of drinking, except Sweden where the percentage drinking 5 or more glasses per occasion exceeds the percentage drinking ≥ 2 times a week. In Switzerland the percentage of men and women drinking ≥ 2 times a week is highest. The lowest percentages of drinking ≥ 2 times a week are found in Sweden and (for women only) Hungary.

Drinking 5 or more glasses per occasion (quantity/occasion) is most often reported by men and women in Czech Republic (60.2% and 24.9%) followed by Iceland (men: 33.1%; women: 21.3%) and Finland (men: 39.4%; women: 16.9%). For 6+ drinking the highest percentages are found for men and women in Finland, Iceland and Sweden. In all countries gender differences are lowest for frequency of drinking. In Hungary comparatively high gender ratios are found for all drinking indicators. Compared with table 3, much higher percentages score on the drinking indicators. This indicates already to some extent that the consequence items select much more specific categories of drinkers than the drinking indicators do. To which extent the combination in one scale of very sensitive indicators like the drinking indicators and much more specific indicators like the consequences included in the AUDIT improves the reliability is one of the subjects of the next section.

3.3 Reliability of the AUDIT in European countries

Table 4 offers an overview of the AUDIT items covered in each country (labeled by +) and two Cronbach alpha coefficients for each country: one computed with consequences only and one computed with both consequences and drinking indicators. We have also specified in the table the worst items from a statistical point of view. The criterion was that exclusion of these items would increase the Cronbach alpha value.

Table 4. Reliability of AUDIT items

	Switzer-land	Spain	U.K.	Sweden	Finland	Nether-lands	Czech Republ.	Hungary	Iceland
Unable to stop	+	+	+	+	+	+	+	+	+
Normative Expect	+	+	+	+	+	-	+	+	+
Morning drinking	+	+	+	+	+	-	+	+	+
Guilt/remorse	+	+	+	+	+	+	+	+	+
Blackout	+	+	+	+	+	+	+	+	+
Injured	+	+	-	+	+	+	+	+	+
Comments	+	+	-	+	+	+	-	-	-
Freq: ≥ 2/week Audit 3-4	+	+	+	+	+	+	+	+	+
Quantity/ Occasion: ≥ 5 Audit 2-4	+	+	+	+	+	+	+	+	+
≥ 6 drinking ≥ 1/month Audit 2-4	+	-	-	+	+	+	+	+	+
Alpha Cronbach: Conseq. Only	0.61	0.70	0.74	0.69	0.78	0.59	0.75	0.68	0.73
Alpha Cronbach: + drink. Indic.	0.58	0.62	0.69	0.71	0.81	0.63	0.77	0.68	0.76
Worst items	injury critic freq.		freq.	freq.	injury freq.		injury	injury freq.	guilt/ remorse

Cronbach's alpha, computed with only the consequence items, is lower in Switzerland (0.61) and the Netherlands (0.59) compared to all other countries (0.68-0.78). For the Netherlands this is mostly due to the smaller number of items. When for countries other than the Netherlands Cronbach's alpha is computed for the same selection of consequences, the differences between countries in the alpha are less than <0.05 (results not presented). For Switzerland it can be concluded that, compared with other European countries, the interrelations between the consequence items are lower than in all other countries.

The inclusion of the drinking indicators in the scale leads in three countries (Switzerland, Spain, U.K.) to a lower Cronbach alpha. In one country (Hungary) Cronbach's alpha does not change and in 5 countries (Sweden, Finland, Netherlands, Czech Republic and Iceland) the alpha only marginally increases.

Inspection of how each item contributes to Cronbach's alpha shows that in 5 countries (Switzerland, U.K., Sweden, Finland, Hungary) the alpha would actually improve when frequency of drinking is left out. Another item which in 4 of the 9 countries (Switzerland, Finland, Czech Republic, and Hungary) decreases Cronbach's alpha is injury due to drinking.

To sum up these results: in Switzerland the consequence items of the AUDIT perform less well as a scale than in the other countries. When the drinking indicators and consequences are combined, the items indicating alcohol consumption do not contribute or only marginally contribute to Cronbach's alpha. This appears to be the case especially for frequency of drinking. Another item which in most countries does not contribute to a more reliable measurement is injury due to drinking.

4 DISCUSSION

On the level of the individual consequence items, the countries differ not very greatly in which consequence is most likely to be reported. For men this is in most countries "having black outs". Among women "black outs" and "guilt and remorse" are most often reported. Although differences in which consequence is most likely reported are not very large, the countries differ considerably in the percentages reporting consequences. In Finland and Czech Republic percentages of men and women reporting consequences tend to be highest while in Switzerland, Spain and Hungary mostly smaller percentages of men and women report consequences. On the item level there is at face value enough variation over countries in pattern of responses to the consequences and gender differences in consequences to trust that the set of items indicating consequences is responsive to national and gender differences in problem drinking. Of course this responsiveness does not mean that the selection of items adequately measures problem drinking in each of the countries. This point can be illustrated with the outcome that in 4 of the 9 countries injury due to drinking decreases the Cronbach's alpha. This indicates that in 4 of the 9 countries the selection affirming injuries does not overlap or only minimally overlaps with the selection reporting the other consequences. Or, to say it differently, in those four countries injury due to drinking cannot be interpreted in terms of adding to severity of problems as measured with the other consequence items. This outcome reminds us of a limitation of short screening instruments. The variability in alcohol related problems across countries may be larger than a short screening instrument is able to cover.

For the drinking indicators much higher percentages scoring above cut off points were found, especially for frequency of drinking twice a week or more often.

The main outcomes on the reliability analysis are:

- In Switzerland Cronbach's alpha is lower than in the other countries.
- Combining the drinking indicators with the consequences in one scale leads either to a decreased reliability coefficient or only a marginally improved coefficient.
- The worst items in terms of decreasing the reliability coefficient are "frequency of consumption" (in 5 countries) and "injury" (in 4 countries).

It is clear that the whole AUDIT should not be used to derive reliable estimates of problem drinking in a cross national context. However, the outcomes also show that the AUDIT is a very promising starting point to provide cross national comparisons for problem drinking if:

- Only the consequence items are used; and the drinking indicators are not used to determine the prevalence.
- Injury is not included as a consequence item to determine the prevalence.
- When interpreting cross national prevalence differences between countries, the interrelations between consequences are taken into account.

Considering the large variety in drinking patterns within Europe and the large variety of ways in which drinking can lead to harmful effects, it is a good start that a relatively small selection of consequences seems to reliably indicate problem drinking in several countries. Of course it does not solve the problem that from a more national perspective, other instruments may more reliably indicate the prevalence of problem drinking. Also, the problem of cross national and/or cultural variability in interrelations between consequences is an important issue. From a methodological point of view the way forward is probably that the relationship be investigated between nationally favored measurements of problem drinking and an international standard of items reliably indicating problem drinking. In that way cross national comparable prevalence estimates could be made, but also the loss of information for each country when using the international standard can be specified. Additionally, an important next step is to examine the AUDIT further with regard to its gender sensitivity across countries. This would be an appropriate undertaking for the broader GENACIS project which has access to a larger number of country data sets with adequate sample sizes for both men and women that is a necessity for such an analysis.

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Chapter 5: Alcohol-related violence

A comparison of alcohol-related aggression in six European countries

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1 INTRODUCTION

Violence is an important public health issue, because of its effect on victims and the related costs for society and inflicted individuals, and also because of the fear or sense of insecurity it brings to the community (Golding, 1996). Many studies have found a link between drinking and violent/aggressive behaviour (see e.g. Graham et al., 1996; Maffli & Zumbrunn, 2002; Pernanen, 1996), and about 50% of violent crimes involve a perpetrator and/or victim who has consumed alcohol prior to the incident, although this percentage varies across countries (Graham & West, 2001; Murdoch et al., 1990). At the same time, it is clear that alcohol consumption is neither a necessary nor a sufficient cause of violence (see e.g. Plant et al., 2002).

Although alcohol is not a sufficient cause of aggression, it does appear to play a contributing role. Bushman (1997) concluded, from a meta-analysis of over 60 experimental studies in the field of human aggression and alcohol that alcohol contributes to aggression in a causal way. However, the relationship between alcohol consumption and aggression is moderated by a number of factors including provocation (Bushman, 1997) and other factors in the environment (Graham et al., 1980; Homel & Clark, 1994), as well as by characteristics of the drinker – such as aggressive personality (see review by Graham et al., 1998), including a stronger effect of alcohol on aggression for men than for women (Bushman & Cooper, 1990; Giancola et al., 2002).

Aggression and violence encompass a wide range of behaviors. The nature and form of aggression tends to vary according to perpetrator, victim, and situation, e.g. domestic violence versus a fight between teenage boys outside a disco on a Friday night (Graham & Wells, 2001; Graham et al., 2002). Also, the frequency of violence varies among cultures, countries, groups and times. In the Nordic countries comparatively few people responding to surveys report incidents of violence during the last 12 months. In Norway, 3% of the adult population reported having experienced violence during the last 12 months, in 1989-90 (Pernanen, 1996). The corresponding figures for Sweden and Finland were 2.7% and 3.5% respectively. In the U.S. and New Zealand – by comparison – 12-month prevalence of violence victimisation exceed 5%. Figures from different studies, however, show

considerable variation in rates, partly due to differences in questions used to measure violence. For example, another Swedish study from 1991 found that 7% of Swedes claimed to have been subjected to violence or threats of violence during the last 12 months, and despite comparable rates of violence in Norway and Sweden, fear for violence is more common in Sweden (29% of women) than in Norway (15%, Pernanen, 1996).

The culturally-based differences in drinking patterns are undisputed (see e.g. MacAndrew & Edgerton, 1969; Wilsnack et al., 2000), and cultural context is an important factor in the occurrence of alcohol related violence (see e.g. Lenke, 1989; Murdoch et al., 1990; Room & Rossow, 2001). Drawing on a discussion by Room and Mäkelä (2000) on “banalized drinking,” we could expect a less pronounced relationship between alcohol and violence in a “wet” culture, where alcohol and drinking tend to be more common and “banalized”.

In a Swiss study (Maffli & Zumbrunn, 2002) a group of women and men in treatment for alcohol related problems displayed very high prevalences of domestic violence experiences. This is in line with previous research findings that individuals who become aggressive when they drink are more likely than nonaggressive drinkers to report a history of heavy drinking or alcohol problems (Graham et al., 1998; Graham & West, 2001).

2 AIMS FOR THE PRESENT STUDY

The primary aim for the present study is to assess the relationship between alcohol consumption, gender and aggression across different countries. We hypothesize that (1) heavier drinkers will be more likely than lighter drinkers to report alcohol-related aggression for both men and women and (2) that men will be more likely to engage in alcohol-related aggression than women.

3 DATA AND METHODS

A set of questions relating to different kinds of aggression and violence from partner/to partner by subject and possible connections to drinking form the basis for this chapter, together with two other items from the questionnaire – measuring alcohol-related aggression. Information on variables and countries included in the analysis is presented in Appendix C.

3.1 Data on partner violence

There is no existing standardized measure for assessing partner aggression that allows investigation of the role of alcohol at the time of the incident. The widely used Conflict Tactics Scale (CTS, Straus et al., 1996) does not focus on the process of particular incidents of partner aggression. In addition, the CTS may produce misleading findings that imply that gender differences in violence are minimal (Dobash et al., 1992; Kaufman, Kantor & Jasinski, 1998).

In the approach used by Harris (1992) and more recently by Gondolf and Beeman (2003), and Leonard, Quigley and Collins (2002), the respondent is asked to describe “the most aggressive thing

that has ever been done to you". This approach allows further probing regarding details about specific incidents (such as whether the participants had been drinking) and was, therefore, adapted for use in the GENACIS project to apply to someone in an intimate relationship. A two-year time frame was chosen to maximize the period time covered in order to capture as many incidents as possible while ensuring that the incident was sufficiently recent to be accurately recalled and also relevant to the respondent's current circumstances. Respondents were asked whether the incident they described was by a current partner as well as frequency of aggression by current partner.

To assess the relationship between alcohol use and the nature of aggression, respondents were asked whether they or the other party involved had been drinking at the time of the incident. To assess the impact and severity of aggression, respondents were asked to rate the severity of the partner's aggression and their own aggression toward a partner from (1) minor to (10) life-threatening.

3.2 Alcohol-related aggression data

Two items from other sections of the questionnaire were included in the analyses (see Appendix): (1) When you drink, how true is it that you generally become more aggressive toward other people (usually true or sometimes true vs. never true)? (2) In the last 12 months, have you gotten into a fight while drinking?

A version of question 1 was asked by four countries: UK (asked of current and former drinkers), Sweden (asked of sub sample of current drinkers), Czech Republic (asked of everyone), and Hungary (asked of everyone??). The Swedish survey used slightly different wording -- "drinking generally makes you more aggressive toward other people". For Finland a mixture of two items were used to construct a dichotomous (yes or no) indicator for becoming aggressive in connection with alcohol consumption. These two items were:

Next I shall mention some situations which may arise when using alcohol. Mark for each whether you have found yourself in similar situations during the past 12 months...

- A) you have been caught in a scuffle or fight?
- B) quarrel or argument

A version of question 2 was included in surveys from six countries (Germany, UK, Sweden, Finland, Norway, Czech Republic); however, the samples and format of the question varied. The German survey used the wording "physical altercation due to alcohol". Finland used the wording "Next I shall mention some situations which may arise when using alcohol. Mark for each whether you have found yourself in similar situations during the past 12 months -- Have you been caught in a scuffle or fight?" Norway used the wording "In connection with your own use of alcohol have you over the last 12 months come to blows or got into a fist fight". For most countries, the question was asked only of those who consumed alcohol in the past 12 months. In the UK, however, former drinkers were also asked the question and in Norway all respondents were asked.

3.3 Measures of drinking

Three indicators of drinking pattern were used for the study: (1) abstainer vs. current drinker; (2) "risky drinking" – average consumption of more than 20 grams of pure alcohol per day for women or more than 40 grams of alcohol per day for men¹; (3) heavy episodic drinking² monthly or more often.

3.4 Data analyses

Descriptive results are presented on all variables by gender and country, by whether the respondent is a risky drinker and by abstainer/drinker status where appropriate. Logistic regression analyses were used in the analyses of partner aggression to evaluate the role of gender, age, drinking pattern and partner's drinking within the same model.

4 RESULTS

The results are presented in two parts. The first part focuses on experiences of partner aggression based on responses from the Czech Republic and the United Kingdom. The second part includes responses to two indicators of alcohol-related aggression: becoming more aggressive when drinking and getting into a fight after drinking.

Part 1. Partner aggression

Figure 1 shows the percent of male and female respondents who reported being the victim of physical aggression by a spouse/romantic partner in the previous two years for the UK and the Czech Republic, with the darker parts of the bars indicating the proportion who reported that this aggression was severe (i.e., rated the aggression as ≥ 5 on a scale of 1-10). In the UK, more men than women reported that their partner had been aggressive while the opposite was true for the Czech Republic. Severe aggression was less frequent than nonsevere, especially for partner aggression reported by Czech men. In general, women reported more severe aggression by partners than did men.

In terms of frequency of aggression by current partner, most times the aggression was by the current partner, with female respondents being more likely than male respondents in both countries to report that the aggressor was a current partner (70% for UK men, 81.3% for UK women, 74.8% for Czech men and 77.3% for Czech women). As shown in Figure 2, UK respondents were more likely than Czech respondents to report that physical aggression by the current partner had happened once in the past two years, while Czech men and women were more likely to report that physical aggression had happened two or more times, with substantial proportions reporting that aggression had happened 4

¹ To construct these indicator different questions were used for different countries, see chapter one.

² Definition of "heavy episodic drinking" varies between countries. Most use about 60 grams of alcohol as cut off point.

or more times (21.4% of Czech women and 14.1% of Czech men).

Figure 3 shows the proportion of respondents and/or partners who were drinking at the time of the incident among those who reported aggression by a partner. As shown in this Figure, overall, alcohol was more likely to be involved in incidents reported by Czech men and women than by men and women from the UK. Among male respondents from the UK who reported any alcohol use at the time of the aggression, most said that both had been drinking; for male respondents from the Czech Republic, most reported that only they were drinking at the time (i.e., the male respondent was drinking and the partner was not at the time that the partner was physically aggressive toward the respondent). Women from both the UK and the Czech Republic were more likely than their male counterparts to report that only the partner was drinking at the time that he was aggressive toward them. As shown in Figures 4 and 5, current drinkers were more likely than abstainers and risky drinkers were more likely than non-risky drinkers to report aggression by a partner. This effect was similar for those who reported partner aggression based on whether their partner was a risky drinker (See Figure 6).

Logistic regression analysis, with partner aggression (experience of partner aggression or not, last 2 years) as the criterion variable and age, gender, binge drinking (only available for the Czech Republic), risky drinking, and partner's risky drinking as predictor variables, led to similar results for both countries. ~~Younger age, and heavier drinking (by respondent as well as partner to respondent)~~ were related to reports of partner aggression. In addition, gender was significantly related to experiencing partner aggression in the Czech Republic when age and drinking pattern were controlled for, with females more likely to report aggression by a spouse or partner. While men in the UK were more likely than women to report partner aggression overall, this difference became nonsignificant when age and drinking variables were controlled for.

Part 2. Becoming more aggressive when drinking and fights after drinking

How true is it that when you drink you become more aggressive toward other people?

Figure 7 shows the proportion of male and female respondents in each country who reported becoming more aggressive toward other people at least sometimes when they drank, by whether the respondent was a risky or non-risky drinker. As shown in this Figure, rates of becoming more aggressive when drinking are much higher for risky drinkers among both women and men. Within each country, there was a general pattern for a larger proportion of men to report becoming aggressive when drinking, except that the proportion who became aggressive when drinking was actually higher among risky drinking women in the UK and Finland than among their male counterparts. Gender differences in becoming aggressive when drinking appeared strongest for the Czech Republic and Hungary.

Finnish figures are surprisingly high, especially as respondents in Finland were asked about "last year" instead of "generally".

In the last 12 months, have you had any of the following experiences ... Have you gotten into a fight while drinking?

Figure 8 shows a very strong and consistent effect of risky drinking, with getting into a fight when drinking much higher for men who consume more than 40 g. of alcohol per occasion and women who consume more than 20 g than for men and women who consume less than these amounts. There was also a large and consistent effect within countries for men to be more likely than women to get into a fight while drinking. There were considerable differences in overall rates across different countries, with Germany especially low; however, it should be noted that country differences on this variable may be partly attributable to differences in wording of this question and whether the question was asked of both current and former drinkers.

5 CONCLUDING REMARKS

Alcohol consumption was related to spouse/partner aggression, with current drinkers more likely than abstainers to have experienced partner aggression and risky drinkers more likely than nonrisky to report partner aggression, even when age and gender of the respondent were controlled for. Most respondents reported aggression by a current partner and risky drinking by the spouse/partner was also predictive of aggression by the partner. In terms of becoming aggressive when drinking and getting into fights, these behaviours were much more likely among risky than non-risky drinkers for both men and women and across all countries. While these results are correlational and do not necessarily mean that alcohol causes aggression, they are consistent with much other research showing a link between drinking pattern and aggression (Pernanen, 1991).

In general, alcohol-related aggression was more likely among males than females from the same country, with the exception of partner aggression by the UK (higher for female partners although this effect disappeared in the multivariate model) and becoming aggressive when drinking which was higher for female risky drinkers than for male risky drinkers in the UK and Finland.

Country differences need to be interpreted with caution given differences in wording of items and sampling. With this caveat, the following trends seemed apparent. First, about the same proportion of women in the UK reported partner aggression as did women in the Czech Republic; however, women in the Czech Republic reported more frequent aggression by their current spouse and were more likely to report that only the partner had been drinking when he was aggressive. Men in the UK were more likely than men in the Czech Republic to report aggression by their partner and were more likely to report that both had been drinking, while Czech men were more likely to report that only they themselves had been drinking. Finally, alcohol was more likely to be involved in partner aggression among Czech respondents (both men and women) than among respondents from the UK. While the differences in findings for these countries should be interpreted with caution, they suggest that country differences in partner aggression are related to both gender and drinking.

Country differences on becoming aggressive when drinking and getting into fights are even more difficult to interpret as there were considerable variations in who was asked the question and wording of the question. There was some evidence that gender differences in becoming aggressive when drinking were greater in the Czech Republic and Hungary and lesser in the UK, Sweden and Finland. Despite overall country differences in fights after drinking and variations in methods and measures,

the rates among male risky drinkers in the UK, the Czech Republic, Norway and Sweden tended to be similar. These results demonstrate the importance of controlling for both gender and level of alcohol consumption when comparing across different countries.

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7 TABLES AND FIGURES

Figure 1. Percent of respondents who reported that the most physically aggressive thing done to him or her during the last 2 years by someone who was or had been in a romantic relationship with him/her showing percent who rated aggressive act as non-severe aggression (i.e., < 5 on a scale of 1-10 where 1 is minor aggression and 10 is life-threatening aggression) or severe (≥ 5)

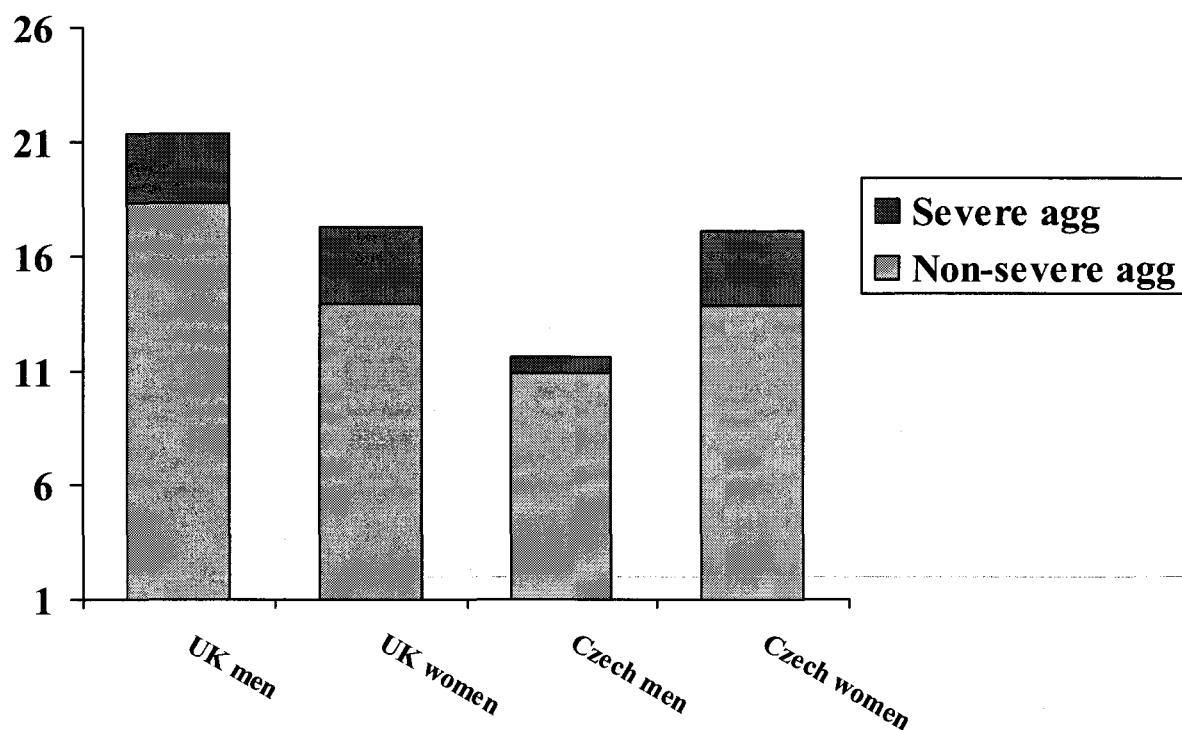


Figure 2. Percent reporting whether the aggressive was done by the respondent's current spouse/partner showing whether this person had been physically aggressive toward the respondent once in the past 2 years, 2-3 times or 4 or more times

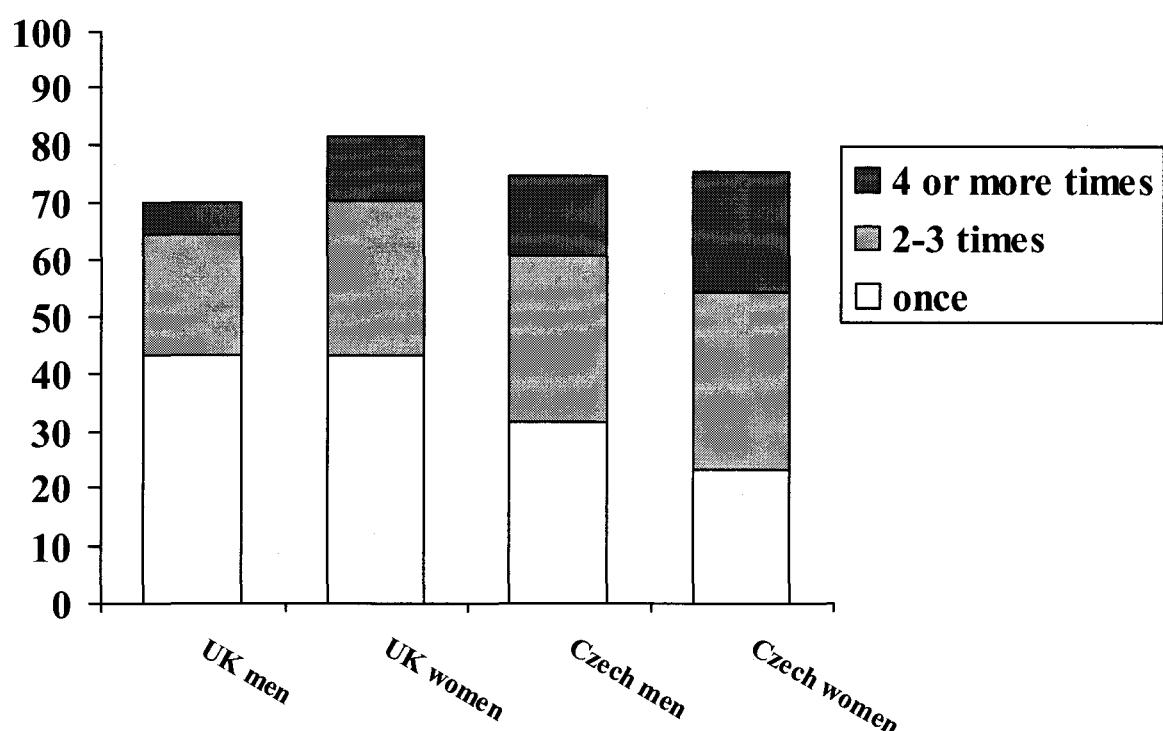


Figure 3. Percent of incidents involving alcohol showing whether both respondent and partner had been drinking, respondent only drinking, or partner only drinking

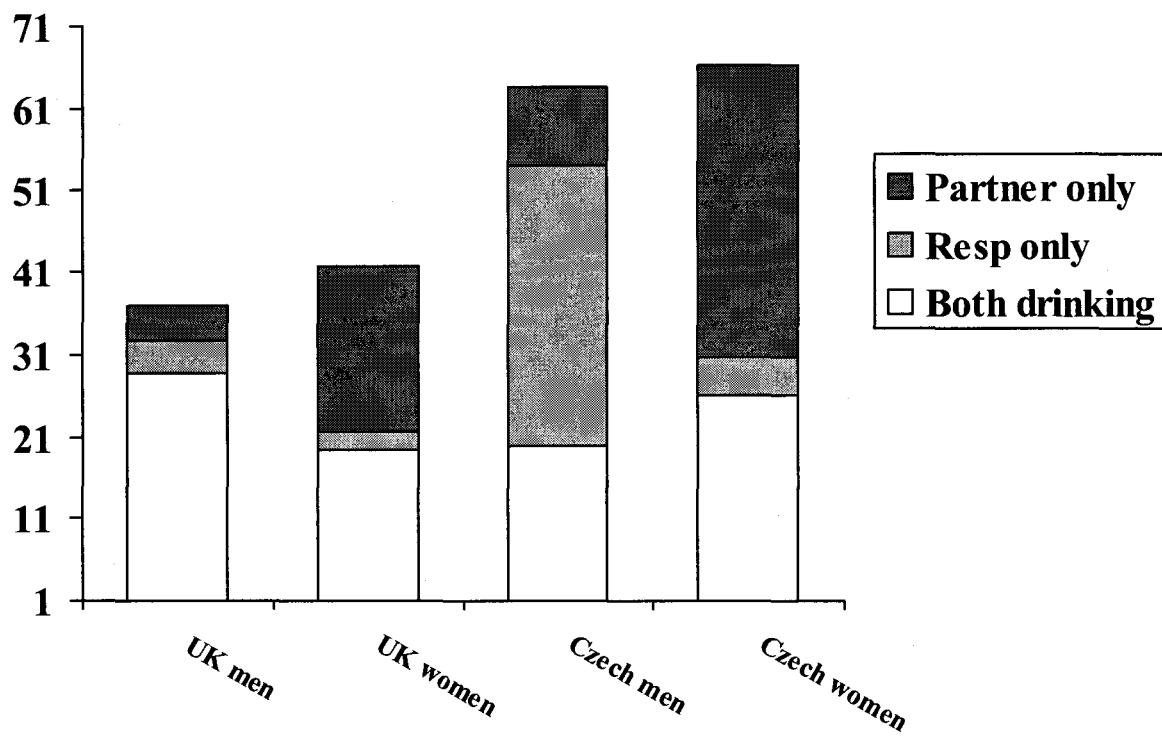


Figure 4. Percent of abstainers, former drinkers and current drinkers who reported physical aggression by partner

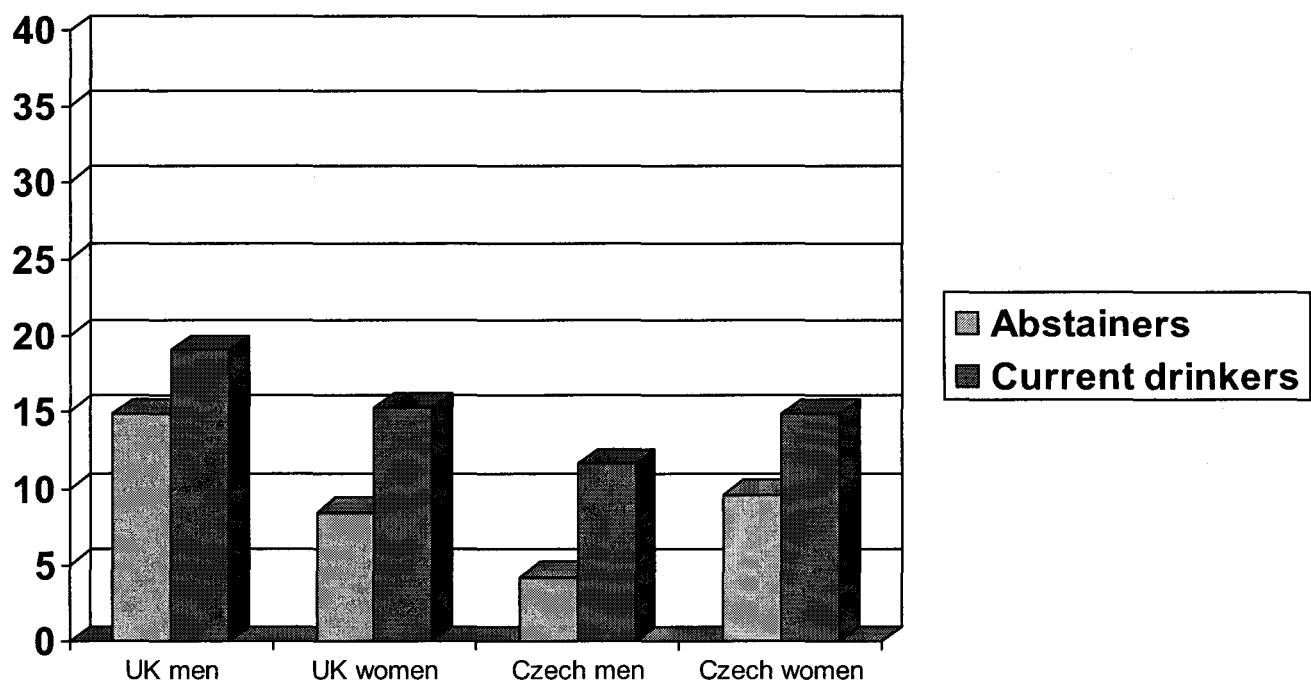


Figure 5. Percent of risky drinkers (> 20 g. alcohol daily for women and > 40 g. for men) versus non-risky drinkers who reported physical aggression by partner

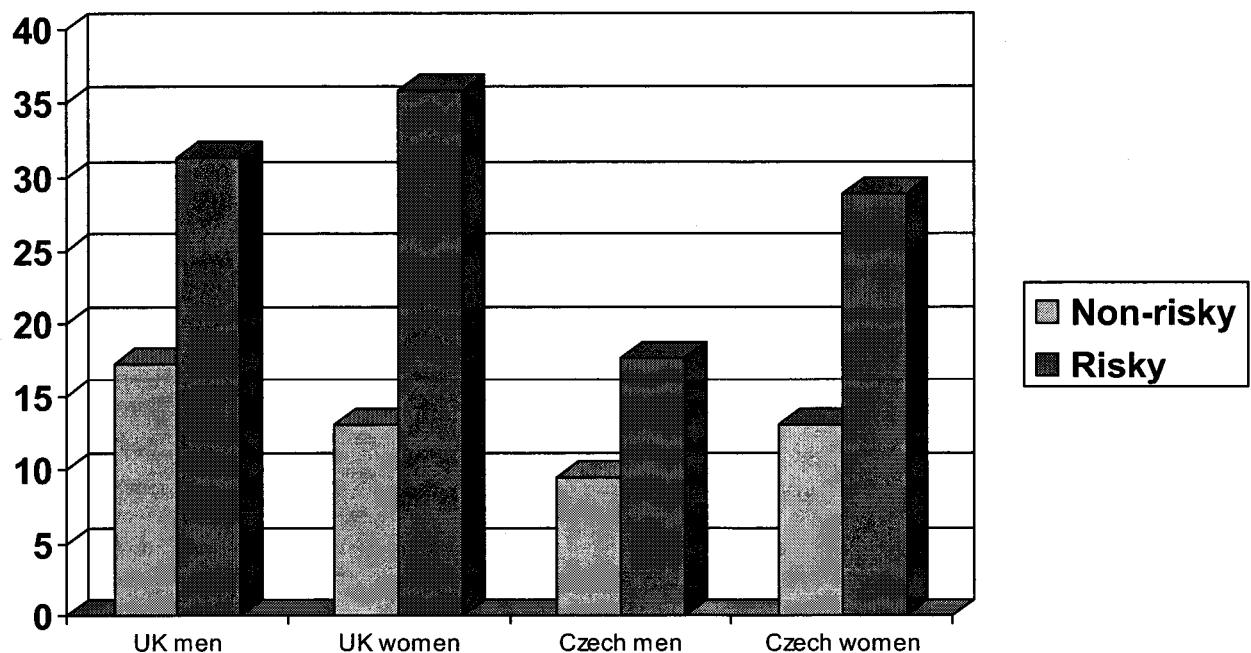


Figure 6. Percent of partners of respondents reporting aggression who were risky drinkers (> 20 g. alcohol daily for women and > 40 g. for men) versus non-risky drinkers

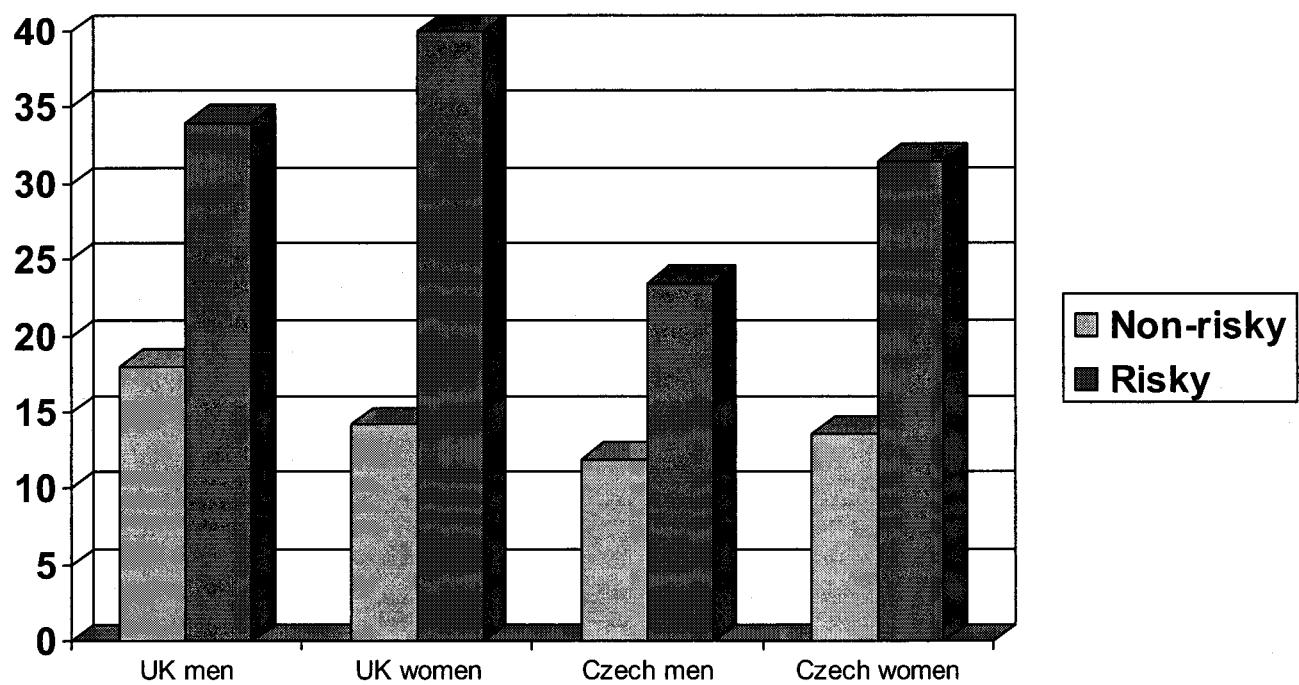


Table 1. Logistic regression, victims of violence, by partner (*Current drinkers only!*)

	Czech Republic				United Kingdom			
	B	S.E.	Sig	exp(B)	B	S.E.	Sig	exp(B)
Age	-0.018	0.006	0.003	0.982	-0.053	0.005	0.000	0.948
Gender	0.369	0.151	0.014	1.446	-0.221	0.139	0.112	0.802
Binge	0.567	0.189	0.003	1.763	Not available for UK			
Risk	0.383	0.187	0.040	1.467	0.774	0.188	0.000	2.168
Partner Risk	0.848	0.172	0.000	2.336	0.944	0.272	0.001	2.570
MODEL:			0.000				0.000	

AGE=ascending

GENDER= 1 =male (ref. cat.), 2=female

BINGE= 0=less than monthly (ref. cat.), 1=at least monthly

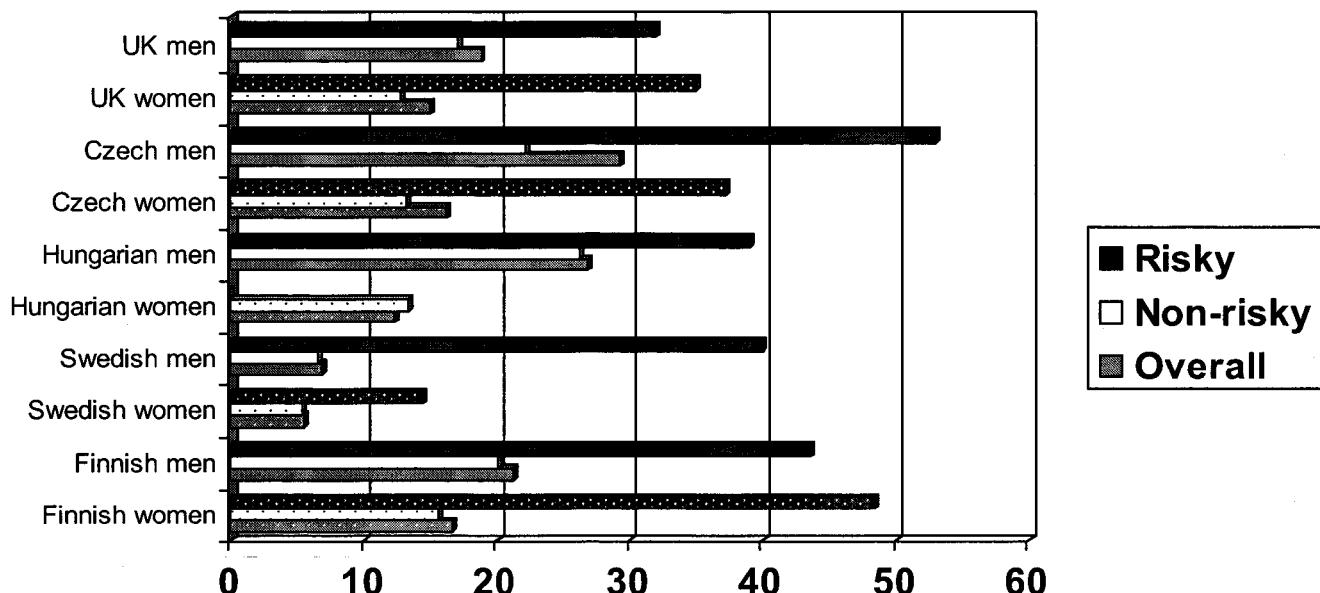
RISK= 0=less than 20g/day for women and less than 40g/day for men (ref. cat.), 1=21g+/day for women and 41g+/day for men

PARTNER RISK= 0=less than 20g/day for women and less than 40g/day for men (ref. cat.), 1=21g+/day for women and 41g+/day for men.

No significant interaction effects

NOTE! Assuming heterosexual partnerships!

Figure 7. Percent of male and female respondents who reported that it was usually true or sometimes true that they become more aggressive toward other people when they drink by whether or not the respondent reported risky level of drinking (>20 g for females and >40 g. for males)

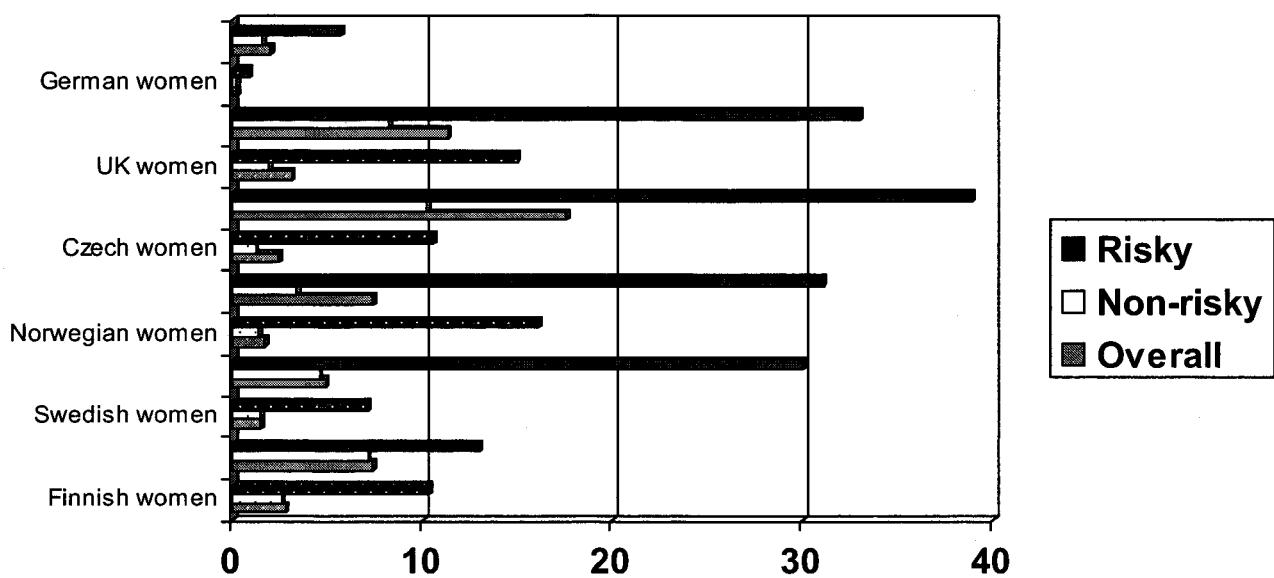


UK: Asked of current and former drinkers.

Hungary: No Hungarian women reported risky drinking.

Sweden: Asked of current drinkers only.

Figure 8. Percent of male and female respondents who reported getting into a fight while drinking by whether they reported risky drinking (>20 g for females and >40 g. for males) (Current drinkers only)



Note: Survey question different in Germany (physical altercation due to alcohol), Finland (caught in a scuffle or fight) and Norway (come to blows or got into a fist fight)

UK: Former drinkers as well as current drinkers were asked this question.

Sweden: Those who consumed alcohol less than once a month or not more than 2 drinks per occasion not asked.

Chapter 6: Social inequalities

Social Inequalities in Alcohol Consumption and Alcohol-related Problems in the Study Countries of the EU concerted action "Gender, Culture and Alcohol Problems: A Multi-national Study"

Kim Bloomfield, Ulrike Grittner, Stephanie Kramer, Gerhard Gmel & Jürgen Eckloff

1 INTRODUCTION

Within epidemiological research social inequalities in health status and mortality have been extensively studied (e.g., Mackenbach et al, 1997; Kunst et al, 1995, 1996; Marmot et al, 1984, 1991). In alcohol research, the role of socio-economic determinants in alcohol use and misuse as well as alcohol-related mortality and morbidity has also been the subject of numerous studies (e.g., van Oers et al, 1999; Mäkelä, 1999; Harrison & Gardiner, 1999; Hemmingson et al 1997; Midanik & Clark, 1994). Although not always referred to as research on "social inequalities," such studies have examined differing prevalences of alcohol consumption and alcohol-related problems by social class in different population groups. It is has been found in North America, for example, that household income, education and employment status are positively associated with current drinking status and more frequent drinking, but are negatively correlated with measures of heavier drinking such as weekly heavy drinking (Midanik & Clark, 1994; Greenfield et al, 2000).

European research has also found an association between socio-economic factors and alcohol use. Van Oers et al (1999) reported that in the Netherlands lower educational status was positively related to abstinence among both men and women, but that very excessive drinking was more prevalent in the lowest educational group of men. Among women educational level was negatively associated with psychological dependence and symptomatic drinking while among men it was negatively associated with social problems. In reviewing census data and hospital discharge records in 13 counties in Sweden Hemmingson et al (1997) reported that compared to men and women in higher positions, those in blue collar positions or lower white-collar positions had an increased likelihood of receiving alcoholism-related diagnoses (alcoholic psychosis, alcoholism, alcohol intoxication) or a diagnosis of liver cirrhosis.

Marmot (1997) examined data from the Whitehall II Study with regard to social inequalities in drinking behaviour and found variations in the prevalence of alcohol consumption by occupational grade. As

with van Oers et al (1999), who examined educational status, Marmot found higher rates of abstention for both sexes among those in the lower occupational grades. Among men in the higher occupational grades more were moderate drinkers, but the proportion of heavier drinkers was nearly constant from highest to lowest grades. Among women, however, there was not only a higher proportion in the higher grades that drank moderately, but also a much higher rate for heavier drinking for this group. For men there was no substantial difference in the proportion of those reporting two or more positive answers to the CAGE screening questionnaire, but among women, a clear positive relationship was evident. In another study, Kunst et al (1996) found differing associations between heavy drinking and educational level among men and women in eight European countries. Heavy drinking episodes (i.e., four glasses or more per day) were more common among men with lower educational levels. Among women, no substantial differences could be found.

Bloomfield et al (2000) investigated social inequalities in drinking behaviour in a sample of the German general population and found in comparison with men of high socio-economic status (SES), men of middle SES had increased odds of heavy episodic drinking (measured as 5+ drinks a day at least once a week) and of a positive score on the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al, 2001) hazardous use measure, while men of lower SES had higher odds for dependence symptoms. Women of middle SES had significantly lower odds for reporting items of the CAGE alcohol screening instrument (Bradley et al, 1998) and DSM-IV alcohol abuse criteria in comparison to women of high SES. Thus, women of lower and higher SES resembled each other in drinking behaviour. For men, no identifiable pattern was found. The lack of clear social inequalities among the consuming German general population could be due to the widespread integration of alcohol drinking in everyday life.

Concerning inequalities in alcohol-related mortality, a Finnish study (Mäkelä, 1999) found that lower socio-economic groups had higher rates of both acute and chronic alcohol-related mortality. However, Harrison & Gardiner (1999) in Great Britain reported that although alcohol-related mortality rates were higher for those in manual occupations compared to those in non-manual occupations, age and sex strongly influenced the degree of this difference. Younger men, aged 25-39, with unskilled manual jobs were 10-20 times more likely to die of an alcohol-related cause than men in the professional classes. But among men aged 55 to 64 years manual labourers experienced a death rate of only 2.5 to 4 times higher than that of professionals. Among women a similar relationship was found only for in younger age groups; among the older groups those in professional positions had a greater likelihood of dying of an alcohol-related cause than those employed in manual labour.

"Gender, Culture and Alcohol Problems: A Multi-national Study" is a European Union concerted action. The consortium includes study partners with representative general population data sets from thirteen EU member or associated states - Austria, Czech Republic, Finland, France, Israel, Italy, the Netherlands, Norway, Sweden, United Kingdom, Switzerland, Germany and Hungary and two non-European countries: Mexico and Brazil. As noted in the introduction, the original study began with a broader spectrum of European and non-European countries which was intended for a better investigation of differences in drinking cultures and the social position of women on a cross-national basis. Due to juridical and logistical complications, several non-European study countries had to

withdraw as formal partners of the project. Thus, the final count of study partners includes a curious but interesting mixture of these 13 European countries and two Latin American countries. The surveys from all these studies had the required data for the present analysis and thus could be included in the present chapter which reports on one of the specific research objectives: that of investigating social inequalities in alcohol use and misuse cross-culturally as well as across the genders.

2 METHODS

2.1 Data

Table 1 describes the samples used in the comparison. The surveys were independently conducted in the different countries, but the data have been centrally archived in a project data bank by the project data centralisation coordinator in Lausanne, Switzerland. The project data centralisation coordinator has also standardised as many variables as possible across the data sets (see Chapter 1 of this report for more information). Most of the data were collected in the late 1990s and early 2000s. Most samples were national, with the exceptions of Netherlands (data from Limburg region) and Italy (data from the Florence/Tuscany region). Survey modes and the sizes of the samples varied between the countries. Response rates in those countries for which the data exist suggest relatively high response rates in general (around 70%); in Germany the response rate remained below 50%.

2.2 Age and gender: survey characteristics

The age ranges of respondents in the study country samples varied. For the present analysis we selected only respondents between 25 and 59 years of age in order to increase comparability and also to focus on those of working age who have completed their education (Table 1).

Table 1. Survey characteristics of EU Project Alcohol & Gender study countries

Country	Year	sampling frame	survey mode	response rate	Age 25-59*		
					cases	men	women
Switzerland	1997	national	telephone	68.4%	8160	3768	4392
Germany	2000	national	postal	51.4%	7001	3203	3798
Italy	2001 / 2002	regional (Florence / Tuscany)	postal + telephone	61.0%	2092	1041	1051
France	1999	national	telephone	71.3%	8725	3904	4821
UK	2000	national	face to face and CAPI	quota	1299	633	666
Israel	2001	national	face to face	<60%	3665	1609	2056
Mexico	1998	national	face to face	no info	3988	1633	2355
Sweden	2002	national	telephone	69.2%	3423	1685	1738
Finland	2000	national	face to face / self admin.	79.4%	1339	681	658
Norway	1999	national	face to face / self admin.	quota	1407	670	737
Netherlands	1999	regional	postal	71.0%	3038	1410	1628
Austria	1993	national	face to face	quota	2282	2313	4595
Czech Republic	2002	national	face to face	72.6%	1861	915	946
Hungary	2001	national	face to face / self admin.	quota	1758	830	928
Brazil	2001	regional (Botucatu, all urban area residents)	face to face	quota	607	265	342

*The sample size was restricted to age 25-59 for better comparability

2.3 Socioeconomic status measured through attained education

Socio-economic stratification is one factor in exposure to disease that has been examined to explain why rates of disease vary by social group (Berkman & Kawachi, 2000). Various terms, reflecting different traditions and conceptualisations have been used in epidemiological literature to describe the social and economic factors influencing health and illness, including social class, social stratification, social inequality, social status and socio-economic status (Lynch & Kaplan, 2000).

Socioeconomic status is typically operationalised using income, education or occupation (Jöckel et al., 1998). In the present study we chose education as the main indicator of SES. Education has a practical advantage over income insofar as in many study countries income information is sensitive and thus can be difficult to obtain in general population surveys. Indeed, in the surveys from the participating study countries, education was the most widely asked indicator of socioeconomic status and had the fewest number of missing responses. Also, compared to other indicators such as occupational prestige, education has been said to more accurately convey what it is about social position that may be causally related to increased risk (Marmot, 1996). Finally, as many women do not have direct access to income and are less likely to be employed than men, education has been proposed as a better measure of women's social status.

2.4 Measuring education

Education is generally measured in one of two ways in comparative analyses: either by years of schooling or by means of a categorization scheme (Bloomfield, 1998). Years of education may appear to be straightforward and easily quantifiable; however, it can be less reliable for international comparisons as countries' educational systems can vary greatly (Braun & Müller, 1997). Moreover, even within the same country, years of education, which measures only one dimension of education, does not necessarily indicate the credentials obtained or reflect the quality of education. And, even where educational levels may be quite accurately ascertained, the *meaning* of various levels may change over time so that within one country educational status may vary by age cohort.

Nearly all questionnaires used in this study asked about level of education attained rather than years of schooling completed. Thus it was possible to apply a standardised classification system based on level of education attained. Perhaps the most widely used classification, and the one we chose to use, is the ISCED-97 (International Standard Classification of Education).

The ISCED, which was originally developed in 1976, was revised most recently in 1997. The ISCED-97 typology has several advantages. First, it offers a standardised classification for the majority of project countries (with the exception of Brazil and Israel). Second, it combines several dimensions: years of education, credentials, and type of education (general vs. vocational). Categories also take into consideration the *content* of the programmes: starting age, entrance qualifications, certificates, and a programme's orientation to specific occupations. Using the ISCED-97 as a starting point, we

worked together with the study leaders from each country to apply the categorisation to their respective samples and create education variables for each country.

The ISCED-97 manual breaks down education into seven main categories: 0 Pre-primary, 1 Primary, 2 Lower secondary, 3 Upper secondary, 4 Post-secondary, 5 First stage tertiary, 6 Second stage tertiary. For our analyses we collapsed these seven categories into three main categories (low, middle and high), defining the categories where possible so that the bulk of the respondents (approx. 40-50%) fell into the middle category.

As our study includes 15 EU and non-EU countries, the distribution of educational levels among respondents in the participating countries varied. In a few study countries the vast majority of the population receives only compulsory education while in others the distribution is such that most respondents received at least some secondary education. Thus, we had to devise a way to apply the three categories to all project countries while taking into consideration the varying distributions within them.

We addressed this by creating two separate sets of countries: each grouping had a low, middle and high category, but for one group of countries the division between the low and middle educational levels was drawn at primary school while for the other it was drawn between lower and upper secondary school (see Table 2).

Table 2. Explanation of categorisation of study countries via ISCED-97 classification

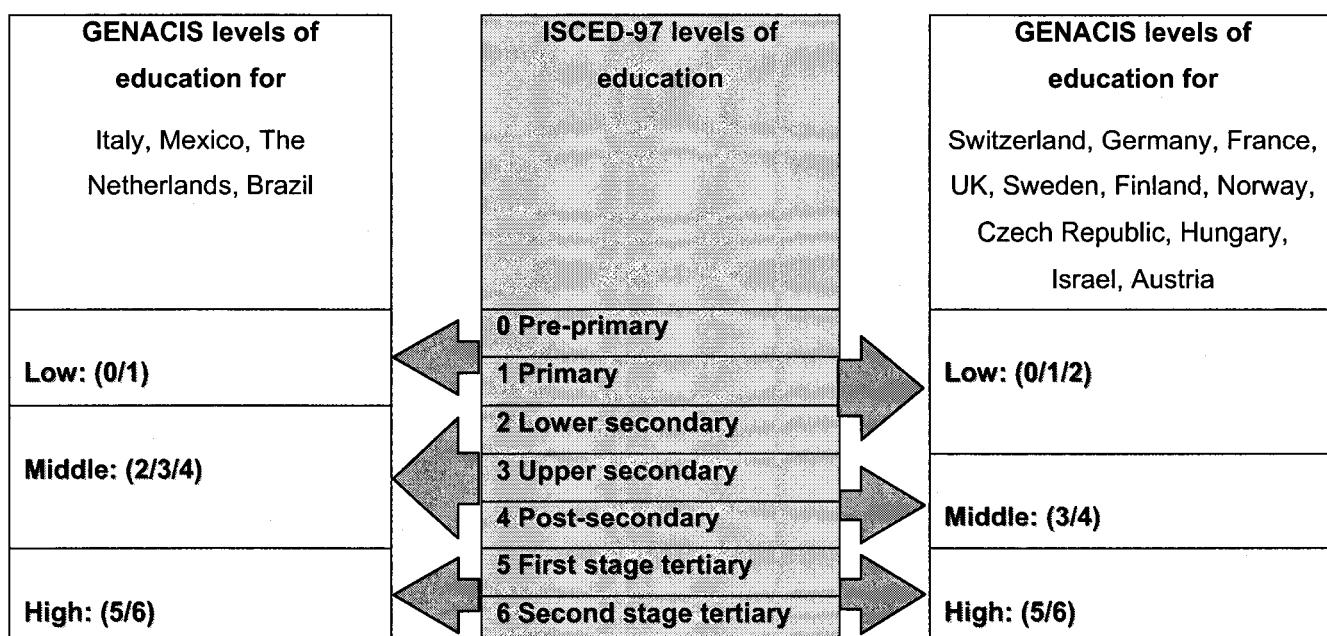


Table 3 shows the frequencies and distributions for all fifteen official EU project study countries. For most of the countries, the middle education category has the highest frequency (range: from 42.5% in Finland to 72% in the Czech Republic). There were three exceptions, however: in Austria, Mexico and Brazil the majority of respondents had attained only the lowest educational level, so that the middle grouping was smaller.

Table 3. Categorisation of education-variable by study country

age:25-59	Low (%)	n (unweighted)	Middle (%)	n (unweighted)	High (%)	n (unweighted)
	Pre/ primary / lower secondary education		upper secondary education		tertiary education	
Switzerland	17.6	1354	61.1	5087	21.3	1719
Germany	6.1	445	56.2	3910	37.6	2594
France	16.8	1398	52.7	4540	28.9	2618
United Kingdom	26.3	342	44.0	572	29.6	385
Israel	18.0	591	57.4	2180	24.6	893
Sweden	12.5	427	54.0	1863	30.9	1040
Finland	22.4	300	42.5	569	35.1	470
Norway	22.5	314	42.7	596	34.8	485
Austria	60.0	2759	36.6	1684	3.3	152
Czech Rep.c	8.4	156	72.0	1339	19.7	366
Hungary	21.3	330	62.6	1071	16.1	356
Italy	14.1	294	71.1	1484	14.8	309
Mexico	45.3	1853	41.0	1583	13.7	552
The Netherlands	11.7	342	71.6	2096	16.7	490
Brazil	57.0	346	31.1*	189	11.9	72

*for Brazil: including the highest grade of the primary level (10.9% of the respondents)

2.5 Alcohol consumption

For the analysis we used as dependent variables the current drinking status, heavy episodic drinking (or binge drinking) and heavy drinking in terms of volume.

Current drinking status: Abstainers are defined as those who had not consumed alcohol in the last 12 months. "Current drinkers" were those who had consumed alcohol at least once during this time.

Heavy episodic drinking: The variable for heavy episodic or binge drinking was also dichotomised. Respondents were divided into two groups: those who had drunk "x" glasses on one occasion more often than once a month and those who had not. The definition of binge drinking varied between countries: 3 or more glasses in Hungary, 5 or more glasses on one occasion in Germany, Israel, Sweden, Brazil, Mexico, 6 or more glasses on one occasion in Finland and the Netherlands, or 8 or

more glasses in Switzerland. For Brazil the binge variable is constructed using the graduated frequency question. The surveys in Norway and the Czech Republic used a beverage-specific binge measure. An overall binge measure was thus calculated using the highest reported number of 5+ drinking occasions for a single beverage. The questionnaires from Italy, France, Austria and the UK did not include a question about heavy episodic drinking.

Because of different drink sizes and differing alcohol content of the beverages, the binge measure represents varying pure alcohol intake. In Hungary, Finland, Israel, the Netherlands, Brazil and Sweden the cut point for binge drinking is approximately 60 grams of ethanol, in Mexico 65 grams, in Germany and Norway at the average 70 grams, in Switzerland 80 grams, and in the Czech Republic 90 grams.

Heavy volume consumption: Heavy consumption was defined as ethanol intake of more than 20 grams per day for women and more than 30 grams per day for men (British Medical Association, 1995) on average. The volume (per day) measure is defined as the summary of beverage-specific volume measures for Switzerland, Germany, Italy, France, Israel, Sweden, Finland, Norway, Austria, Mexico the Czech Republic and Hungary. For Great Britain, the Netherlands, Brazil and a part of the Swedish sample the volume measure is based on an overall and not a beverage specific question. For a part of the Finnish sample (where the beverage-specific volumes are missing) and for Mexico the volume measure is based on the graduated frequency measure (see Chapter 1 for more information on the construction of the drinking measures).

2.6 Consequences

Several of the EU project study countries included the AUDIT or parts of it in their survey questionnaires. The AUDIT was developed and tested internationally through a WHO-supported initiative (Saunders et al, 1993a & b), has proven to be a valid screening tool (e.g., Conigrave et al, 1995) and has been translated into several languages.

Among those study countries, which had included the AUDIT, we chose to examine only those questions that ask about consequences of drinking behaviour. The original AUDIT contains questions on heavy episodic drinking, frequency and amount of alcohol consumption. There is growing concern that the total AUDIT score is dominated by the first three consumption items, and therefore does not measure much more than drinking behaviour such as frequency of drinking in international comparative studies (Gmel, Heeb & Rehm, 2001; Ivis & Rehm, 2000). It was possible only in five of the fifteen project countries (Switzerland, Sweden, Finland, Czech Republic, and Hungary) to look at comparable consequence questions for six items from the AUDIT (although there are actually seven consequence items total, but only three countries had these seven items). Because of differently formulated answer categories we constructed dichotomised variables to categorise people who reported these individual consequences at least once over the last twelve months and people who did not. The actual wording of the questions differed slightly across the study countries. We looked at the

prevalence of having two or more positive answers to the six consequence-items. Those AUDIT items used in our analyses follow:

During the last 12 months have you...

1. ...*at least one time found that you were not able to stop drinking once you had started?*
2. ... *at least one time failed to do what was normally expected from you because of drinking?*
3. ... *at least one time needed a first drink in the morning to get yourself going after a heavy drinking session?*
4. ... *at least one time had a feeling of guilt or remorse after drinking?*
5. ... *at least one time been unable to remember what happened the night before because you had been drinking?*
6. ... *or someone else been injured as a result of your drinking?*

2.7 Statistical analyses

Basic prevalence (e.g. percentages) was calculated for abstention, heavy drinking, and heavy episodic drinking with the respective survey sample as the base (i.e., drinkers and non-drinkers combined). To use the general population as the denominator is an important consideration when investigating social inequalities in drinking behaviour from a Public Health and population health research perspective, as it is well known (and confirmed again here) that there are less current drinkers among those of lower social status. These lower drinking rates can "inflate" rates of heavy drinking and heavy episodic drinking among those in lower socio-economic strata if current drinkers are taken as the denominator for calculating such measures. Only for the drinking-related consequences have we decided to use drinkers only as the population base for calculating problem rates.

Logistic regression was performed to calculate age adjusted odds ratios for abstention, heavy drinking and heavy episodic drinking. The analyses were made separately for men and women and for the different countries. The reference group was the highest educational level and is not shown in the figures.

3 RESULTS

3.1 Abstention

Among women in Brazil, Germany, the Netherlands, Israel, France, Hungary, Italy, the UK and Mexico there were significant inequalities in abstention by educational attainment. In all cases the odds of being an abstainer were the highest in the lowest educational groups. No differences in the likelihood of being an abstainer with regard to educational status were found for Norway, Finland, Austria and

the Czech Republic. There was a statistically significant difference in abstention between only the lowest and highest educational categories in Sweden and Switzerland (Figure 1). A table with the basic prevalence for all measures and countries is provided for reference in Appendix D.

Figure 1. Odds ratios for abstention by educational level, women

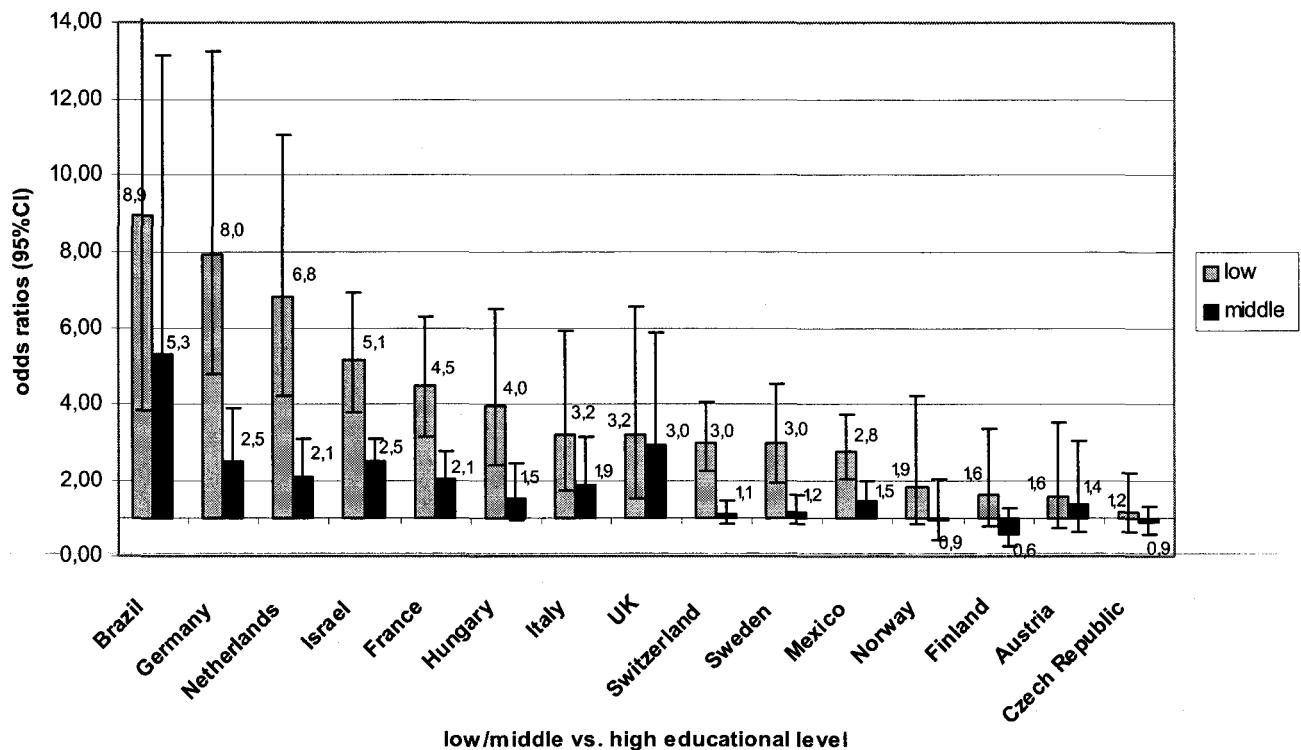
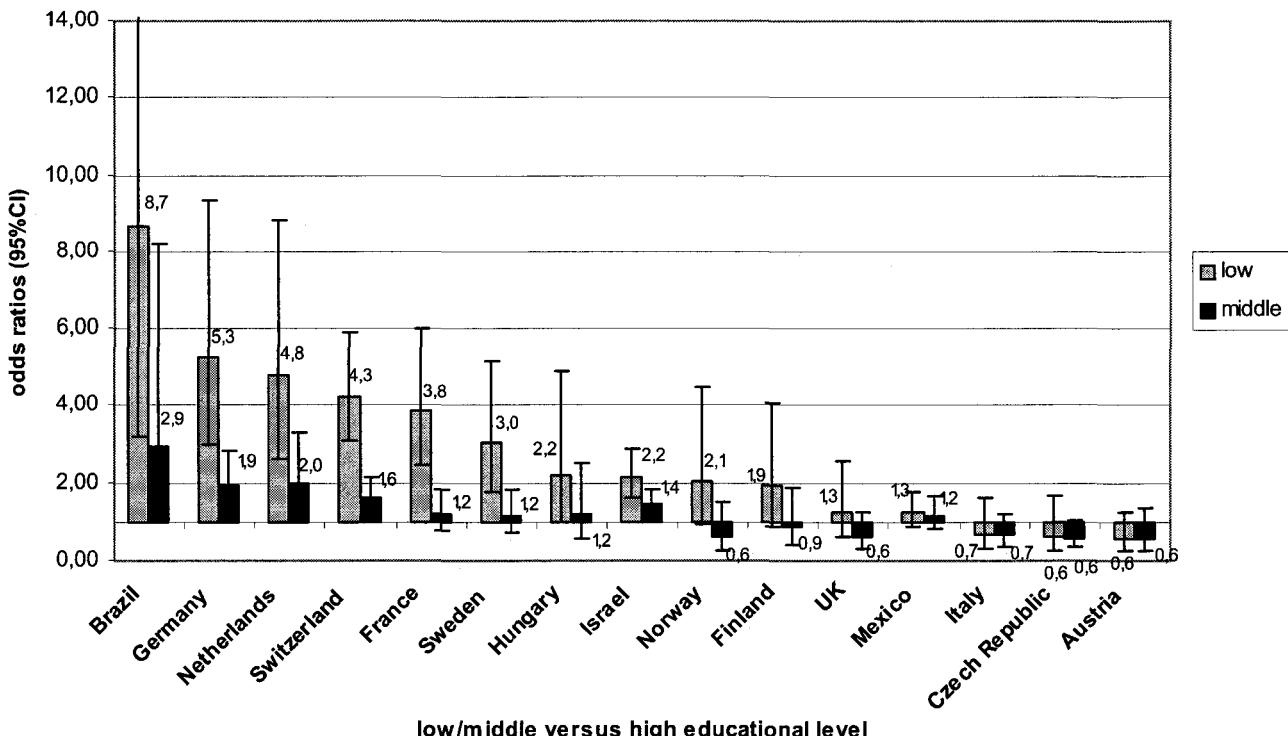


Figure 2. Odds ratios for abstention by educational level, men

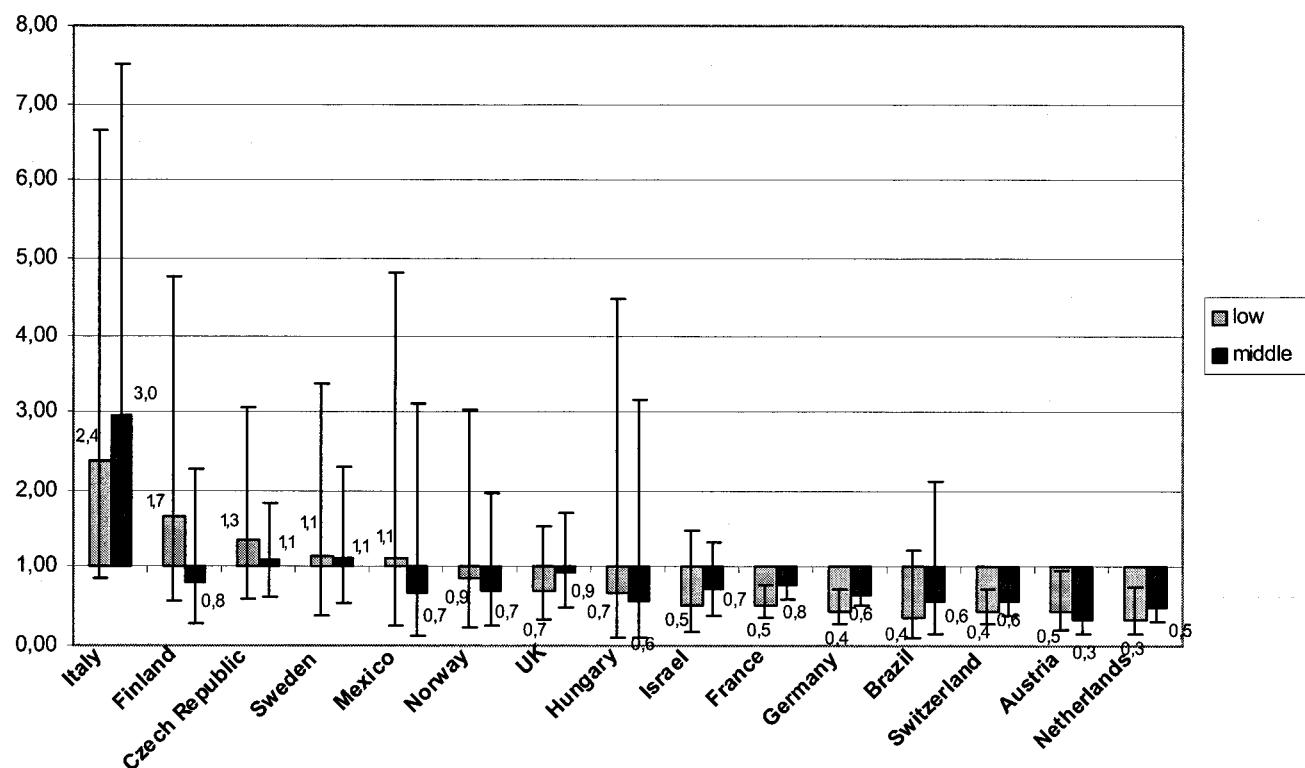


For men, significant inequalities in the likelihood of abstention were found across all three educational categories in four countries: Brazil, Germany, the Netherlands and Switzerland (Figure 2). In these cases a negative gradient was again evident with the lowest educational group most likely to be abstainers. For France, Sweden, Hungary and Israel there were differences in abstinence only between the lowest and highest educational groups, and for the remaining countries no significant differences were found.

3.2 Heavy Drinking

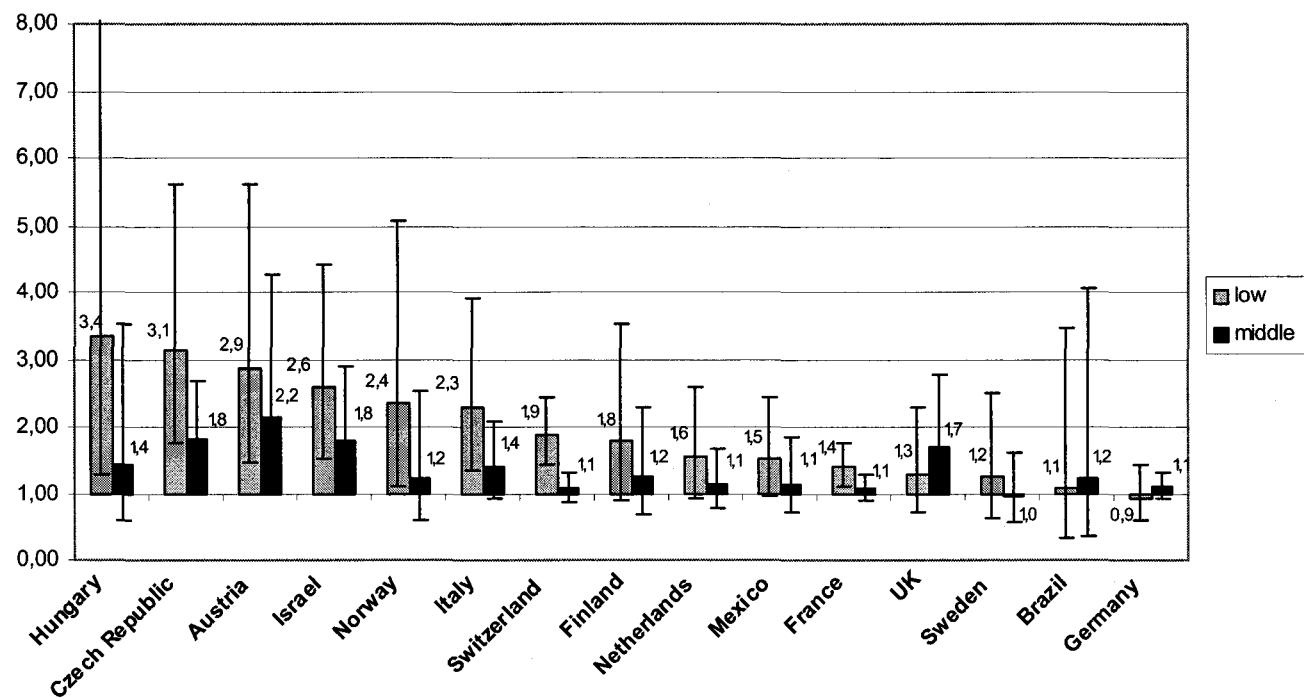
With respect to heavy consumption the drinking gradient reverses itself among women in Austria, the Netherlands, Germany and Switzerland, where women of higher educational status are more likely to consume heavily as compared to women of middle or lower educational attainment respectively (Figure 3). For the remaining countries, the differences are insignificant except for the curious exception among Italian women where those of middle educational attainment are more likely to be heavy drinkers than those of high educational status. The very large confidence bands around the values for many countries reflect the small numbers of heavy drinkers in general among women.

Figure 3. Odds ratios for heavy drinking by educational level, women



The results with regard to heavy drinking among men are quite different. For several countries, the prevailing pattern is that those of lower educational attainment are more likely to be heavy drinkers than those of higher educational attainment (Figure 4). This pattern was significant for Hungary, the Czech Republic, Austria, Norway, Italy and Switzerland. Also in the Czech Republic, Austria, Israel and the UK men of middle educational attainment were more likely to be heavy drinkers than men of higher attainment. For the other study countries educational status had no affect on the likelihood of heavy consumption.

Figure 4. Odds ratios for heavy drinking by educational level, men



3.3 Heavy Episodic Drinking

Except for the case of those of middle educational standing having a greater likelihood of being HED drinkers than those of higher education in the Netherlands, no significant social inequalities in binge drinking were evident for women (Figure 5). For men the results are quite mixed. There is a gradient evident in the Czech Republic, Hungary, and Germany with the lower and middle educational groups respectively being more likely to be heavy episodic drinkers than the higher educated (Figure 6). In Israel, Mexico men of middle educational status have greater odds than men of lower educational status to be HED drinkers compared to men of high educational status. And in Sweden it appears that only men of middle educational status are slightly more likely to be binge drinkers compared to higher educated men.

Figure 5. Odds ratios for heavy episodic drinking (HED) by educational level, women

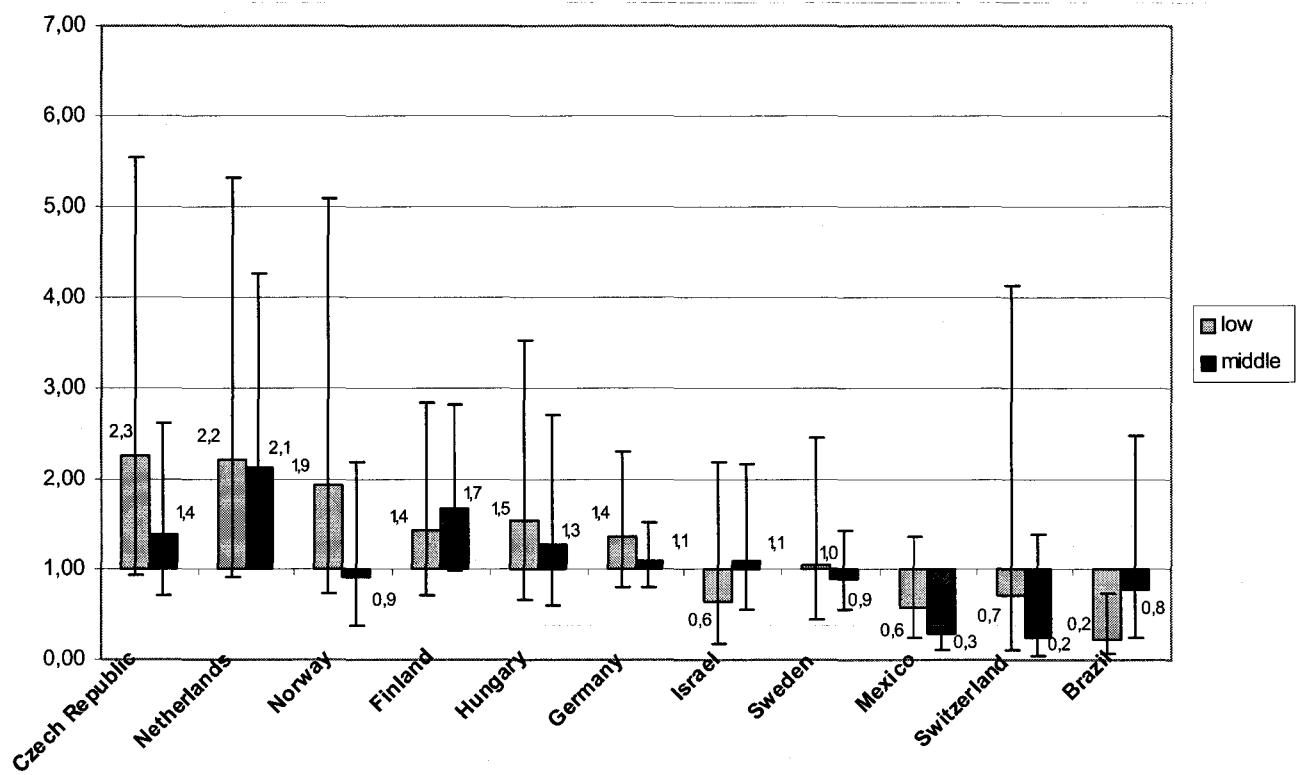
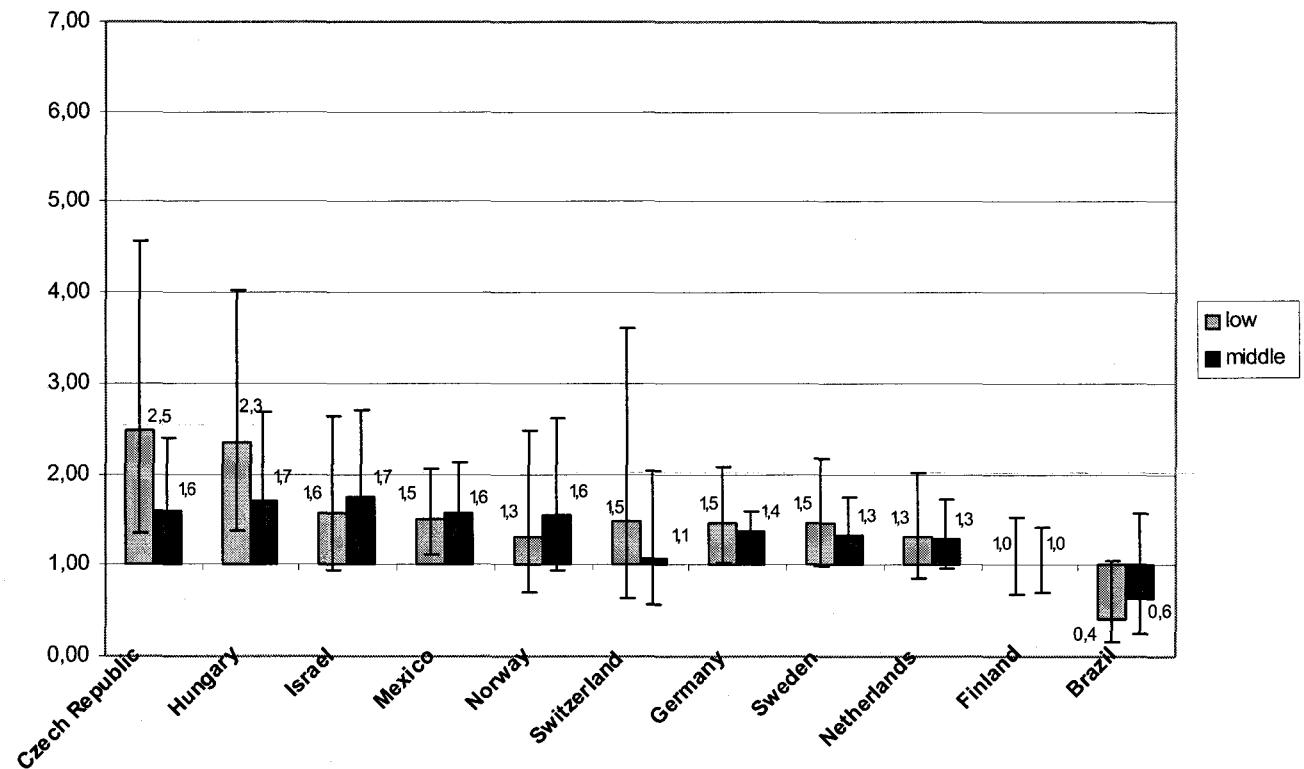


Figure 6. Odds ratios for heavy episodic drinking (HED) by educational level, men



3.4 Alcohol-related problems, AUDIT items

Social inequalities with regard to alcohol-related problems as measured by the AUDIT do not appear to exist in a statistically significant sense among women in the five examined EU project countries (Figure 7). Only among Finnish women of middle educational status was there a significantly increased risk of reporting two or more problems in comparison to women of high education. However, although statistically insignificant there still is an observable trend of women of low SES being more likely to report two or more AUDIT problems than women of high SES. Quite a clear pattern exists for men with lower education having a higher likelihood of reporting problems than men of high education, although this trend is not significant for all countries; i.e., only in Finland, the Czech Republic and Hungary (Figure 8).

Figure 7. Odds ratios for 2+ out of 6 AUDIT problem items by educational level, women (drinkers only)

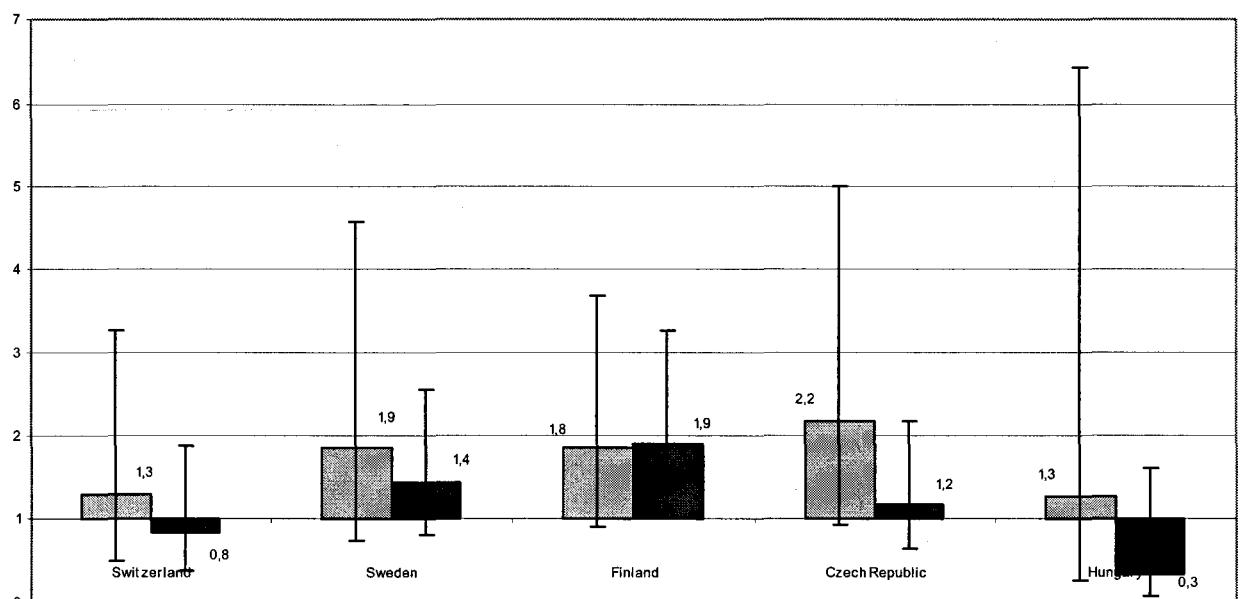
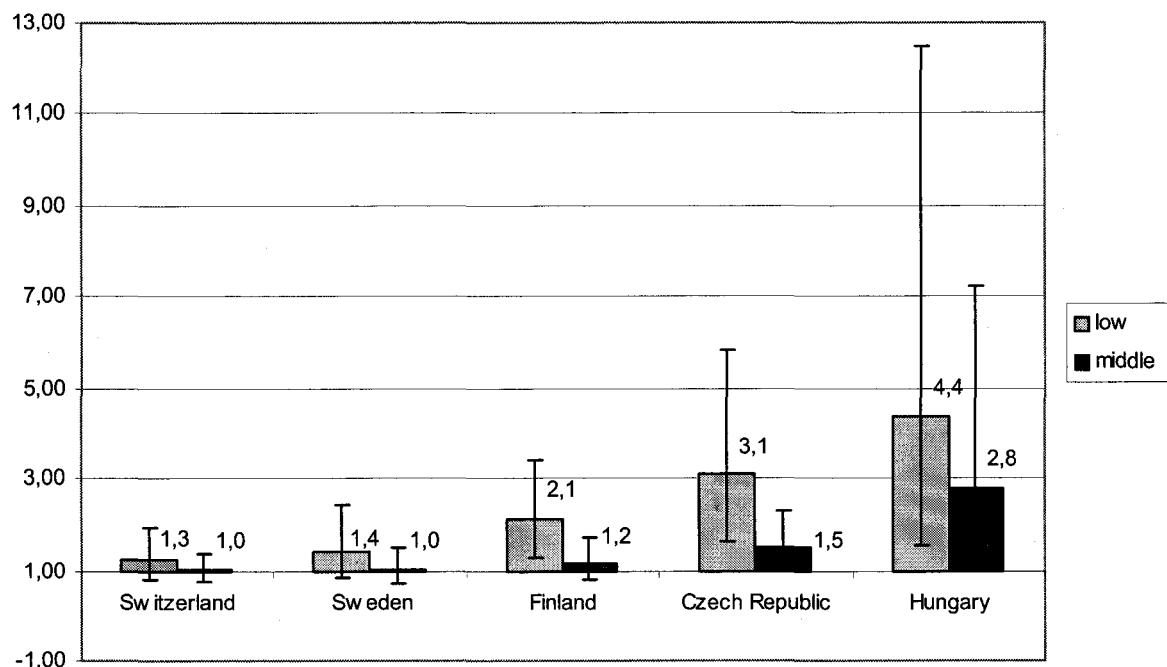


Figure 8. Odds ratios for 2+ out of 6 AUDIT problem items by educational level, men (drinkers only)



4 DISCUSSION

This paper has examined social inequalities in drinking behaviour in the 13 European and two non-European countries of the EU concerted action "Gender, Culture and Alcohol Problems: A Multi-national Study. An extensive exercise was undertaken to categorise the educational standing of respondents in each of these countries, as well as to standardise the drinking measures that were employed.

Abstention was the drinking measure that showed the most similarity between the genders; that is, the patterning of social inequalities for men in the study countries was similar to the patterning for women. For the countries Brazil, Germany, the Netherlands, France, Israel, Hungary, Sweden and Switzerland, social inequalities in the likelihood of abstinence are basically similar for both men and women, with those of lower education being more likely to abstain. For Austria, the Czech Republic, Norway and Finland no significant inequalities in the likelihood of abstinence for both men and women are evident. Thus, with regard to abstinence, men and women of the countries mentioned tend to behave similarly within a country. The countries that demonstrated "discordant pairs," as it were, are Italy, Mexico and the UK where there were no significant differences among men, but indeed among women. There are no study countries in which there are inequalities among men but not among women.

With regard to heavy drinking, the genders show little agreement in their behaviours. The only significant findings are among countries in which the inequalities in heavy drinking are such that women of high education are the most likely to drink more heavily. This is true for France, Germany, Switzerland, Austria and the Netherlands. Otherwise there are no inequalities evident except for Italy

where women of middle education are more likely to be heavy drinkers than women of high education. In contrast, the only significant findings with regard to heavy drinking among men are found in those countries where the pattern is the opposite: men with lower education are more likely to be heavy drinkers. This is true for Hungary, Czech Republic, Austria, Israel, Norway; Italy, Switzerland and France. Among some of these countries a gradient exists in which men of middle education also are at more risk than those of high education to be heavy drinkers but at less risk than men of low education. Generally, though not significantly so for all countries, the odds ratios for low and middle SES were all greater than 1, with the exception of Germany.

For heavy episodic drinking there is also little similarity between the genders. There appears a trend (though insignificant) of a negative social gradient among women, except in the one instance in which Dutch women of middle education have a significant tendency to heavy episodic drinking than women of high education. For men, there is more evidence of social differences. In the Czech Republic, Hungary, Israel, Mexico, Germany and Sweden there is significant evidence of a higher likelihood that either men of lower education or men of middle education or both to be binge drinkers than men of higher education. In Norway, Switzerland, the Netherlands, Finland and Brazil no significant social gradient was evident. Moreover, though not significantly so for all countries, odds ratios were equal or above 1 for men of low and middle SES except in Mexico.

Finally, for those five countries with comparable items from the AUDIT test, little in the way of social differences in reporting could be found among women. Only for Finnish women of middle education was the likelihood greater to report alcohol-related problems than higher educated Finnish women. But inequalities were more evident again among men with lower educated men in Finland, the Czech Republic and Hungary reporting more problems than higher educated men. This is also true to a lesser degree for men of middle education in the Czech Republic and Hungary. As a more general tendency, odds increased across countries in about the same way for men and women (Switzerland lowest, CZ highest), with the exception of Hungary, and low SES groups of both sexes had odds ratios greater 1 in all countries, though not significantly so in most countries.

In sum, with regard to the social distribution of current drinking status, men and women tend to be similar. Thus, in general the same social patterning exists for drinking status for both men and women within a given country. For heavy drinking, the genders diverge and in several countries higher educated women are those most likely to drink heavily while among men, there are several countries in which the lower educated are more at risk. And within most of those countries in which the higher educated women were more at risk, lower educated men were more at risk for heavy drinking (although the findings were often not significant). For heavy episodic drinking, no real social differences were evident among women in the study countries, but in several countries a social gradient was observable for lower educated men who were more at risk for heavy episodic drinking than higher educated men. This same patterning was also found for reported alcohol-related problems for five of the study countries.

Thus, drinking per se appears to be a shared endeavour between the sexes and across countries, but the experience of heavy or problematic drinking - as reflected in the drinking measures we examined -

differs. In many countries higher educated women tend to be heavier drinkers, but there appears to be not much difference by education in reporting problems or in binge drinking, while in several countries lower educated men tend to be the heavier drinkers, tend to binge more and report more alcohol-related problems. No clear patterning or groupings of countries emerged from our present analysis. Future, more elaborate or specific analyses should be undertaken (e.g., hierarchical linear modelling, cluster analyses, and further analyses controlling for drinking status) to investigate the possible existence of patterns and trends among the various countries.

4.1 Limitations

The present analysis obviously has several methodological limitations. These are inherent for such a comparative study. As well as coming from various countries in various years, the survey data were collected by varying methods and with varying response rates. Also the original questions for measuring drinking behaviour varied although in most countries the format was often the quantity-frequency measure. However, care was taken to make the drinking summary measures as comparable as possible, and care was taken to also develop a relatively valid yet comparable scheme for comparing educational status. These limitations can introduce a certain amount of imprecision into our analyses. Yet it is hoped that when the data tend to produce similar results across countries, this can serve to help confirm some main results. For example, the very obvious inequality in drinking status across many countries as well as across gender could help bolster the conclusion that those of lower educational status are more likely to be abstainers than the higher educated. With this particular observation, the results of previous studies also lend support that such a result is most likely valid.

4.2 What do social inequalities mean for drinking behaviour?

The question could be raised as to what do social inequalities in drinking behaviour signify. In epidemiological and Public Health research the tradition is to examine inequalities in health or health status. When we look at alcohol consumption we are combining elements of lifestyle along with indicators of health and health risk factors. Thus, social inequalities in abstinence or current drinking status do not necessarily indicate differences in health status, but perhaps lifestyle choices or they could simply be correlates of social status. When we look at heavy drinking or heavy episodic drinking, we are then exploring social inequalities in health risk behaviour. This is more relevant, then, for Public Health research and can give us information as to who is more at risk for certain possible diseases or problems. When we examine inequalities in reporting alcohol-related problems, we are coming the closest to studying inequalities in actual health status, since the problems (if consisting of a full screening schedule) can serve as indicators of alcohol dependence or abuse. However, this is a more problematic area than when studying "clear cut" diseases. Since alcohol and drug abuse can carry stigma (Conrad and Schneider, 1980; Room, 2004), and because the lower classes may be more susceptible to deviant labelling (Conrad and Schneider, 1980), the results we find must be considered within this context, and that a certain amount of underreporting may be taking place with regard to alcohol-related problems. Thus, social status is not only a determinant of health or disease, but it also

affects how we collect and analyse our data in this field. We must always keep such facts in mind when addressing social inequalities and the effect of social status on alcohol use and misuse.

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Chapter 7: Social roles

How do social roles and social stratification influence women's and men's alcohol consumption? A cross-cultural analysis

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1 INTRODUCTION

Inequality in health and particularly gender inequalities in health has been a subject of growing interest in research. Until the 1980s research focused mostly on inequalities in men's health especially related to socio-economic conditions (Townsend, Davidson & Whitehead, 1982, Townsend, Davidson & Whitehead, 1992). Since then research on inequalities in women's health has been increasing. This research has predominantly focused on role models related to marital and parental roles and the effect of being additionally employed or not (Nathanson, 1980, Verbrugge, 1983, Thoits, 1983, Arber, 1991). More recently, there is a shift in research stressing the importance of including both the structural and material situation of women in societies and their family roles (Bartley, Popay & Plewis, 1992, Macran *et al.*, 1994, Arber & Cooper, 2000). Nevertheless, the literature tends to focus on the attachment of health inequalities to work factors, social stratification and social class for men, whereas women's health inequalities have often been analysed within the framework of household and family roles (Matthews & Power, 2002, Lahelma *et al.*, 2002, Arber & Khlat, 2002). The present paper attempts to analyze potential inequalities in one of the major risk factors for health, namely alcohol consumption (World Health Organization (WHO), 2002), by combining both a social stratification and social role framework. The study extends most work in the field by not focusing on a single gender, but looking instead at both men and women simultaneously in a joint analytical framework.

Research could not show that the same roles or roles combinations have consistent positive or negative effects on health. Mainly two different strands predominate. First, the role attachment or role accumulation theory focuses on the beneficial health effects of holding multiple roles, such the roles of partner, parent and employee (Aneshensel, Frerichs & Clark, 1981, Hong & Seltzer, 1995, Hibbard & Pope, 1991). Second, the role overload or role strain hypothesis states that heavy responsibilities for domestic duties and childrearing in addition to work demands may lead to stress, and positive effects of e.g. employment may be mitigated by role overload (Ross & Mirowsky, 1992, Doyal, 1995, Macran, Clarke & Joshi, 1996). Being a single mother seems to be particularly disadvantageous (Whitehead,

Burstrom & Diderichsen, 2000, Hibbard & Pope, 1987). Single motherhood may result in overload due to the responsibilities of childrearing and the potential need to provide the entire family income. For women with children social welfare systems are particularly important. Services like day care or after school care and the extent of maternity benefits are important. Arber and Khlat (2002) stated that in the United Kingdom single mothers often rely on state benefits and therefore live close to the poverty level, whereas in other countries like Finland with good welfare services for women, highly developed child caring services mean that women are not prevented from working outside the home (Lahelma *et al.*, 2002). Thus, the effect of different role combinations may vary across different societies based on their social welfare systems and levels of gender equity. Both are closely linked, and research has to integrate both macro-level and micro-level aspects simultaneously to study the impact of socio-economic and role variables on inequalities in men's and women's health (Moss, 2002). The present paper attempts to interpret both aspects with regard to abstinence, heavy drinking, and risky single occasion drinking (RSOD) for both genders in 10 European countries.

Numerous studies on the relation between social roles and alcohol consumption have been based on the "tension reduction" hypothesis (Cappell & Greeley, 1987). Being involved in several roles may result in stress and alcohol intake as a depressant may reduce this tension. Drinking to cope is part of the alcohol regulation theory which assumes that individuals drink for psychological relief of negative emotions (e.g. McCreary & Sadava, 1998, Peirce *et al.*, 1994). However drinking for coping purposes is more prevalent among men than women (Timmer, Veroff & Colten, 1985).

There is a long tradition in the alcohol field of studying the influences of socio-economic determinants on alcohol consumption (e.g. Midanik & Clark, 1994, Mäkelä, 1999, van Oers *et al.*, 1999). Comprehensive studies on the relationship of social roles and drinking behaviors were published by Knibbe and colleagues (1987) and Wilsnack and Cheloha (1987). Both studies are based on the "classical role theory" (Gerhardt, 1971). Central to this theory is the assumption that individuals with fewer roles have a higher probability of being heavy drinkers than individuals with more roles. Possessing more roles seems to be associated with a certain amount of structuring in one's life resulting in fewer possibilities to drink heavily. The study by Knibbe *et al.* (1987) indicated that the protective effect of role accumulation for alcohol consumption may hold only for men. Wilsnack and Cheloha (1987) could not find a common pattern for the association between roles and alcohol consumption among women. They identified an age-related role deprivation associated with heavy drinking. Younger women, unmarried and without a stable work situation, had a higher probability of heavy drinking. Also, women aged 35 to 49 were more likely to report heavy drinking, if they had lost roles e.g. by divorce. Women in the age range of 50 to 64 were more likely to drink heavily if they stayed at home, had a drinking partner, or were not working outside their homes. Similarly, Gmel *et al.* (2000) showed for women in four European countries that roles and role combinations influenced heavy drinking differently in each country. Their findings also indicated that differences in social position of women in a country were strongly related to differing associations between specific role combinations and heavy drinking and gender equality across countries. Cross-culturally, no single role hypothesis was valid.

The present study investigates the following research questions in relation to abstinence, heavy drinking, and risky single occasion drinking:

- (a) Is social stratification more important for men's drinking, whereas family roles are more important for women's drinking?

- (b) Does the same multiple role hypotheses apply to men and women?
- (c) Are there country differences with regard to the impact of social stratification and multiple roles on alcohol consumption?
- (d) Can these differences be explained by structural variables at the aggregate level, such as gender equity? In addition, the proposed analysis will test whether gender differences can be explained by differential vulnerability (e.g., an interaction effect between employment status and gender).

2 METHODS

2.1 Samples

Data come from the GENACIS study. Organisationally, each participating country provided datasets that were collected and stored in a common databank in Lausanne. Variables used in the present study, such as drinking measures, were constructed in the same way in all countries to permit a central, joint analysis of different datasets. Currently, 31 datasets are available and 10 European countries had sufficient information on both drinking measures and social roles. The present study analyses survey data from Austria, Czech Republic, France, Finland, Germany, Hungary, Norway, Sweden, Switzerland, and UK (Table 1). All surveys were nationally representative.

The age range was restricted to 25-49 years, mainly for two reasons. First, comparable measures for formal education could only be constructed for the highest level of education attained. However, at younger ages, this rarely represents final educational attainment. Second, the presence of children in the household and the corresponding ages of children may have different impact at older ages. However, there was no comparable information on ages of children. Depending on age, there can be a higher likelihood that having children in the household means a substantial effort of respondents for childrearing responsibilities.

Table 1. Survey characteristics of participating countries, unweighted n, age: 25-49

	sampling frame	survey mode	survey year	n	men	women
Austria	national	face-to-face	1993	3.580	1.783	1.797
Czech Republic	national	face-to-face	2002	1.428	706	722
Finland	national	face-to-face (AUDIT+drugs: self-administration)	2000	927	481	446
France	national	telephone	1999	6.765	3.043	3.722
Germany	national	postal	2000	5.092	2.242	2.850
Hungary	national	face-to-face (alcohol questions: self-administered)	2001	1.216	585	631
Norway	national	face-to-face (with self-administration)	1999	1.102	522	580
Sweden	national	telephone	2002	2.411	1.183	1.228
Switzerland	national	telephone	1997	6.349	2.974	3.375
UK	national	face-to-face and CAPI	2000	976	473	503

2.2 Measures of drinking variables

Drinking Status: with the exception of Austria abstainers were defined as non-consumers of alcoholic beverages during the past 12 months. Austria used a three-month reference period.

Heavy Drinking: Heavy drinking was defined as drinking more than 20 (30) grams a day of pure ethanol on average for women (men). These cutoffs reflect a compromise between commonly used thresholds in the literature (Edwards *et al.*, 1994, Bondy *et al.*, 1999, World Health Organization (WHO), 2000, British Medical Association, 1995) and the need to have a sufficiently large number of individuals across all countries. Ethanol measures were derived from beverage-specific quantity-frequency measures for the past 12 months for most countries. Exceptions were A) France, where usual quantity was derived from "yesterday" and "past Saturday" consumption and the highest beverage-specific drinking frequency in the past 7 days; B) UK and Austria, where overall consumption across beverages in the past 7 days was used; C) Hungary, where beverage-specific quantities on the last drinking occasion were multiplied by overall frequency in the past 12 months.

Risky Single Occasion Drinking (RSOD): A measure of RSOD does not exist for Austria, France, or the UK. For the remaining countries, it was based on questions of drinking a certain amount at least once in the past 12 months. Corresponding measures were 8 or more glasses (8+ glasses, approximately 80 grams pure ethanol) in Switzerland, 6+ glasses in Sweden (Finland) with 72 grams (resp. 60 grams), and 5+ glasses in Germany (about 70 grams), Czech Republic (90 grams). In Hungary the question was asked as 3 or more drinks with an approximate drink size of 20 grams per drink.

2.3 Measures of roles

Family Situation: This variable combined marital status with having children. The questions from marital status differed in the countries, and usually differentiated between married, single, divorced, or widowed. In some countries a difference was made between not being married but living in a common-law partnership or married, but separated individuals. The former was combined with married, the latter with divorced. In 8 countries having children under the age of 18 was used. In Hungary only information on having children in the household could be obtained. In Germany the survey only asked about having children or not. Given the restricted age range used in the present study this should generally mean children under the age of 18 and children living in the household. Both variables were combined in a single variable measuring couples (married and cohabitating) with children, couples without children, lone parents, and singles without children.

Formal education: All questionnaires used in this study asked about level of education attained rather than years of schooling completed. The ISCED-97 (International Standard Classification of Education) was used to derive comparable educational groups across countries. The ISCED, which was originally developed in 1976, was revised most recently in 1997. The ISCED-97 typology has several advantages. First, it offers a standardized classification for the majority of project countries (with the exception of Brazil and Israel). Second, it combines several dimensions: years of education, credentials, and type of education (general vs. vocational). Categories also take into consideration the content of the programs: starting age, entrance qualifications, certificates, and a program's orientation

to specific occupations. Using the ISCED-97 as a starting point, in cooperation with the study leaders from each country a categorization of formal education for each country was developed that allowed the creation of a variable for education that was comparable across countries. The ISCED-97 manual breaks down education into seven main categories: 0 Pre-primary, 1 Primary, 2 Lower secondary, 3 Upper secondary, 4 Post-secondary, 5 First stage tertiary, 6 Second stage tertiary. For the present analyses these seven categories were collapsed into three main categories (low, middle and high), defining the categories where possible so that the bulk of the respondents (approx. 40-50%) fell into the middle category.

Employment: Questions on employment again varied widely across countries, sometimes including part-time work or self-employment. The only possibility to achieve a similar measure across all countries was to dichotomize the country-specific questions in employment (working for pay) and unemployment (including apprentices or students).

Control variables: As control variables age in years and household income were used. Household income instead of individual income was used primarily because it was the only variable available for all countries. Answer formats varied across countries with either an open question format or with ordered answer categories, varying between 9 and 12 answer categories. Some countries asked for gross income (before subtracting taxes and other deductions), some for net income. To enhance comparability, household incomes for all countries were recoded into 5 categories approximating 20 percentiles of the distribution within each country.

Aggregate level variables: Several variables that may be indicative for countries' social system, welfare orientation and gender equity were used from the World Bank database (<http://devdata.worldbank.org/genderstats/query/default.htm>). The following variables were used:

- (a) expected years of schooling for women, and the difference between men's and women's expected years of schooling as a measure of educational differences;
- (b) the gross national product (GNP) as a measure of prosperity
- (c) 1) female unemployment rate, and its difference to the male rate; 2) women's activity rate, and its difference to the male rate; 3) the percentage of females' participation in total labor force as potential indications for the impact of a country's employment situation, job security and the corresponding gender equity as regards work roles
- (d) birth rate, fertility rate, and the official number of weeks of maternal leave as an aspect of social welfare and as an indication of the potential impact of being mother in a country.

In addition, a scale published by Siaroff (1994) to measure female work desirability was used. It was constructed as a weighted average of gender ratios for unemployment, wages, and proportions in "elite" positions. Siaroff's analysis was based on OECD countries only and thus did not include Hungary and Czech Republic.

2.4 Statistical analyses

Statistical analyses proceeded in two phases. First, logistic regressions were performed separately for each gender and each country. Logistic regressions were calculated hierarchically. The control variables, age and income, were entered first, followed by social stratification variables, education and employment, and the family situation in four groups was entered last.

Explained variance was measured by Nagelkerke's R^2 , which has similar interpretation to that of R^2 in multiple regression models.

The changes in the Nagelkerke's R^2 depend on the order in which the variables are included in the analysis. By entering social stratification first, the R^2 of these variables would obtain a higher Nagelkerke's R^2 . Nevertheless, the R^2 changes will be used for the estimation of gender differences and in this context the order of inclusion of variables is not of relevance.

Because the variables in each block contained more than one degree of freedom, significance was tested as a block by likelihood ratio tests (Hosmer & Lemeshow, 2000). In a few countries cell sizes of certain role combinations were too small, resulting in co-linearity problems in regression models. In these cases a new variable was constructed contrasting singles against couples, thus independent of whether couples or singles had children.

To test differential vulnerability, logistic regression models were run for each country combining both genders. Differential vulnerability is indicated when the interaction of gender and other exposure variables is significant. With men being the reference group, a positive interaction coefficient indicated that women were relatively more vulnerable compared with men. Interactions were separately tested for education, employment and family situation.

Description and discussion of findings was not based on significance only. Significance depends heavily on sample size. Following the suggestions of Rothman (2002), the importance or strength of findings does not depend on significance only, but also on consistency across different studies (here different countries). We used the following heuristics to describe and interpret findings across countries in addition to significances. We looked at regression coefficients with the same sign across surveys. Thus, a finding was of importance, if, for example, employment was positively associated with drinking across (almost) all countries, independent of whether this was significant in all countries. We also used a rule of thumb for the strength of associations. For example, an odds ratio of 2 (e.g. a regression coefficient of 0.7 or -0.7 for odds below 1) has been assumed to be of sufficient strength (Kromhout, 1998). Similarly, we assumed regression coefficients of ± 0.4 to be indicative for potential associations (with 0.4 corresponding to an odds ratio of about 1.5).

In the second analysis phase the regression coefficients of the first set of logistic regressions (separately for men and women) were used to scale countries according to their patterns of impact of control, social stratification and family situation variables. Optimal scaling was used. Optimal scaling is comparable to principal component analysis (PCA), but has fewer restrictions on the scale level of variables. Given that regression coefficients and variations in regression coefficients also depended on sample size or differences in measures used across countries, these coefficients were conservatively assumed to indicate ordinal information than having an interval scale level. The interpretation of optimal scaling is similar to PCA, with component loadings indicating the strength of variables for the scale, and Eigenvalues (explained variance) to determine the number of dimensions needed. Object scores (comparable to factor scores) can be used as the final scale or scales

(depending on the dimensionality that was needed) of countries. Scales were derived separately for men and women, and for chronic heavy drinking and RSOD. It is important to note that the scale is not indicative of which country had the highest rates of heavy drinking or RSOD, but scales countries according to similar patterns of variables that influenced heavy drinking and RSOD relatively in each country. Thus, two countries would have similar scale values if, for example, the odds ratios of RSOD were increased in a similar way with regard to income, age, education, employment, and family situation. The analysis thus did not focus on similar rates of RSOD, but on similar risk factors for RSOD.

Optimal scaling was also used for the World Bank indicators to derive an indicator of countries' work-welfare-equity-index. Finally, the scales for RSOD and heavy drinking, separately for men and women, were correlated with Siaroff's work desirability index and the World Bank's welfare/gender-equity index. High correlations would thus be indicative for an association between country specific risk factors and the macro-level social system/welfare/equity status.

3 RESULTS

Table 2 includes the gender-specific prevalence of the individual data and the variables of the aggregate level of the World Bank database.

The results regarding employment status showed that in all countries the employment rates for men are higher than for women. Among men the prevalence of being a current drinker is in all 10 countries around 90% of the sample in the given age range. The variation of drinking status was a bit greater for women with the lowest female drinker prevalence in Hungary (78.0%) and the highest in Norway (95.7%). Risky single occasion drinking (at least once a year) was more common among Nordic countries for both genders, whereas heavy drinking (regular consumption of at least 20 (men 30) grams) was more common in central (Germany, France; Austria) or eastern European (Czech Republic) countries both among men and women. As regards the family situation in all countries and for both genders around 50% of the respondents live together with their partner and children. The prevalence of this "traditional role model", living in partnership and parenthood, is for both genders the highest in Hungary and lowest in Austria. The largest variations across countries and gender could be found in the group of single parents (living alone with children). There the prevalence was lowest in Switzerland (men: 1.3%, women: 6.2%) and highest in France among men (11.3%) and UK among women (17.7%).

The differences between both genders regarding expected years of schooling showed that in Switzerland and Germany expected years of schooling were lower among women than among men. In all other countries the expected number of school years was higher among women than men. The results regarding differences in unemployment rates between genders were mixed. The UK, Sweden, Norway, and Hungary showed lower unemployment rates for women than for men. In all other countries the unemployment rates of women were higher than those of men. The highest differences could be found in France and the Czech Republic.

Table 2. Prevalence of individual level variables by gender and country, and aggregated level data from the world bank database by country.

		SW	GE	FR	UK	SE	FI	NO	AU	CZ	HU
Men											
age	25-34	40.6	38.5	39.9	40.2	38.8	38.0	45.8	48.2	42.6	40.6
	35-49	59.4	61.5	60.1	59.8	61.2	62.0	54.2	51.8	57.4	59.4
education	middle	56.6	52.8	56.6	45.5	62.2	48.6	44.3	36.5	72.8	70.0
	high	31.6	42.9	31.8	33.4	27.7	34.9	35.1	3.5	20.4	14.6
employment	employed	93.5	83.2	91.6	80.3	87.9	86.5	86.6	93.2	92.1	76.2
family situation ¹	living with partner and children	48.3	53.1	50.1	42.5	49.2	50.5	57.1	41.7	46.2	63.5
	living with partner, without children	25.8	15.7	13.3	23.7	20.6	20.4	13.0	18.0	19.3	10.2
	living alone with children	1.3	4.8	11.3	6.8	4.9	2.1	2.7	6.4	2.9	1.5
drinking status	drinker	91.6	96.1	95.7	90.9	92.7	94.0	95.4	94.8	92.1	91.4
heavy drinking	yes	13.0	17.4	18.5	17.5	5.5	10.8	8.2	26.4	36.0	7.9
RSOD	at least once in the past 12 months	32.2	42.2	-	-	69.9	87.5	73.9	-	71.9	62.5
Women											
age	25-34	41.6	39.1	39.3	35.2	39.2	35.4	44.1	48.1	43.2	38.4
	35-49	58.4	60.9	60.7	64.8	60.8	64.6	55.9	51.9	56.8	61.6
education	high	68.2	61.4	53.6	51.5	54.6	41.3	45.2	40.1	71.2	57.7
	middle	12.7	31.8	32.4	27.8	36.8	44.8	38.2	3.5	21.5	19.1
employment	employed	68.7	55.6	72.8	61.5	77.8	74.7	74.7	63.9	78.8	63.5
family situation	living with partner and children	50.0	62.3	49.6	52.3	52.3	53.8	56.9	44.6	47.6	65.9
	living with partner, without children	26.6	15.0	14.3	15.5	22.1	22.2	14.4	21.9	21.4	9.7
	living alone with children	6.2	8.3	17.6	17.7	10.9	10.1	16.6	12.5	11.6	11.9
drinking status	drinker	78.7	94.9	91.2	88.3	86.0	94.8	95.7	86.8	82.5	78.0
heavy drinking	yes	4.5	10.4	5.8	9.3	2.8	3.4	2.6	6.1	11.8	0.6
RSOD	at least once in the past 12 months	7.8	13.4	-	-	40.4	57.0	45.5	-	38.2	28.8
World bank data											
Number of weeks for maternal leave		8.0	14.0	26.0	18.0	14.0	15.0	18.0	16.0	28.0	24.0
Birth rate		9.7	8.7	12.5	10.8	10.6	10.7	12.2	8.9	9.1	9.5
Fertility rate		1.5	1.4	1.9	1.7	1.6	1.7	1.8	1.3	1.2	1.3
Expected years of schooling, female		14.6	15.1	15.7	16.7	16.8	17.3	17.7	14.8	13.7	13.8
Difference of expected years of schooling between gender (female-male)		-1.0	-0.3	0.5	0.9	1.8	1.1	1.4	0.0	0.2	0.4
Activity rate, female		65.1	62.5	62.3	67.1	81.4	72.1	74.0	56.5	74.8	61.2
Difference of activity rate between gender (female-male)		-25.3	-18.5	-13.2	-16.5	-2.9	-4.0	-7.3	-22.3	-8.0	-17.3
GNP (in US \$)		36790	23540	22880	25230	26750	23940	36960	24230	5260	4820
Labor Force, female (% of total)		40.6	42.4	45.2	44.2	48.0	48.1	46.5	40.4	47.3	44.7
Unemployment rate, female		3.5	7.9	10.7	4.1	4.6	9.7	3.4	3.8	9.9	5.0
Difference of unemployment rate between gender (female-male)		1.8	0.1	3.6	-1.2	-0.7	1.1	-0.1	0.3	3.1	-1.3

Remarks: SW: Switzerland, GE: Germany; FR: France; UK: UK; SE: Sweden; FI: Finland; NO: Norway; AU: Austria; CZ: Czech Republic; HU: Hungary

¹ missing percentages to 100% are individuals, living alone without children

3.1 Drinking status

Table 3 summarizes the findings of multiple logistic regression models on drinking status. With one exception (Austria for women, Norway for men) drinking status was positively associated with income, though not necessarily statistically so in each country: the more money was available in the household, the more likely individuals were to be drinkers. In the age group of 25 to 49 year olds, age seemed not to be consistently related with drinking status. For each gender, five countries had positive associations between age and drinking status and five had negative associations. Within countries the sign of association differed by gender in four countries. Similar to income, education was usually positively associated with drinking status for men. However, for men in Austria and the Czech Republic both middle and high formal education were associated with a lower risk of being a drinker. In addition, for men in many countries the association with formal education was not monotonically increasing or decreasing; for example, high education and low education showed a lower risk of being a drinker compared to middle education. In women, the tendency was more homogeneous. In all countries except Finland and Czech Republic, women with low educational attainment had a lower risk of being drinkers than women with high attainment. Both countries, however, showed fewer drinkers in the low educational attainment group compared to the high educational attainment group in unadjusted bivariate associations (results not shown). Moreover, in seven of the 10 countries the risk of being a drinker increased monotonically with educational attainment. Employment showed the strongest association with drinking status: In all countries employed women were more likely, though not significantly so in all countries, to consume alcohol. For men this was not the case in Austria and Finland, where non-significant negative associations could be found. In unadjusted crude models, however, for both countries the effect was again positive (results not shown). Least influential for being a drinker as regards the variables used here was the family situation. Only for men in France and for women in Sweden did the inclusion of family roles increase the explained variance significantly (= the inclusion of the variable was significant as a block with 3 degrees of freedom). In addition, there was no discernible pattern for the associations with drinking status. For example, in Germany, couples without children were least likely to be drinkers, whereas singles with children were most likely; in Finland couples without children were most likely drinkers, whereas singles without children were least likely. Men were most likely to consume alcohol when living in a partnership and having children in Switzerland, Sweden, Finland, and the Czech Republic, whereas men in this role combination were least likely to be drinkers in Germany and France. With the exception of the interaction of education and gender in the UK, no significant interactions could be found for either education or employment status. As also indicated by the changes in the explained variance (Nagelkerke's R^2) social stratification was more important for drinking status than family roles. This applied for both men and women in approximately the same way.

Table 3. Country and gender specific regression coefficient of logistic regression models on drinking status; Nagelkerke's R² for a) control variables alone (income, age); b) education and employment in addition to a), and c) family situation in addition to b).

			SW	GE	FR	UK	SE	FI	NO ¹	AU	CZ ¹	HU
Men	Income	Income	0.016	0.070	0.801***	0.475**	0.702***	0.443*	-0.228	0.049	0.063	0.147
		Age continuous	0.021	-0.006	-0.011	0.000	-0.075**	-0.050	0.023	0.032	0.005	-0.019
	Education	low	0***	0***	0**	0	0	0	0	0	0	0
		middle	0.806***	0.849*	0.703**	0.515	0.586	0.772	0.938	-0.239	-0.779	0.729*
		high	1.230***	1.554***	0.241	-0.288	1.231*	0.273	0.484	-0.418	-1.393	0.392
	Employment status	employed	0.433	0.354	0.531*	0.410	0.620	-0.365	-0.099	0.534	1.053*	0.510
		couple with children	0	0	0**	0	0	0	0	0	0	0
	Family situation	couple without children (1)	-0.067	0.343	0.303	0.068	-0.087	-0.494	0.508	-0.372	-0.232	-0.187
		single with children (2)	-0.595	0.241	0.707*	1.462	-1.227	-0.101	-0.247	0.308	-0.131	-0.657
		single without children (3)	-0.113	0.146	0.863**	-0.289	-0.589	-0.055		0.224		0.823
	Constant		0.445	1.871	0.122	0.646	2.831	3.437	2.519	1.246	2.148	1.674
		R ² a	0.8%**	0.8%*	14.5%***	6.5%***	19.0%***	5.2%**	0.5%	0.4%	0.3%	2.7%*
		R ² b	3.8%***	3.5%***	16.1%**	8.9%	22.3%*	6.8%	2.3%	0.9%	4.1%**	5.7%*
		R ² c	3.9%	3.6%	17.5%**	10.8%	23.7%	7.3%	2.9%	1.5%	4.2%	7.5%
		change R ² ab	77.8%	75.6%	10.2%	26.9%	14.5%	23.4%	76.0%	60.0%	93.2%	53.0%
		change R ² bc	3.1%	4.4%	8.2%	17.9%	6.0%	7.2%	20.8%	40.6%	3.1%	24.5%
Women	Income	Income	0.133**	0.315***	0.160**	0.116	0.183	0.030	0.090	-0.006	0.083	0.032
		Age continuous	0.020**	-0.007	0.043***	-0.022	0.006	-0.004	0.018	0.027*	-0.020	-0.022
	Education	low	0***	0***	0***	0	0*	0	0	0	0	0*
		middle	0.879***	1.235***	0.730***	-0.037	0.957	0.518	0.519	0.191	-0.098	0.499*
		high	1.097***	1.992***	1.389***	0.925	0.641	-0.162	0.620	0.919	-0.226	0.998**
	Employment status	employed	0.202*	0.382	0.205	0.691*	1.340***	0.730	0.346	0.056	0.678**	0.335
		couple with children	0*	0	0	0	0**	0	0	0	0	0
	Family situation	couple without children (1)	0.218	-0.497	0.160	0.643	0.544	0.398	0.788	-0.051	0.088	-0.108
		single with children (2)	0.042	0.669	0.337	0.072	0.851*	0.190	0.544	0.175	-0.412	0.062
		single without children (3)	0.401**	0.118	0.136	0.259	1.352**	-0.696	-	-0.098	-	0.211
	Constant		-0.806	1.041	-0.692	1.887	-0.783	2.406	1.244	0.812	1.781	1.294
		R ² a	1.4%***	2.3%***	3.1%***	1.8%	3.9%***	0.6%	0.2%	0.6%	1.1%	2.1%*
		R ² b	5.9%***	7.6%***	6.6%***	6.8%**	13.3%***	3.1%	1.3%	1.1%	2.6%	5.7%**
		R ² c	6.4%	8.4%	6.8%	7.5%	16.7%**	4.6%	2.4%	1.2%	3.4%	5.9%
		change R ² ab	76.8%	69.6%	52.8%	73.2%	70.9%	79.6%	82.3%	46.3%	57.7%	63.9%
		change R ² bc	7.6%	10.3%	3.6%	9.4%	20.3%	32.8%	46.6%	10.1%	25.2%	2.3%
Interaction	Gender (main effect)	female	-1.033***	-0.494	-0.484*	-0.127	-0.283	0.646	0.037	-1.188***	-1.601*	-0.831*
		Interaction	0	0	0	0*	0	0	0	0	0	0
	education * gender	Low	0.322	0.433	-0.358	-0.550	0.018	-0.428	-0.394	0.396	0.679	-0.234
		Middle	0.116	0.683	0.006	1.017	-0.932	-0.717	0.309	1.213	1.217	0.419
	Gender	female	-0.798**	-0.207	-0.186*	-0.171	-0.689*	-0.368	-0.283	-0.560	-0.617	-0.745*
		employed * gender	-0.020	0.204	-0.632	0.069	0.296	0.755	0.352	-0.498	-0.253	-0.256
	Gender	female	-1.029***	0.061	-0.704***	-0.344	-1.023**	-0.021	-0.162	-0.990***	-0.784**	-0.849***
		fam. sit. * gender	0	0	0	0	0**	0	0	0	0	0
		fam. sit. (1) * gender (1)	0.185	-0.809	0.255	0.586	0.314	0.995	0.327	0.312	0.288	0.035
		fam. sit. (2) * gender (1)	0.724	0.302	-0.226	-1.085	1.856**	0.981	0.463	-0.055	-0.246	0.904
		fam. sit. (3) * gender (1)	0.501**	-0.114	0.048	0.790	1.610*	-0.091	-	-0.222	-	-0.803

Remarks: SW: Switzerland, GE: Germany; FR: France; UK: UK; SE: Sweden; FI: Finland; NO: Norway; AU: Austria; CZ: Czech Republic; HU: Hungary

¹ Couple with children, couple without children vs. single (with or without children); * >5%; ** >1%; *** >0.1%

Changes in R² signify changes from model a) to model b, and model b to model c.

3.2 Heavy drinking

The following analyses were based on drinkers only. In contrast to drinking status, heavy drinking appears not to be consistently influenced by household income (see Table 4). Significant associations could only be found for men in Norway and women in Switzerland and Germany. The direction of association varied within gender across countries and within countries across gender. For most countries heavy drinking increased with age. This could be found for both genders, with the exception of the UK and Sweden, where both sexes have a negative association between heavy drinking and age. Both sexes Norway showed the lowest association between heavy drinking and age.

For men in all countries - with the exception of the UK - heavy drinking rates decreased monotonically with education. Thus, individuals with lower education were most likely to drink heavily, whereas individuals with the highest education had the lowest rates of heavy drinkers. For women there were marked differences across countries. In four countries (Sweden, Finland, Czech Republic, and Hungary) the same tendency was found as for men, namely, higher rates of heavy drinking among individuals with lower education and lower rates for women with higher education. In four countries, Switzerland, Germany, France, and Norway the associations were opposite to those of men. For two countries, UK and Austria, no clear pattern for women could be identified.

Employment status showed no consistent association with heavy drinking across countries. Significant effects could only be found for men in Germany. According to the rule of thumb, coefficients of $-/+ 0.7$ could only be found for women in Norway or Hungary. It should be noted that for most countries the direction of effects were the same among men and women, with the exception of Hungary, Germany and Finland. In Germany and Hungary the effect of employment was close to zero. Thus, notable differences emerged for Finland only. Compared to the analyses on drinking status, family situation appeared to have more impact on heavy drinking than on drinking status, as indicated by generally higher R^2 changes when including the family situation. Broadly, two tendencies emerged: First, for men, living in a partnership was associated with lower risks of heavy drinking compared to being single. However, some exceptions could be identified. For example, in Sweden, living with a partner without having children or being single without having children showed the highest risks of heavy drinking, whereas living with a partner or alone and having children appears to be associated with lower risks for heavy drinking. In Czech Republic, Finland, and France, individuals living with a partner without having children had the lowest risks for heavy drinking. Second, for women, living with a partner and having children was commonly the most protective role combination. An exception was Switzerland where single mothers were less likely to be heavy drinkers. In Sweden, women living in a partnership had clearly lower risks of heavy drinking than singles-independently of whether children lived with them or not. In France, female singles had a lower risk of drinking heavily. For those two countries the differences were not significant.

When looking at explained variances and changes in explained variances from the model with social stratification variables only to the model including the family situation two tendencies can be found. It appeared that only in about half of the countries social stratification was more important for men. However, the additional impact of family roles was more often stronger for women than for men.

There were no consistent data for the combinations of employment and family roles for men. In five countries, where employment resulted in higher risks, the role combination of being married and having children was protective (Switzerland, UK, Sweden, Austria, and Hungary). In two countries

exactly the opposite was found (France and Finland), where employment was associated with a lower risk of heavy drinking, but the family situation of living in a partnership with children was associated with the highest risk. Role accumulation was best confirmed in Germany and Norway only, where employment and living with a partner and children were protective for heavy drinking. No clear pattern could be found for the Czech Republic. For women, living with partner and children was in most countries protective. In a few countries (Germany and Norway), being employed has an additional protective influence for women with regard to alcohol use; in these countries the role accumulation hypothesis was supported, as paid employment was associated with even lower risk, on top of the protective effect of parenthood and partnership. This is the case in France, Czech Republic, Norway and Hungary. On the other hand, there is also little indication for role overload because female singles with the fewest roles usually had higher risks for heavy drinking compared to married or cohabiting women with children.

The interaction between education and gender showed for most countries a particular vulnerability for heavy drinking among women with the highest education level. This means that if there were important ($b > 0.7$) or significant associations, these were usually positive. The effect was weak for UK and Hungary. Sweden and Finland are an exception to this, where women with the highest levels of education showed a slightly lower vulnerability compared to men. Thus, with the exception of Sweden and Finland, highly educated women were, relative to men, more likely to become heavy drinkers, with low educated individuals being the reference group.

As indicated, employment usually had the same direction of effects on heavy drinking for men and women within a country. As a consequence, there was little indication for differential vulnerability as indicated by gender interactions. The interaction was significant for Germany and strong for Finland, thus two countries where the sign of effect in stratified analysis differed between men and women.

All significant or important interactions between family situation and gender were positive. With the "traditional role" of living with a partner and children being the reference group in logistic regressions, this means that outside this role women are at higher risk for drinking heavily compared to men. More generally, compared to the "traditional role", most of the non-significant interaction effects had a positive direction. Notable exceptions ($b < -0.4$ equivalent to an odds ratio of 0.67; 0.4 being an odds ratio of 1.5) were Sweden, where women living in partnership without children had a lower risk, and UK and Switzerland, where single mothers had a relatively lower risk compared to the same role for men. Thus, with few exceptions women were more vulnerable for heavy drinking outside the traditional role of living in a partnership with children. Most consistent was the finding for women living in a partnership without children, who were, relative to men, more vulnerable for heavy drinking compared to couples with children.

Table 4. Country and gender specific regression coefficient of logistic regression models on heavy drinking; Nagelkerke's R² for a) control variables alone (income, age); b) education and employment in addition to a) , and c) family situation in addition to b); only drinker

		SW	GE	FR	UK	SE	FI	NO	AU	CZ	HU	
Men	Income	Income continuous	0.006	0.056	-0.058	-0.114	0.251	-0.088	0.376*	-0.030	-0.035	-0.217
	Age	continuous	0.019*	0.037***	0.058***	-0.005	-0.029	0.005	0.001	0.023**	0.012	0.031
	Education	low	0	0	0	0	0	0	0	0	0	0
		middle	-0.725***	0.071	-0.259	0.662	-0.350	-0.509	-0.790	-0.270*	-0.496	-0.494
		high	-0.901***	-0.159	-0.482**	0.135	-1.050	-0.728	-1.015*	-0.944*	-1.112**	-0.605
	Employment status	employed	0.295	-0.405**	-0.081	0.172	0.345	-0.674	-0.493	0.261	-0.100	0.055
	Family situation	couple with children	0	0	0	0	0	0	0	0	0	0
		couple without children (1)	0.034	0.083	-0.070	0.250	0.599	-0.504		-0.021	-0.227	
		single with children (2)	0.206	0.857***	-0.007	0.695	0.190	-0.297	1.924**	0.382	0.094	0.279
		single without children (3)	0.209	0.526***	-0.025	0.988**	0.581	-0.027		0.432**	-0.069	
	Constant		-2.215	-2.890	-3.073	-1.854	-2.792	-0.820	-3.265	-1.969	-0.062	-2.629
		R ² a		0.4%*	0.7%**	4.8%***	1.5%	1.9%	2.2%	0.0%	0.5%	0.9%
		R ² b		2.0%***	1.5%**	5.2%**	3.7%	3.4%	4.3%	3.2%	1.4%**	3.2%**
		R ² c		2.2%	2.9%***	5.2%	7.4%*	4.5%	4.9%	15.7%***	2.5%**	3.5%
		change R ² ab		351.1%	123.1%	9.0%	148.8%	80.7%	94.0%	83640.6%	187.2%	246.5%
		change R ² bc		7.4%	94.6%	0.3%	102.6%	29.6%	14.4%	385.1%	82.9%	7.2%
		R ² a		0.9%*	0.9%**	3.6%***	0.4%	0.0%	5.2%	5.0%	0.1%	0.1%
		R ² b		1.2%	1.6%*	4.2%	3.0%	2.7%	8.0%	7.4%	1.8%**	0.2%
Women	Income	Income continuous	0.178*	0.161**	-0.023	-0.105	0.029	-0.270	-0.038	0.071	0.064	0.765
	Age	continuous	0.009	0.029**	0.067***	-0.024	-0.005	0.059	-0.001	0.008	0.008	0.022
	Education	low	0	0	0	0	0	0	0	0	0	0
		middle	0.003	0.255	0.169	-0.156	-0.243	-0.693	0.054	-0.580**	-0.082	-0.548
		high	0.279	0.391	0.485	-0.013	-1.313	-1.124	0.328	0.406	-0.145	-1.326
	Employment status	employed	0.155	0.069	-0.318	0.641	0.555	0.462	-0.793	0.127	-0.152	-0.881
	Family situation	couple with children	0	0	0	0	0	0	0	0	0	0
		couple without children (1)	0.167	0.403*	0.386	0.817	-0.027	1.643*		0.494	0.864**	
		single with children (2)	-0.242	0.614**	0.019	0.219	1.130	0.807	2.237**	0.971**	0.588	0.673
		single without children (3)	0.237	0.750***	-0.121	1.043*	1.602*	1.041		0.987***	0.984**	
	Constant		-3.979	-4.221	-5.319	-1.690	-3.903	-5.386	-4.314	-3.472	-2.580	-7.397
		R ² a		0.9%*	0.9%**	3.6%***	0.4%	0.0%	5.2%	5.0%	0.1%	0.1%
		R ² b		1.2%	1.6%*	4.2%	3.0%	2.7%	8.0%	7.4%	1.8%**	0.2%
		R ² c		1.4%	2.8%**	4.5%	6.4%	8.8%*	13.2%	16.0%**	4.4%***	3.9%**
		change R ² ab		36.7%	74.8%	15.5%	607.3%	10862.9%	53.8%	47.9%	1983.0%	56.8%
		change R ² bc		17.5%	83.5%	9.6%	116.6%	224.8%	64.7%	115.8%	145.2%	1661.0%
		R ² a		0.9%*	0.9%**	3.6%***	0.4%	0.0%	5.2%	5.0%	0.1%	0.1%
		R ² b		1.2%	1.6%*	4.2%	3.0%	2.7%	8.0%	7.4%	1.8%**	0.2%
Interaction	Gender	female	-1.737***	-1.048*	-1.843***	-0.249	-0.350	-0.913	-2.023**	-1.519**	-1.815***	-2.813*
		education * gender	0***	0**	0**	0	0	0	0	0**	0	0
		education (1) by gender (1)	0.817**	0.275	0.375	-0.642	0.081	-0.424	0.786	-0.241	0.400	0.306
		education (2) by gender (1)	1.315***	0.789	0.886**	0.091	-0.387	-0.577	1.202	1.530**	1.039	0.004
	Gender	female	-1.019***	-1.033	-1.271***	-0.957*	-0.267	-2.045**	-0.875	-1.474***	-1.550***	-2.549**
		employed * gender	0.054	0.634**	-0.105	0.515	-0.119	1.027	-0.556	-0.078	0.254	-0.142
	Gender	female	-1.006***	-0.671***	-1.412***	-0.672*	-0.616	-2.350***	-1.818**	-1.867***	-1.887***	-2.673***
		farm. sit. * gender	0***	0	0	0	0	0*	0	0	0	0
		farm. sit (1) * gender (1)	0.198	0.496*	0.401	0.676	-0.728	2.282**		0.394	1.084**	
		farm. sit (2) * gender (1)	-0.595	-0.371	-0.054	-0.459	0.923	1.431	0.818	0.604	0.341	0.117
		farm. sit (3) * gender (1)	-0.041	0.191	-0.099	0.077	0.952	1.207		0.500	1.016**	

Remarks: SW: Switzerland; GE: Germany; FR: France; UK: UK; SE: Sweden; FI: Finland; NO: Norway; AU: Austria; CZ: Czech Republic; HU: Hungary

¹Couple with children, couple without children vs. single (with our without children); * >5%; ** >1%; *** >0.1%

Changes in R² signify changes from model a) to model b, and model b to model c.

3.3 RSOD

As can be seen in Table 5, household income is positively associated with RSOD for both genders, with the exception of German and Swedish women for which higher incomes were negatively associated with RSOD. However, these coefficients are very small in both countries. A common finding across European samples is that RSOD decreases with age (Gmel, Rehm & Kuntsche, 2003). Across almost all countries and for both genders, those with highest formal education have the lowest risk for RSOD. Exceptions were Finnish men (middle education) and Norwegian women (lowest education).

The influence of employment on RSOD was positive for almost all countries and both genders. Employed individuals had a higher risk for risky single occasion drinking than unemployed individuals. The exceptions were men in Hungary and men and women in the Czech Republic.

The highest risks for male RSOD as regards family situation were found for single men independent of having children. Mostly, lone fathers had the highest risk of RSOD, with the notable exception of Finland where this group had the lowest risks. Looking at the extremes of lowest and highest risk of the four defined family situations, only two countries, Germany and Hungary, showed the same pattern, where couples without children had the lowest risk and single men with children the highest. The heterogeneity of impact of family roles on RSOD across countries for men does not mean that there is no impact. The inclusion of family situation in regression models commonly resulted in an important increase of explained variance which was significant in four countries. However, the situation of families appeared to have a differential impact on RSOD for men.

For women, clearly the most protective role for RSOD is living with partner and children. The only exception is Hungary, where this combination has the second lowest risk for RSOD following the risk of single women without children. The R^2 -change when including the family situation generally confirmed that for RSOD family roles are more important for women than for men. For men, on the other hand, compared to women social stratification had a higher importance. It should be noted that this does not mean that family roles are not important for men compared to women, or that social stratification is not important for women compared to men. In both genders the inclusion of these variables resulted in increases in variance that were important across countries. For example, the inclusion of family roles was significant in four countries for men and in five countries for women. Social stratification was significant for women in two countries, and for men in three countries. However, usually the effects of social stratification were stronger for men compared to women, and the inverse was true as regards family situation.

As regards the role overload or role accumulation hypothesis, there is no clear pattern for men across countries, whereas for women it appeared that employed women living without partner and children had the highest risk for RSOD in almost all countries.

Table 5. Country and gender specific regression coefficient of logistic regression models on RSOD; Nagelkerke's R² for a) control variables alone (income, age); b) education and employment in addition to a) , and c) family situation in addition to b); only drinker

			SW	GE	SE	FI	NO	CZ	HU
Men	Income	income continuous	0.068	0.010	0.177**	0.159	0.101	0.032	0.067
	Age		-0.032***	-0.018**	-0.055***	-0.021	-0.068**	-0.007	-0.022
	Education	low	0	0	0	0	0	0	0
		middle	-0.025	-0.249	0.279	-0.470	0.084	-0.512	0.153
		high	-0.336*	-0.567**	-0.176	0.474	-0.122	-1.239*	-0.587
	Employment status	employed	0.261	-0.006	0.525	1.025*	0.267	-0.340	-0.225
	Family situation	couple with children	0	0	0	0	0	0	0
		couple without children (1)	0.331**	-0.151	0.446	0.588	0.478	0.280	-0.732
		single with children (2)	0.808*	0.363	1.793*	-0.925	0.629	0.497	0.380
		single without children (3)	0.602***	0.160	0.370	0.639	1.105***	-0.068	-0.144
	Constant		-0.042	0.742	1.746	1.988	2.954	2.341	1.657
		R ² a	2.5%***	1.0%***	5.2%***	3.5%	6.1%***	0.1%	0.4%
		R ² b	3.1%**	1.8%**	6.7%*	7.4%	6.2%	3.0%**	2.9%*
		R ² c	4.9%***	2.3%*	9.1%**	9.6%	10.2%**	3.4%	4.4%
		change R ² ab	19.94%	44.09%	23.00%	53.46%	1.89%	95.00%	85.26%
		change R ² bc	37.26%	19.03%	25.66%	22.50%	38.98%	14.28%	33.54%
Women	Income	income continuous	0.066	-0.028	-0.024	0.060	0.073	0.104	0.037
	Age		-0.024*	-0.019*	-0.081***	-0.065***	-0.049**	-0.013	-0.027
	Education	low	0	0	0	0	0	0	0
		middle	-0.169	-0.346	-0.214	0.014	0.194	-0.095	-0.478
		high	-0.136	-0.527*	-0.506	-0.600	0.058	-0.495	-0.534
	Employment status	employed	0.161	0.227	0.410	0.320	0.302	-0.021	0.295
	Family situation	couple with children	0	0	0	0	0	0	0
		couple without children (1)	0.412*	0.131	0.213	0.996***	1.179**	0.143	0.578
		single with children (2)	0.538	0.379	0.720**	0.810	1.003***	0.447	0.273
		single without children (3)	0.829***	0.515***	0.411	0.542	1.172***	0.609*	-0.223
	Constant		-1.870	-0.918	2.685	2.377	0.657	-0.002	0.508
		R ² a	0.5%*	1.0%**	8.4%***	4.0%**	3.3%**	0.4%	0.7%
		R ² b	1.2%	1.7%*	9.7%	6.9%*	3.9%	1.2%	2.0%
		R ² c	2.8%***	2.4%*	11.4%*	11.5%**	11.7%***	2.8%	3.3%
		change R ² ab	53.44%	42.22%	13.30%	41.43%	16.60%	68.54%	66.02%
		change R ² bc	57.77%	27.63%	15.00%	39.70%	66.45%	57.03%	40.20%
Interaction	Gender	female	-1.53***	-1.57***	-0.83*	-1.91***	-1.45***	-1.98***	-1.05**
		education * gender	0	0	0	0**	0	0	0
		education (1) by gender (1)	-0.150	-0.049	-0.403	0.482	0.016	0.485	-0.506
		education (2) by gender (1)	0.197	0.111	-0.348	-1.373	0.108	0.866	0.292
	Gender	female	-1.555***	-1.758***	-0.793*	-1.193**	-1.380**	-1.792**	-1.679***
		employed * gender	-0.055	0.283	-0.463	-1.164*	-0.025	0.399	0.491
	Gender	female	-1.671***	-1.721***	-1.169***	-2.368***	-1.523***	-1.569***	-1.462***
		fam. sit. * gender	0	0	0	0	0	0	0*
		fam. sit (1) * gender (1)	0.065	0.340	-0.139	0.479	0.708	-0.123	1.408**
		fam. sit (2) * gender (1)	-0.262	0.061	-1.124	1.832*	0.416	-0.124	-0.288
		fam. sit (3) * gender (1)	0.200	0.433*	0.275	0.515	0.077	0.660	-0.013

Remarks: SW: Switzerland, GE: Germany; SE: Sweden; FI: Finland; NO: Norway; CZ: Czech Republic; HU: Hungary

* >5%; ** >1%; *** >0.1%

Changes in R² signify changes from model a) to model b, and model b to model c.

Gender interactions with education were generally of lower magnitude and varied in direction across countries, pointing to no particular vulnerability for women with regard to association between education and RSOD. This was also substantiated by the fact that across all countries and for both men and women, higher education was associated with lower risk of RSOD (see above). The same tendencies for men and women across all countries were also found for employment. The gender interaction with employment, however, showed an interesting pattern with negative coefficients (lower vulnerability for women) in the Nordic countries, significant for Finland, and positive coefficients (higher vulnerability) for the other countries (except Switzerland, where the effect was close to zero). Living with a partner and children was commonly the most protective role for women and this seemed to apply more for women than for men. This is further substantiated by the fact that important or significant interaction effects of family situation were all positive (with the exception of lone parents in Sweden). Compared to the "traditional role", women had a relatively higher risk for RSOD in other family situations compared to men.

3.4 Aggregated analysis

As a final step countries were scaled by means of optimal scaling separately for RSOD and heavy drinking and both genders. As input for optimal scaling the regression coefficients of the logistic regression models were used. Commonly a two-dimensional solution was obtained (not presented). However, the second dimension was usually related to the control variables age and income. Thus, a one-dimensional solution was forced and explained around 50% of the variance in all models (see table 6). The internal consistency was high, with Cronbach's alpha being around 0.9 in all models.

Table 6. Unidimensional component loadings of optimal scaling of regression coefficient for the models on heavy drinking and RSOD

	Heavy drinking		RSOD	
	men	women	men	women
income	-0.48	0.78	0.92	0.78
age	0.81	0.61	-0.73	0.44
middle education	-0.79	0.66	0.30	0.62
high education	-0.59	0.92	0.80	0.78
employed	-0.32	-0.92	0.85	-0.69
couple without children	-0.96	-0.55	0.91	0.81
single with children	-0.70	-0.67	-0.70	0.62
single without children	-0.95	-0.72	0.76	0.78
constant	0.75	-0.20	0.48	-0.44
Cronbach's alpha	0.89	0.87	0.90	0.85
Variance explained (in %)	54.0	49.0	55.2	45.9

The structural data from the World Bank database (Table 7) were similarly scaled. With the exception of the difference in employment rates all variables loaded positively on this scale, indicative of measuring a work-welfare-equity index. Thus, for example, the higher the number of weeks for maternal leave, the higher the fertility rate, the higher labor force participation and years of schooling, the higher was the rank of countries on this scale.

The positive loadings for differences between men's and women's rates (for years of schooling, activity rates, and unemployment) mean the following: years of schooling were generally higher for women compared with men. Thus, countries rank high with a larger difference between men and women. Activity rates were commonly lower for women. Thus, countries rank high if this discrepancy was low. Unemployment was usually higher for women compared to men. Thus the negative loading means that countries rank high on this scale if the discrepancy between men's and women's unemployment rates is low. In general, countries ranked high if there is more gender equity, better education and a better social welfare system in a country, which is also related to better family care including more weeks of maternal leave and higher birth rates. The Cronbach's alpha for this scale was 0.90.

Table 7. Unidimensional component loadings of optimal scaling of data from the world bank

Number of weeks for maternity leave	0.44
Birth rate	0.80
Fertility rate	0.84
Expected years of schooling, female	0.91
Difference of expected years of schooling between gender (female-male)	0.91
Activity rate, female	0.75
Difference of activity rate between gender (female-male)	0.87
GNP	0.25
Labor Force, female (% of total)	0.84
Unemployment rate, female	0.34
Difference of unemployment rate between gender (female-male)	-0.20
Cronbach's alpha	0.90
Variance explained (in %)	49.6

To identify potential associations between predictors (regression coefficients) of drinking measures and structural data (scale of World Bank data and Siaroff's work desirability index) the scale values of countries were correlated. Significant associations were found for both the World Bank scale and Siaroff's work desirability scale for heavy drinking among women ($r=-0.93$, $p < 0.01$ for work desirability; $r = -0.73$, $p < 0.05$ for the world bank scale) and RSOD among men ($r = 0.88$, $p < 0.05$ for work desirability, $r = 0.84$, $p < 0.05$ for the world bank scale). All other correlations were not significant and low ranging between -0.2 and 0.2. The negative association of the World Bank scale and the work desirability index with countries' scaling of female's heavy drinking is related to the inverse loadings for the heavy drinking scale (Table 6). Component loadings show the following:

- (a) Countries rank higher the higher the positive association between age (income) and heavy drinking.
- (b) Countries rank higher the higher the positive association between heavy drinking and formal education
- (c) Countries rank higher the lower the impact of employment on heavy drinking, or the stronger the negative association between heavy drinking and employment.
- (d) Countries rank higher the lower the impact of family situations outside the “traditional” role on heavy drinking, or the stronger the negative association with these roles and heavy drinking.

To conclude, a country scores high on the heavy drinking scale if higher education is positively associated, employment is negatively associated and the traditional role (partner and children) is positively associated with heavy drinking.

Figures 1-4 show these associations. For women there was a strong association between structural variables and heavy drinking (Figures 1 and 2). At one end Finland, Sweden and UK have high values for work desirability and on the World Bank scale measuring social welfare and gender equity. These countries are characterized by heavy drinking being positively related to employment, low formal education and non-traditional roles. On the other end, countries with low work desirability and lower social welfare and gender equity were Germany and Switzerland, where heavy drinking of women was associated with high education, and little impact of traditional roles and employment on heavy drinking.

For men similar associations could be found with RSOD (Figures 3 and 4), with Norway, Sweden and Finland at one end, and Germany and Switzerland on the other. Thus, better social welfare and gender equity was associated with RSOD drinking among men. In lower social welfare countries with lower gender equity, unemployed and lower educated men show more RSOD drinking, whereas in countries with higher social welfare/gender equity employed and high educated showed relatively more RSOD compared to unemployed and low formally educated.

Figure 1. Regression of the heavy drinking scale on the work desirability scale, women

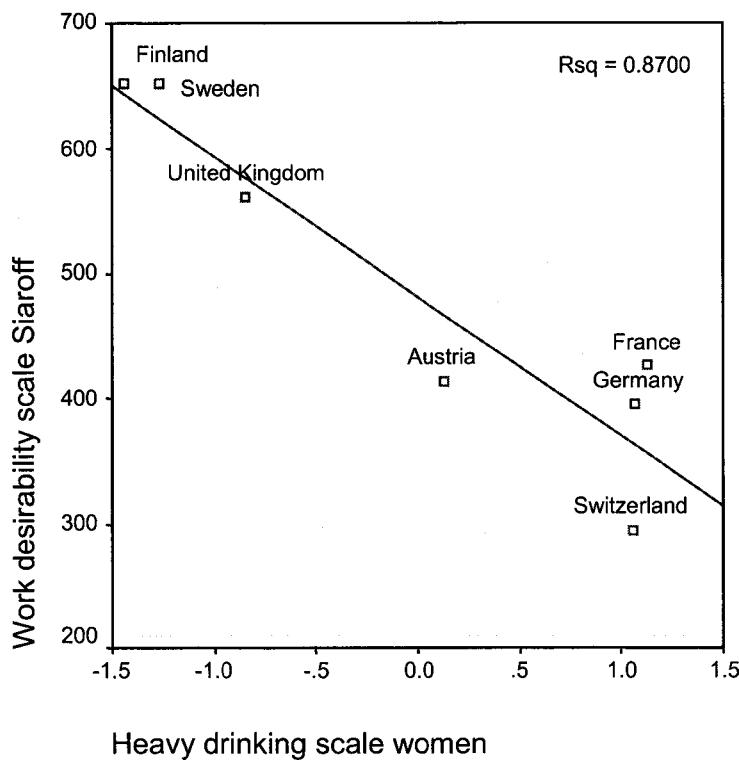


Figure 2. Regression of the heavy drinking scale on the work-welfare-equity scale, women

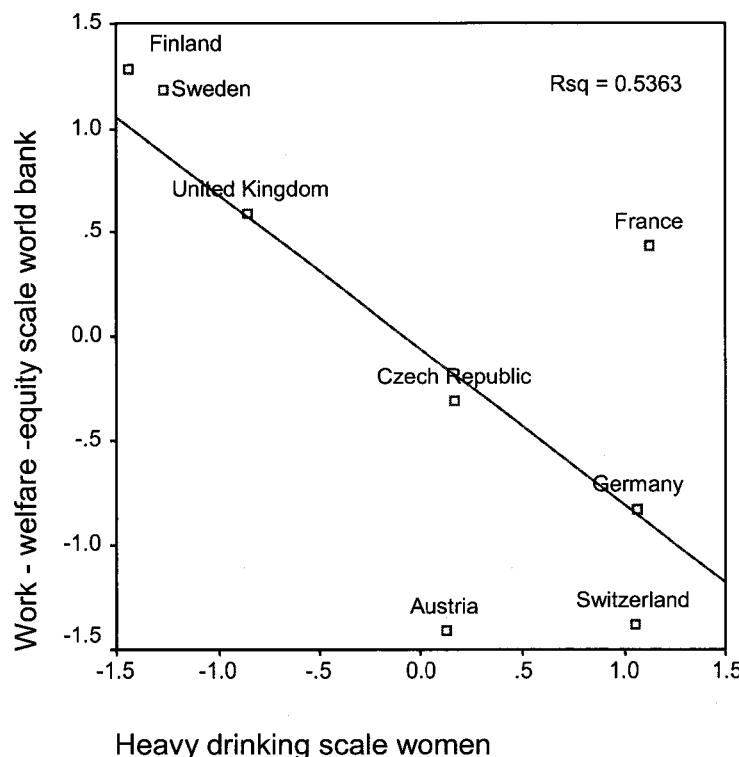


Figure 3. Regression of RSOD on the work desirability scale, men

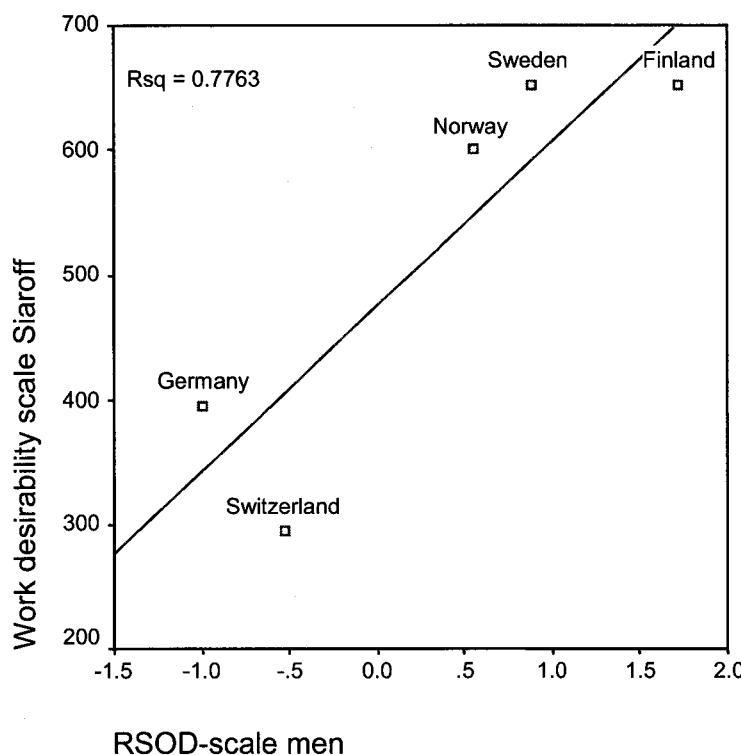
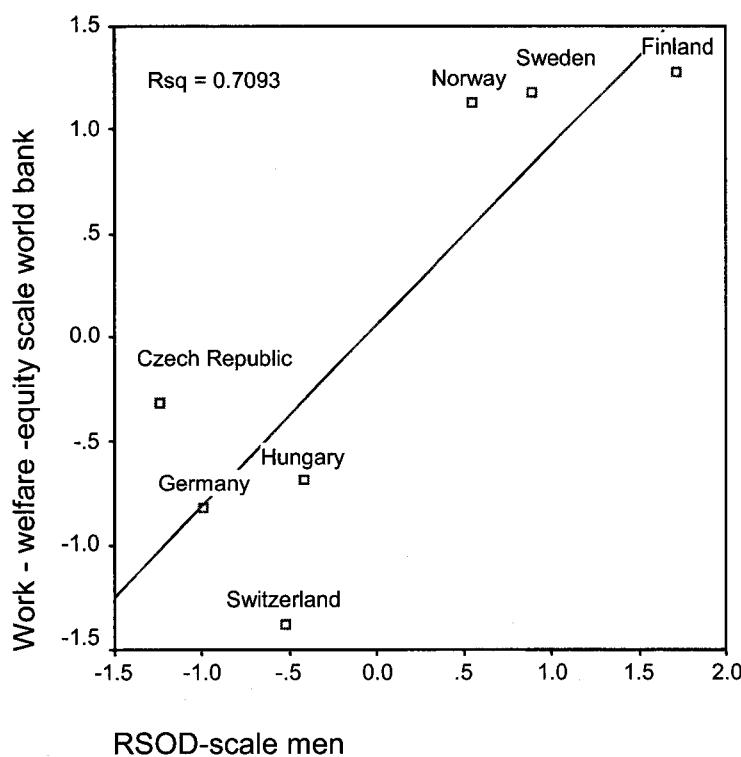


Figure 4. Regression of RSOD on the work-welfare-equity scale, men



4 DISCUSSION

The present paper has presented the impact of social stratification and family roles on drinking status, heavy drinking, and RSOD in 10 countries. The study finds no indication that for men only social stratification (here measured by employment and education) variables should be used to explain differences in men's drinking. Family roles are not only important for women but also for men. No single role theory (role attachment vs. role overload) could consistently be found to apply across all countries or within a country for both genders. Findings on differential gender vulnerability were mixed as regards employment and education, and differed for the alcohol measure used and among countries. As compared to men, women of higher education seem to be more at risk to drink heavily, i.e. in a chronic way, and employed women are more vulnerable for RSOD, i.e., thus drinking heavily on infrequent occasions. Any exceptions to these general tendencies tended to come from the Nordic countries. It appears that in almost all countries women without children were relatively more vulnerable for heavy drinking and RSOD compared with men. There are many differences across countries as regards what predicts men's or women's drinking. These differences partly seemed to be explainable at the macro-level, i.e. how extensive the social welfare system is and how much gender equity is present in a country. Interestingly, those macro-level associations predicted women's chronic (heavy) drinking and men's risky single occasion drinking.

Whether someone drinks or not appears to be related most clearly to social stratification, i.e. income, formal education, and employment. This was particularly true for women. Individuals with higher income, educational status, and employment status are more often drinkers, which is a consistent finding in the literature (McCann *et al.*, 2003, Casswell, Pledger & Hooper, 2003). Family roles had the lowest impact as regards drinking status, which should not come as a surprise. In most cases the decision to drink or not takes place in adolescence or young adulthood, whereas roles such as being married or becoming a parent are of minor relevance, while education and career are often predetermined already at younger ages, e.g. through the family situation in which adolescents are living (e.g. Sieben & de Graaf, 2001, Manor, Matthews & Power, 2003).

Education was usually negatively associated with heavy drinking in men. There are some studies showing that education has another impact on women's chronic alcohol use, i.e. more heavy drinking in the higher educated groups (Ahlström, Bloomfield & Knibbe, 2001). This was not consistently the case in the present study. However, better educated women usually showed a higher vulnerability compared to their male counterparts to drink heavily. It has been argued, for example, that women in higher positions more often behave like men or simply have more occasions to drink, e.g. in business meetings (Haavio-Mannila & *et al.*, 1990, Haavio-Mannila, 1991, Hammer & Vaglum, 1989). Assuming that higher education is also associated with higher occupational position, the findings of the present study therefore tend to show, that higher job positions are even more strongly related to heavy drinking for women than for men. To the contrary, high compared to low former education was predominantly protective for RSOD in both genders.

Findings on employment status as regards heavy drinking were inconsistent across countries but within countries associations tended to go in the same direction for men and women, whereas for RSOD the employed had higher risks than the unemployed. This was consistent across most countries and both genders. The present study shows that employment is not protective, particularly as regards RSOD. At the moment we can only speculate on the explanation for this finding. One

possibility is that RSOD is used as a means of coping or reducing tension on weekends. Further research should include measures of occupational class and work stressors. Several theories (Siegrist, 1996, Karasek, 1979) particularly link the level of demand, control, and occupational hierarchy with work strain, which may in turn be related to problematic alcohol use (Koopman *et al.*, 2003, Delaney *et al.*, 2002). Concerning the relation between alcohol consumption and unemployment, the literature is inconsistent (Mullahy & Sindelar, 1996) and findings depend on the length of unemployment (Gallant, 1993, Liira & Leino-Arjas, 1999, Claussen, 1999), with RSOD being positively associated mainly with long-term unemployment. Generally the literature tends to show that unemployment is more closely related to problem drinking including RSOD than volume of drinking, e.g. chronic consumption. This is confirmed by the present study.

Due to the mixed findings on employment status as regards heavy drinking and RSOD the multiple attachment hypotheses cannot be generally accepted. Focusing on family roles only, the multiple attachment hypotheses appears to hold for women. The present study showed in particular that living in a partnership and raising children was the most protective role combination for women. The family situation is of utmost importance. Singles lack the attachment provided by partner and unemployed lack the attachment to the community provided by a job. Unemployment may have a lower impact if the support is provided by the partner and similarly the social support in the working field may counterbalance the lack of partnership. It has been argued that lone parents form a critical case for both hypotheses of employment and partnership, and that this may be influenced by the social system of a country (Lahelma *et al.*, 2002). Full-time employment can result in role strain if there are few welfare services. Similarly, unemployment or part-time employment can result in financial strains if not buffered by the income of a partner. Across different extensively developed welfare systems, the present study almost consistently showed that among women partnership and raising children is protective against risky alcohol consumption, whereas single parenthood is associated with increased chronic alcohol consumption and RSOD. This indicates that besides the impact of different welfare systems, a traditional female role model still exists and influences women's drinking behavior even in countries with a long history of emancipation such as Finland or Sweden.

As confirmed by many findings in the literature on health inequalities, there is a need to include both social stratification and family situation predictors to model men's and women's drinking (Lahelma *et al.*, 2002). There is a tendency to assume that social stratification is more important for men, whereas family roles seemed to be of higher importance for women. Depending on the country or the drinking measure (RSOD, heavy drinking), education and employment explained even more variance among women or family situation among men. This can also be inferred from the macro-level association with the World Bank's work-welfare-equity index or the work desirability scale. Interestingly, these scales were associated with predictors of female's chronic heavy drinking and men's risky single occasion drinking. It appears that this is related to cross-country variability in the impact of either family roles or social stratification on drinking measures used. Higher education was associated almost consistently across all countries with lower heavy drinking rates for men, whereas there were marked differences for women. On the other hand, family roles were consistently associated with RSOD in women and showed more variation in men. Most pronounced was the aggregate association which separated the high welfare systems in the Nordic countries from other European countries in showing that social environment plays a role in what is predicted for drinking. One could also argue that those differences were due to a country-specific drinking pattern, i.e. notorious RSOD styles in Nordic countries

compared with higher regular chronic drinking in other European countries. It should be noted that we did not model absolute drinking rates but regression coefficients and thus the relative impact of roles within countries. Therefore our findings point to the social-family environment as being predictive for differences in role effects and not only the drinking culture.

In the foreground of the present study stood the comparison of almost all European countries available in the GENACIS data set. This afforded the analyses to be restricted to comparable, but often crude measures. There is enormous literature, for example, on the impact that the age of children in a household may have as regards stresses related to childcare. Another unexamined potential influence is not only whether one is employed or not, but also particular work conditions which have shown differential effects on health outcomes. Future comparative analyses should focus on specific aspects of roles while limiting the number of available countries for such an analysis. The present study, however, clearly demonstrates that the understanding of women's and men's roles on drinking must include both social stratification and family roles, and that these analyses have to consider both micro-level and macro-level influences within a country.

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Chapter 8: Societal-level factors

The Influence of Societal-level Factors on Men's and Women's Alcohol Consumption and Alcohol Problems

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1 INTRODUCTION

The attempts to describe, analyze, and explain the drinking behavior of individuals and its consequences, should not blind our eyes to the distinctions between societies. These distinctions are based on several scientific traditions. The study of public health, and particularly epidemiology, as disciplines is one of these. The epidemiology of health problems justifies examining societal differences on several grounds. One of these is that there are genuine population-level risk factors. These risk factors are significant and independent both analytically and ontologically. A second reason is that population characteristics often serve as catalysts, or as modifiers of individual-level processes. Thus, for example, living at subsistence level may have very different implications in a poor society than in a rich one (Pearce, 2000)

The other major scientific tradition underlying the study of populations, such as whole societies, or regions, is the tradition of social sciences. Early in the 19-th century Quetelet showed regularities in the differences across populations (and particularly relevant – between men and women) in rates of crime (Quetelet, 1842). Later in that century Durkheim (1897) argued strongly that social facts should be explained by social facts. Based on a series of earlier studies he was able to explain temporal and regional variations in the rates of suicide by social and cultural characteristics. Anthropologists have often adopted a more holistic approach, characterizing whole societies (mostly non-industrialized ones) by themes underlying their cultural traits. Thus, Benedict (1934) characterized some of the tribes that she studied as having an Apollonian or a Dionysian culture.

A third approach to this issue has been methodological. Social scientists have insisted that population characteristics include at least two distinct types of variables. First, there are variables which are defined by the aggregation of individual-level data. We may consider the rate of abstinence or the median quantity of alcohol consumed as examples of this type of variables. But there is also another type of group-level (societal) variable, variables that cannot be measured on the individual level.

These may include characteristics of social structure, organs of society, and so on. For instance, these may include the extent of social inequality, or the presence of legal regulations on alcohol sales (Kendall and Lazarsfeld, 1955).

The study of alcohol use and its consequences at the country level has led to a growing body of knowledge about differential consumption patterns that reflect differences in culture, tradition, religion, social position, income, occupation, gender, region and a host of other factors. They also often change over an individual's lifetime and may also change considerably over time among different social groups (e.g. Pittman and White, 1991; Heath, 1995; Hibell, Andersson, Ahlstrom, Balakireva, Bjarnasson, Kokkevi and Morgan, 2001).

Thus, there is a long tradition of attempts to distinguish among societies by their distinct patterns of alcohol consumption. In the last decade or two some of these attempts are expressed in attempts to distinguish between "wet" and "dry" countries. This distinction (which initially seemed to be based on the average amount of alcohol consumed in a country and its correlates) is based on several former attempts to classify countries (Room 1988; Room and Mäkelä 2000). These attempts tried to characterize "drinking cultures" and to identify some of their social correlates. Thus, there are claims that several southern European countries share some aspects of a drinking culture.

The "wet"–"dry" distinction has often been used to describe a continuum which is closely associated with the amount of alcohol consumed and the prevalence of drinking, but (presumably) has several other characteristics as well. Thus, wet countries are often characterized by a high rate of drinkers (and few abstainers), consumption of low or moderate alcohol quantity at a time, a large number of situations in which drinking is common and perhaps normative, drinking mostly at meals (typically wine), frowning on insobriety, and widespread mechanisms of informal social control of drinking. Generally speaking, these are described as societies in which alcohol consumption is well-integrated into the daily conduct of social life. In dry cultures the opposite conditions prevail: occasions of consumption are relatively rare, consumption is frowned upon, and there is a high proportion of abstainers.

While these descriptions are somewhat stereotypical they seem to convey a distinction that does exist in reality. Thus, wet countries are exemplified by the southern European, Mediterranean countries, and typical dry cultures are exemplified by the Scandinavian countries and the United States. However, some recent studies suggest that even if the two types did exist in the past, the differences have begun to disappear, at least in Europe, and there is a convergence of the modes, quantities and situations of drinking (Leifman, 2001; Allamani et al. 2000). Other studies suggest that while the wet-dry continuum may have been useful for characterizing European cultures, the classification of other countries, mostly from South America, Asia and Africa, may require the addition of other dimensions (Room and Mäkelä, 2000).

1.1 Gender Differences

Recent studies have confirmed what has been known from impressions for a long time: women tend to consume alcohol less than men, and men's drinking typically has led to more (and more serious) social problems. This generalization has been validated in virtually every study on the issue (Wilsnack, Vogeltanz, Wilsnack, Harris et al., 2000). Systematic, quantitative studies of the gender gap in drinking range from the classic, comparative analysis of simple societies done by Child, Barry and Bacon (1965) to the meta-analytic study of Wilsnack, Vogeltanz, Wilsnack, Harris et al. (2000) who compared the findings of 16 studies in 10 countries. The findings were rather consistent in presenting men as drinking more frequently and larger quantities than women.

While there are several approaches to explaining this difference, they tend to rely, one way or another, on the differential social positions of women and men and on the differential cultural demands they have to meet (Blume, 1994). Comparative analyses suggest that the distinction in drinking tends to be larger where social and cultural gender distinctions are larger (Gefou-Madianou, 1992).

The hypothesis that gender differences in drinking are associated with gender differentiation in social roles and statuses has been discussed before, particularly since there have been suggestions that the gender-related drinking patterns tend to converge (cf. Bloomfield, Gmel, Neve and Mustonen, 2001). If the gender gap in drinking is a consequence of gender-based role differentiation, one should expect such convergence to be the result of the growing equality achieved by women.

1.2 Purposes

The present paper reflects the efforts of one of the work packages of the EU Concerted Action "Gender, Culture and Alcohol Problems: A Multi-national Study" to analyze how societal-level factors (e.g., gender equality, drinking culture norms) predict women's and men's alcohol use and alcohol-related problems in various regions of Europe and elsewhere. The EU project is imbedded in a larger study "Gender and Alcohol: An International Study" (GENACIS) which at present comprises general population survey data from 29 countries within as well as outside Europe.

As mentioned, several decades of international alcohol research have indicated that differing drinking cultures exist. Moreover, gender and political science research has attempted to characterize countries by the social position of women to aid in specifying the development of gender-relevant policies. These two societal-level dimensions, drinking culture and the social position of women, have particular relevance in helping to explain, on a "higher" level, the results found in an international study. The diversity of countries in our project allow, among other research goals, certain analyses of societal characteristics as possible predictors of patterns of men's and women's alcohol consumption and related problems across societies. This information will be useful in helping to develop a social and health policy within the European Union which can be more regionally, culturally as well as gender-sensitive.

The present analyses have the following goals:

1. To describe the alcohol consumption of men and women at the societal level of analysis and to identify some of its predictors. That is, to look for societal correlates of rates of alcohol consumption by men and women.
2. To identify some of the predictors of alcohol-related problems of men and women at the societal level of analysis.
3. To examine the association between gender inequalities and male-female differences in alcohol consumption and consequences.

2 METHODS

2.1 Drinking indicators

The data for this paper were obtained from several sources: data on the extent of alcohol consumption were obtained mostly from the GENACIS surveys. The major exceptions were

- (1) In a couple of analyses WHO's Global Alcohol Database (WHO, 2003) were used. These cases were explicitly noted, so that unless it is otherwise stated, the data are from the Genacis surveys.
- (2) For some countries two or more surveys' data were available (mostly the GENACIS data as well as the ECAS data (Leifman, Osterberg and Ramstedt, 2002). In these cases, when data for both men and women were available, the mean of the two sources was used.

The major indicator of the extent of drinking was current drinking – the percentage of the population consuming alcohol once or more during the past year. This variable is rather crude, distinguishing mostly between drinkers and non-drinkers, and it tells us little about the pattern of drinking. A more refined indicator (which may be related to the intensity of drinking as well) is the percentage of drinkers who drank alcohol during the past week ("weekly drinkers"). The major indicator of the intensity of drinking was the percentage of drinkers who consumed more than 8,468 grams pure alcohol during the past year ("heavy drinkers"). This cut-off level indicates an average of one ounce of pure alcohol per day. Both weekly drinking and heavy drinking were assessed only for current drinkers. Therefore, these figures may be more sensitive to differences in the definition of the base population. Both weekly drinking and heavy drinking are based on the highest tail of their respective distributions (of the frequency of drinking and of the typical daily alcohol consumption), and both may be sensitive to age distribution in each country. Therefore, standardization of our data for age seemed desirable. Otherwise, differences in the age structure of the population and age limits on the sample might bias the results. For instance, if the higher age groups tend to drink more, and if some countries have a higher proportion of the higher age groups, these facts alone may render these countries more likely to present higher consumption. In order to avoid that problem, the drinking intensity variables (weekly drinking, heavy drinkers and heavy episodic drinking) were assessed only for the 18-34 age-group.

2.2 Consequences

Alcohol consumption has been associated with a large number of problems. Many of these are subject to differences in cultural assessment, and thus are unsuitable for country-level analyses. Therefore, for the sake of the present analysis, we decided to limit ourselves to the extreme tails of the problems distributions, and that only for those indicators which have the most detailed, "objective" definitions. Thus, we relied on the rate of mortality from alcohol dependency as a global, country-level indicator of the chronic health effects of alcohol consumption.

Thus, two indicators of acute health consequences at the country level were used. One was the standardized death rate from liver cirrhosis, and the other – death rates from motor vehicle crashes (Stockwell, Chikritzhs and Brinkman, 2000). While each of these phenomena is caused by other factors as well, they do reflect (at least – to some extent) the effects of intoxication too. In fact, the rate of death from liver cirrhosis is often used as a proxy for the rate of alcohol problems. These rates, broken down by gender, were available from the Global Status report on Alcohol (WHO, 1999).

While these indicators were selected with the idea that indicators should be selected while bearing in mind their general availability, and also depending on sources other than the GENACIS surveys, one indicator of acute consequences was available from the GENACIS reports only. This was the rate of alcohol-related physical aggression by a spouse or partner, as was calculated by another work-group in the present study. This indicator was selected due to its significance within the context of alcohol-related gender relationships.

Other data on countries were obtained from a variety of sources, including the United Nations' statistical yearbook, the World Bank (2000), the Human Development project (2002), the World Values Survey 1990-1991 (Inglehart, 2003), the International Social Survey (ISSP, 2003) of 1994, as well as a host of other sources. (Lin Chang, 2000; Stockard and O'Brien, 2002; Blackburn, Jarman and Brooks 2000; Fernquist, 1999; Stier and Lewin-Epstein, 2001).

The countries in this analysis included the EU countries that participate in the GENACIS project, as well as other countries. The decision to include all 29 countries in the project was based mostly on the desire to increase the number of units of analysis, and thereby the validity of the findings. However, the reader should be aware that this decision might have two additional side-effects. Increasing the number of countries, and particularly the inclusion of countries from Asia, Africa, and Latin America, clearly increased the variability of some variables. This could lead (1) to higher correlations where only very low ones might have been observed if only the EU countries were included; and (2) to masking some of the relationships among variables that might be observed if only EU countries were to be included.

Table 1. List of variables

Variable	Meaning	Source
Alcohol Consumption		
Drinkers	Current drinkers =Percent drinking during the past year	Genacis
Weekly Drinkers	% of current drinkers who drink at least once a week, age: 18-34.	Genacis
Heavy Drinkers	% current drinkers who drink at least 8468, age: 18-34.	Genacis
Heavy episodic Drinking (HED)	% drinkers engaged in HED at least once a year, age: 18-34.	Genacis
Alcohol Consequences		
Liver Diseases	Death rates from cirrhosis and liver diseases	Global Status Report on Alcohol
Alcohol dependency	Death rates from alcohol dependency syndrome	Global Status Report on Alcohol
Motor vehicle crashes	Death rates from alcohol-related motor vehicle crashes	Global Status Report on Alcohol
Alcohol-Related mortality	Sum of the death rates from liver diseases, alcohol dependency, and motor vehicle crashes	Calculated
Aggression	Physical aggression	Genacis
Gender and Women's position		
GEM	Gender Empowerment Measure	World Bank, 2000
Egalitarianism	Gender "Egalitarianism"	Fernquist
Hofstede	Cultural masculinity index (MAS)	Hofstede, 2001
Family change	Change in traditional family roles	Stockard & O'brien, 2002
Parental benefits	Substantive benefits for working parents	Lin Chang, 2000
Occupational equality	legally mandated equality of occupational access	Lin Chang, 2000
Women Friendly Institutions	Index value of Women Friendliness	Stockard & O'brien, 2002
Gender Equity	Participation in the economy, politics, and higher education	Verweij & Nieuwbeerta , 2000
Gender Equality	A factor score of questionnaire items in multi-national surveys	Inglehart & Norris, 2003
General Country Characteristics		
GDP	Gross domestic product per capita	Human Development Report, United Nations, 2002
Human Development Index	A composite index of various aspects of material welfare	Human Development Report, United Nations, 2002
Urban	Urban population as percent of total	Human Development Report, United Nations, 2002
Higher Education	Enrollment in Tertiary Education	Human Development Report, United Nations, 2002
Gini	The Gini index of inequality in income	World Bank, 2002
Fertility	Total fertility rate	United Nations, 1999
Church	% going to church at least once a year.	Guiso et al., 2003
No God	Percent of the population who do not believe in god	Guiso et al., 2003
World Values Survey	A special analysis of the 1994 World Values survey	World Values Survey, 1991-1992
ISSP	A special analysis of the ISSP 1994	International Social Survey Program, 1994

One of the major methodological problems was calculating the "gender gap" in drinking for the various drinking indicators. The simplest measure seemed to be the male/female ratio. Thus, one might calculate gender gap in the prevalence of drinking as the rate of male current drinkers divided by the rate of female current drinkers. This option has some advantages, but it suffers from a serious problem: when small numbers are involved, the ratio may become very high. These ratios not only bias distributions, they also lead to spurious correlations which may change considerably (even change sign) by the omission of one or two cases. This emphasized the need to inspect the scattergram associated with each correlation coefficient, but also the need to find an alternative, simple way to measure the gender gap. While there are several potential solutions to this problem (e.g., adding a constant, or using the logged data, or resorting to nonparametric statistics) we selected what seemed to be the most common solution (despite its drawbacks) in studies of gender and alcohol: the gender ratio. That is, the ratio between the proportion of men with a certain trait or characteristic and the proportion of women having it.

3 GENDER AND DRINKING

3.1 Development of a measure of women's status

As one of the major issues in this project is the status of women in society, several approaches to the measurement of this variable were attempted. The major variables were women's participation in the labor force (as compared to men's), women's proportion in managerial positions, in the parliament and in higher education, and the difference between men's and women's earnings (indices of occupational segregation were attempted but were dropped as they did not yield consistent results). Some other variables, reflecting mostly public opinion were based on the World Values Study (Inglehart, Basanez & Luijkx, 2003); e.g., the percent (in each country) endorsing statements such as:

- "When jobs are scarce, men have more right to a job than women",
- "A woman has to have children in order to be fulfilled",
- "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work"
- "A pre-school child is likely to suffer if his or her mother works".

Data from another survey (the International Social Survey) (ISSP, 2003) yielded information on the domestic division of labor, e.g., the percent answering "mostly the woman" to questions such as:

- "...in your home, who does the laundry?",
- "...who cares for sick family members?", or
- "...who makes small repairs around the house?".

In addition, two more global indicators were taken from available sources. First, the Gender Empowerment Measure from the United Nations' Human Development Project (United Nations, 2002) was used. This is a composite index measuring gender inequality in three basic dimensions of empowerment: economic participation; economic decision-making; and power over economic resources; and as such, it is an index of women's involvement in the economy. Second, Hofstede's

index of cultural masculinity (MAS) was used (Hofstede 1991, 2001). The theory underlying this index is that societies differ along a cultural dimension which may allow one to designate them as more or less oriented to traditional male values (e.g., power and toughness). Those societies which score higher on this orientation are also the ones that make a sharper distinction between male and female social roles

Several approaches were used to construct a new index of Gender Equity. First, factor analysis of the attitude items from the World Values Survey (Inglehart, Basanez and Luijckx, 2003) was used to develop an index of attitudes favorable to women's social participation. This analysis yielded two components (factors) with the first one loading highly on items such as "Men have more right to work when jobs are rare", "Child will suffer if mother works", and "A woman needs a child and home". However, this did not seem to provide an adequate indicator of women's position. First, because it was based only on attitude items, and second, because it yielded scores only for 22 of the countries.

Another approach was based on factor analysis of several variables, reflecting women's participation and women's roles in several spheres of life. Several such analyses were tried for two reasons. First, with such a small number of cases the solutions tend to be unstable. Thus, a small change in the variables list might lead to a rather different ordering of the countries. Second, because data on most variables were available only for a selection of countries, factor scores could be obtained either for more countries, based on fewer variables, or for fewer countries, based on more variables. As an illustration, one of the better solutions was based on an analysis of the Gender Empowerment Measure (GEM; World Bank, 2000), proportion of women in the parliament, women's labor force participation as percent of men's and women's proportion in the professions, and women's life expectancy, compared to men's. Ranking countries by the first component of this analysis put the Nordic countries at the top, followed by Canada, the Netherlands and Germany. However, even this solution allowed us to rank only 22 of the countries.

In order to overcome these problems another approach was taken. Standard scores were calculated for each of the following variables: the GEM, percentage of women in the parliament, women's labor force participation as a percentage of men's, women's earnings as a proportion of men's, women's proportion in higher education, and the country's score on the attitudes factor mentioned above. A country's mean standard score on these variables (or those of them for which information was available) was named its Gender Equity Score (GES).

This approach has several advantages. First, it provides us with scores for all the countries in the sample. Second, it has face validity, as it is based on women's position in a variety of domains. Third, this score seems to have good psychometric properties: It had a Cronbach's alpha of 0.89 (n=19) with all six variables included and alpha=0.84 (n=20) with 5 variables (without the attitudes factor score).

Table 2. Correlations between Gender Equity Scores and other potential indicators

	GEM	Egalitarianism	Hofstede's Cultural Masculinity	Family Change	Parental Benefits	Legal Occupational Equality	Women Friendly institutions
GES.	0.85	0.43	-0.61	0.41	0.44	0.79	0.58
P<	0.01	0.10	0.01	0.21	0.17	0.01	0.06
N	22	16	21	11	11	11	11

Note: Coefficients in bold face are significant at the 0.10 level

Table 2 presents the correlations between the calculated emancipation scores and other potential indicators of women's position in society. The first, Gender Empowerment Measure (GEM), is the indicator provided by the UN. Obviously, it is highly correlated with the calculated scores since it is included in the GES. The second variable, gender egalitarianism, is an index calculated by Fernquist (1999) on the basis of three variables: marital rape's definition as a crime, paid pregnancy leave, and legal abortion. The third variable is Hofstede's MAS index of the "masculinity" of the culture. The fourth is the extent of change in the traditional family (Stockard and O'Brian, 2000). The fifth variable is the availability of substantive benefits for working parents (Lin Chang, 2000), the sixth measures legal equality of occupational access (Lin Chang, 2000), while the last indicates a country's extent of women-friendly institutions (Stockard and O'Brian, 2000). Regardless of the details of these indicators, we would expect them all to be well-correlated with any valid indicator of women's social position. And they are. The absolute values of the correlation coefficients range from 0.39 to 0.85, and they are all in the expected direction. These correlations may therefore be considered indicators of the validity of the emancipation scores.

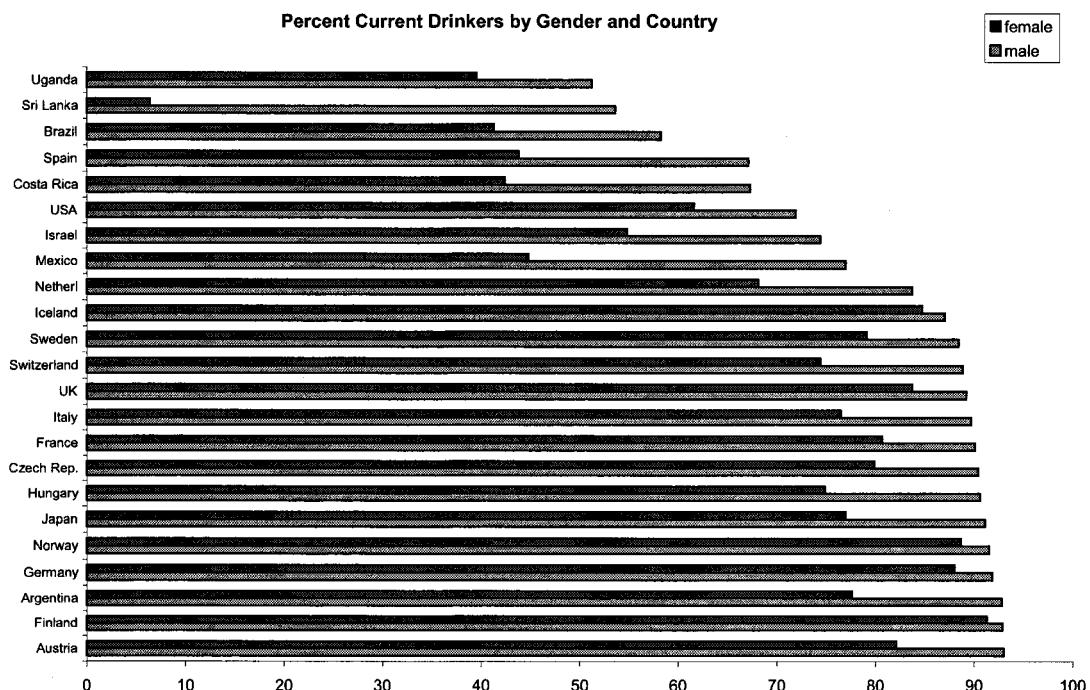
As an additional test of validity of the GES, the countries' scores were correlated with two other, related scores developed by other investigators. Verweij and Nieuwbeerta (2000) developed an index of Gender Equity which was based on women's share in the labor market, higher education and parliament. For the 14 countries for which both indices were available, this index correlated 0.89 with the GES. While their approach was rather similar to the one taken in the present chapter, a very different approach was taken by Inglehart & Norris (2003), whose study was based on a multi-national survey of values and beliefs. The GES correlated 0.79 with their index (n=16).

Ranking the countries by the GES (emancipation) score puts the five Nordic countries at the top, followed by France and Canada, and Sri Lanka, India, Nigeria and Costa Rica at the bottom (the full ranking of the countries is presented on Appendix E). As this list may suggest, the GES is quite strongly associated with economic development. In fact, it is correlated 0.71 ($p<0.011$) with the income per capita (GDP) across the 29 participating countries (cf. Appendix E). This association should be borne in mind while considering the correlations between the GES and other variables. This correlation may pose some limitations on the analyses of the effects of the GES. We shall try to overcome these limitations using two strategies. First, we shall try to control statistically the effect of economic wellbeing. Second, we shall present the effects of some other background variables, typically associated either with economic prosperity or with women's status, in addition to the effects of the GES.

3.2 Alcohol consumption and its correlates

In order to pursue our first goal (prediction of alcohol consumption) we checked the differences in alcohol consumption, for men and women, across countries. Figure 1 presents the percentage of current drinkers (at least once during the past 12 months) in our sample countries by gender. Countries are ordered by the percentage of male drinkers. A quick glance at the figure reveals several interesting features of the drinking behavior at the 24 countries it presents.

Figure 1. Current drinkers by country and gender



To begin with, the range of the prevalence of current drinkers is rather wide: from 42% to 93% for men and from 6% to 91% for women. This wide range reflects, to some extent, our decision to include several non-western countries in the sample. Thus, inspection of Figure 1 reveals that the 10 countries with the lowest rate of drinkers have a very wide range of male drinkers (from 42% in Nigeria to 84% in the Netherlands, a range of 40%). This part of the graph includes 8 non-European countries. In contrast, the 14 countries with higher rates of drinkers have a narrower range (from Iceland, with 87% to Austria, 93%, a range of 6%). 12 of the 14 countries in this part of the figure are European. Thus, the rates of male drinking suggest that there is some uniformity in the European drinking habits. Thus, the European countries have a higher rate and less variation than the non-European ones.

Another thing that may be observed in Figure 1 is that women's drinking rates are, without exception, lower than men's. Yet, despite the lower drinking rates, the variability of women's rates seems to be far larger than that of men's. Indeed, the standard deviation of the women's rates is 22.9, compared to 15.4 for men (the coefficient of variation is 0.19 for men's rates, 0.35 for women's).

Figure 2. Weekly drinking (% of drinkers) by country and gender

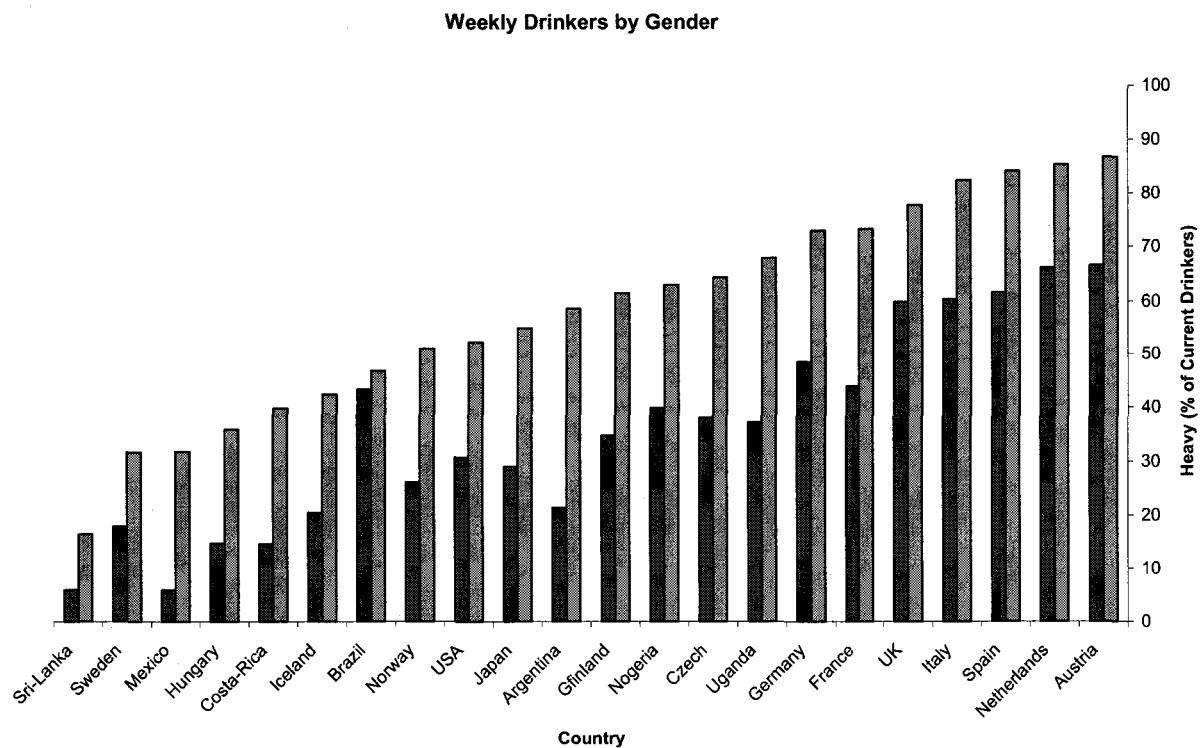


Figure 2 presents weekly drinkers (those drinking at least once a week) as a percentage of all current drinkers. As these figures are computed only for current (past year) drinkers, they are rather independent of the rates of drinking (the correlations are .23 for men, .25 for women). Men's rates of weekly drinking cover the whole range from 16% (Sri Lanka) and 31% (Sweden) to 85% (Netherlands) and 86% (Austria). Women's rates are in all cases lower than men's. The mean of this difference is 22% but there are considerable variations. Thus the difference in weekly drinking is lowest in Brazil (3.4%) and Sri Lanka (10.6%) and it is largest in Uganda and Argentina (30% and 37%, respectively). As Figure 2 shows, the European countries predominate in weekly drinking too (despite its independence from the rate of drinkers). They comprise eight of the highest 10 countries in weekly drinking, and only four of the lowest ten.

Figure 3 presents the rates of heavy drinkers ("heavy" is defined in this context as yearly consumption of more than 8,468 grams of alcohol) as percent of current-year drinkers. The countries are ranked by the percentage among men (note: in Argentina the women's rate is 0). This figure is far less regular than the former two and it presents wide variations in the rates, for men as well as for women. While 13 of the 22 countries present male heavy drinkers rates within the range of 15%-27%, five countries (the Czech Republic, Austria, the UK, Nigeria and Uganda) present considerably higher rates (a more focused analysis suggests that the UK, Nigeria and Uganda are outliers in the males figures, and Nigeria and Uganda among the females).

Figure 3. Heavy drinkers as % of current drinkers (age: 18-34)

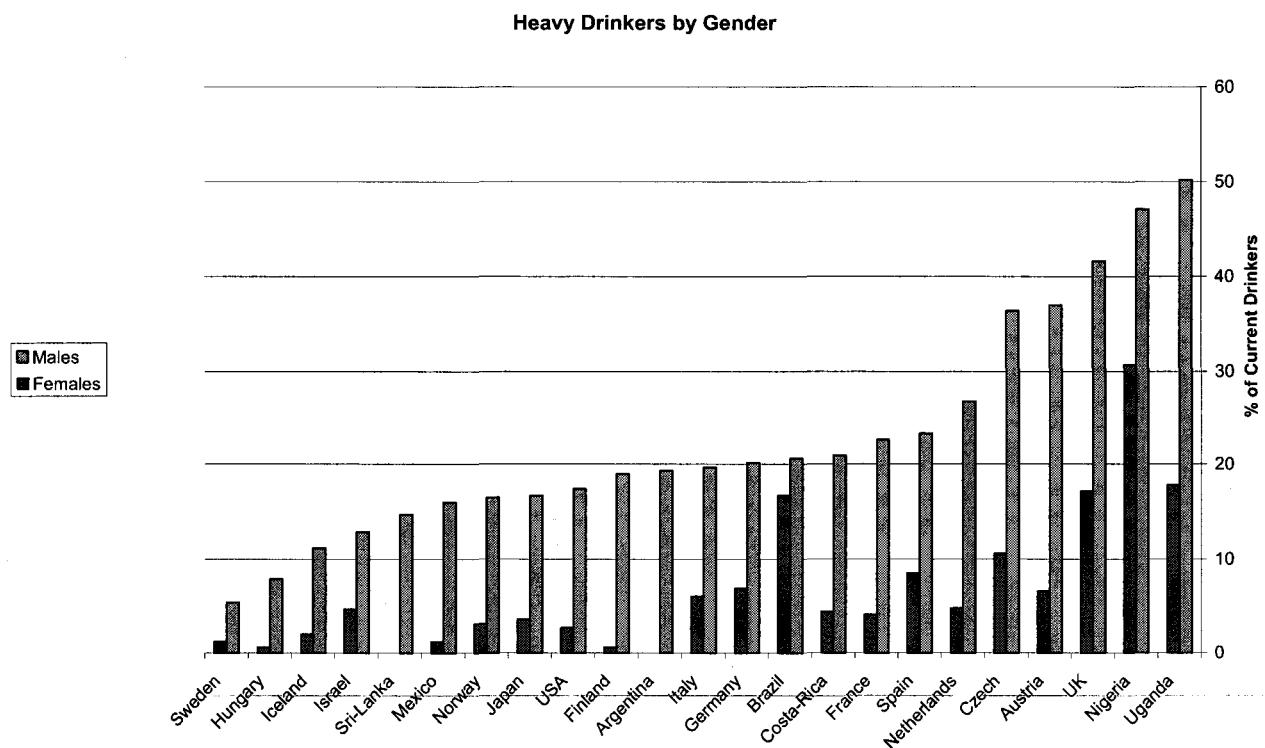


Figure 3 suggests that the difference between men's and women's rates of heavy drinking is positively associated with the rate of men's heavy drinking. That is, the higher the rate of men's heavy drinking, the higher the difference between men's and women's rates. To some extent, this is an artifact of the way the difference is calculated. However, if that was the whole explanation we should expect the men-women difference to be negatively correlated, at a similar magnitude, with the women's rates. This is not the case: the gender gap in heavy drinking correlated 0.81 ($p<0.011$) with the men's rate and 0.30 ($p<0.19$) with the women's. We may therefore conclude that men's heavy drinking affects the gender gap more than women's.

3.3 Country characteristics and per capita alcohol consumption

To address research question 1 on identifying societal-level predictors of men's and women's alcohol consumption, Table 3 presents the correlations between some country characteristics and alcohol consumption. This table is limited to alcohol data available from the Global Alcohol Database (WHO, 2003). The country characteristics used in this table are the GDP per capita, as a measure of a country's economic development, the Human Development Index (HDI) as a more encompassing index of the wellbeing of the population, the extent of urbanization (as in index of modernization), and the proportion enrolled in higher education.

The table shows positive, moderate to high correlations between the total alcohol consumption per capita (15+ years old) and the country's GDP per capita, the country's score on Human Development Index, its rate of urbanization, and the extent of higher education.

Table 3. Country characteristics and alcohol consumption (correlation coefficients, significance, and N's)

	GDP/cap.	HDI	Urban	% in HI-Ed
Alcohol pc 15+	0.44	0.49	0.44	0.30
p<	0.02	0.01	0.02	0.15
N	29	29	29	25
Alcohol in Beer	0.53	0.52	0.48	0.26
p<	0.01	0.01	0.01	0.22
N	29	29	29	25
Alcohol in Wine	0.33	0.38	0.25	0.15
p<	0.08	0.04	0.19	0.48
N	29	29	29	25
Alcohol in Spirits	0.08	0.28	0.24	0.24
p<	0.67	0.15	0.20	0.26
N	29	29	29	25

Note: Coefficients in bold face are significant at the 0.10 level; Alcohol consumption rates are from WHO (1999).

Looking at the table from the alcohol perspective, the correlations are higher and more often significant for total alcohol consumption, and alcohol consumed as beer and wine. They tend to be lower for spirits. That is, beer consumption—and to some extent wine consumption—is more closely associated with economic development than spirits consumption. Looking at it from the country characteristics viewpoint, the correlations are higher for GDP and HDI, somewhat lower for urbanization, and relatively low (and non-significant) for the rate of higher education. These correlations may suggest that alcohol consumption (in the present sample) and particularly beer consumption is associated with economic development and the modern, urban life-style.

**Table 4. Correlations of country characteristics with male and female drinking
(Correlation coefficients, Significance, and N's)**

	Drinkers - Males	Drinkers – Females	Weekly - Males	Weekly - Females	Heavy - Males	Heavy - Females
GDP/cap.	0.72	0.76	0.33	0.33	0.07	-0.18
	0.01	0.01	0.13	0.13	0.78	0.44
	24	24	22	22	21	20
HDI	0.81	0.70	0.14	0.17	0.11	-0.20
	0.01	0.01	0.52	0.45	0.63	0.39
	24	24	22	22	21	20
Gini	-0.69	-0.65	-0.21	-0.11	0.04	0.37
	0.01	0.01	0.37	0.63	0.87	0.14
	22	22	20	20	19	18
Urban	0.61	0.60	0.22	0.23	0.10	0.17
	0.01	0.01	0.33	0.29	0.67	0.48
	24	24	22	22	21	20
Divorce	0.37	0.48	0.01	-0.07	0.17	-0.16
	0.11	0.03	0.99	0.78	0.50	0.52
	20	20	18	18	19	19
Fertility	-0.71	-0.55	-0.03	-0.12	-0.25	-0.14
	0.01	0.01	0.89	0.60	0.27	0.55
	24	24	22	22	21	20
Church	-0.63	-0.76	0.08	0.13	0.15	0.15
	0.01	0.01	0.76	0.62	0.56	0.57
	18	18	18	17	17	17

Note: Boldface indicates significance at the 0.05 level; Weekly drinkers and Heavy drinkers are % of current drinkers. Two outliers were excluded from the heavy drinking correlations

Table 4 presents the correlations between some country characteristics and indicators of male and female drinking (two countries, Uganda and Nigeria, were excluded due to extreme values which distorted the correlation coefficients). The table shows that the prevalence of drinking (current-year drinkers) is quite strongly associated with urbanization, economic development (GDP) and with the Human Development Index (HDI), and moderately correlated with the rate of divorce. It is also associated, although negatively, with religiosity as indicated by the rate of weekly church-going, and with fertility rates. These correlations seem to suggest that the prevalence of drinking is associated with modernization. It is worth noting that the correlation coefficients with the rates of male and female drinking are quite similar.

Two indicators shown in Table 4 which are relevant to the intensity rather than the extent of drinking are the rate of weekly drinkers and the rate of high volume drinking (defined as more than 8,468 grams of pure alcohol per year, which is the equivalent of 1 ounce a day or more). The analysis of weekly drinking and heavy drinking, indicators which are more sensitive to age, the analysis was limited to the 18-34 age group.

Both rates (weekly drinking and high annual volume) are essentially not correlated with the societal indicators: None of the correlations in these columns is significant, and the mean absolute magnitude of the correlations of these variables is 0.16, while the mean correlation in the first two columns of the

table (the rates of current drinkers) is 0.64. Thus, we may conclude that while the rate of current drinking is strongly associated with some key characteristics of the countries, the rates of weekly drinking and heavy drinking among drinkers are not.

Finally, it is interesting to note that the independent variables in Table 4 (the country characteristics) have quite similar correlations with men's and women's drinking variables.

3.4 Country characteristics and alcohol problems

Figure 4 presents the rates of alcohol-related mortality (the sum of the death rates from alcohol dependency, cirrhosis and liver diseases, and alcohol related vehicle crashes) for men and women. Several features of this distribution deserve comment. First, for all the countries in this sample, men's rates exceed those of women, and the differences seem to be relatively large. Second, the differences between men's mortality rates and women's rates vary, and the difference tends to be higher in countries where men's alcohol mortality is higher (in comparison men's rates in other countries). Consequently, the variability in men's rates is considerably higher than that of women's rates. As a result, in some countries (notably Mexico and Hungary) men's rates are several times higher than women's.

Figure 4. Mortality rates of men and women from alcohol-related problems

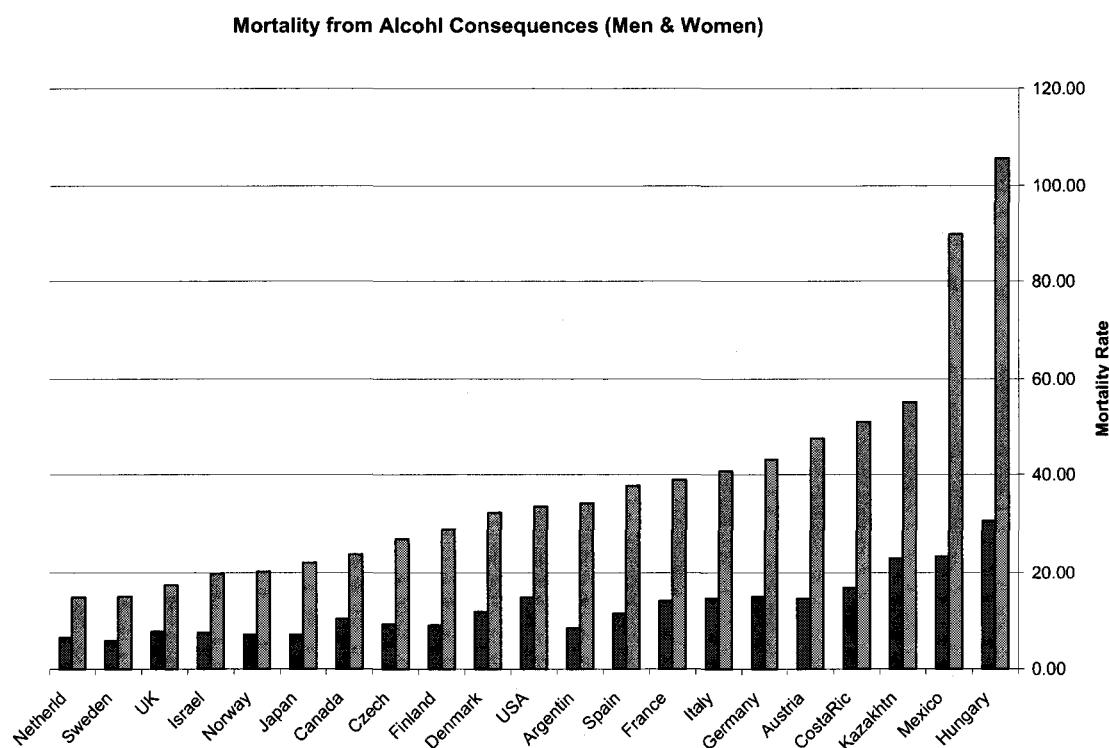


Table 5 presents the correlations between some of the adverse consequences of drinking with selected country characteristics (Gender equity or GES, Gender Empowerment or GEM, GDP per capita, Human Development Index and percent urban). The indicators of consequences are the rates

of death from alcohol dependency, liver diseases and cirrhosis, and motor vehicle crashes, as well as the sum of these death rates. Each of these rates is provided for males and females.

The most visible feature of Table 5 is the predominance of negative correlations: most of the correlation coefficients, and all the significant ones, are negative. This shows that mortality from these alcohol-related factors, in men as well as in women, is negatively associated with the country's standard of living (GDP and HDI), and with rates of urbanization. It is also negatively correlated with the GES (Gender Equity Score) and the GEM. This clear, consistent finding suggests that either the standard of living or modernization, or something associated with these factors, is negatively correlated with alcohol-related mortality. It is interesting to note that mortality from alcohol dependency has only low and mostly non-significant correlations with these factors. This may suggest that diagnosis and coding of death as the result of alcohol dependency may be subject to a large number of factors which may yield considerably biased reports (cf. Dufor & Caces, 1993).

**Table 5. Correlations between Health Effects of Drinking and Country Characteristics
(Correlation coefficients, significance and N)**

	GES	GEM	GDP/cap.	HDI	Urban
Liver disease & cirrhosis, males	-0.47	-0.61	-0.61	-0.65	-0.47
	0.02	0.01	0.01	0.01	0.02
	23	20	23	23	23
Liver disease & cirrhosis, females	-0.49	-0.63	-0.66	-0.72	-0.56
	0.02	0.01	0.01	0.01	0.02
	23	20	23	23	23
Alcohol dependency - males	0.13	0.03	-0.19	-0.25	-0.21
	0.57	0.91	0.41	0.27	0.36
	21	18	21	21	21
Alcohol dependency - females	0.40	0.30	0.05	-0.05	-0.14
	0.07	0.22	0.84	0.82	0.56
	21	18	21	21	21
MV crashes - males	-0.65	-0.56	-0.57	-0.64	-0.45
	0.01	0.02	0.01	0.01	0.03
	24	21	24	24	24
MV crashes - females	-0.24	-0.26	-0.18	-0.35	-0.23
	0.26	0.26	0.40	0.09	0.29
	24	21	24	24	24
Total Alcohol Deaths- Men	-0.51	-0.55	-0.59	-0.65	-0.50
	0.02	0.02	0.02	0.01	0.02
	21	18	21	21	21
Total Alcohol Deaths- Women	-0.45	-0.51	-0.54	-0.66	-0.58
	0.04	0.03	0.01	0.01	0.02
	21	18	21	21	21
Physical aggression by partner: males	0.23	0.41	0.19	-0.16	0.01
	0.46	0.25	0.54	0.59	1.00
	13	10	13	13	13
Physical aggression by partner: females	-0.10	-0.07	-0.25	-0.57	-0.46
	0.76	0.85	0.41	0.04	0.11
	13	10	13	13	13

Note: Coefficients in bold face are significant at the 0.10 level

The rates of physical aggression are less clearly associated with country characteristics, but their direction is interesting too. Women's complaints about partner violence tend to decrease with increasing wealth, urbanization, and gender equity of a country. On the other hand, men's complaints tend to increase with modernization and gender equity.

All five correlations for men with rates of mortality from vehicle crashes are significant, as compared with only one of the correlations for women. This may serve as an indication that the social factors affecting mortality from vehicle crashes affect men more than women. In contrast, men's correlations with the rates of alcohol dependence and liver cirrhosis are very similar to women's.

The Gender Equity Score is correlated well with the three types of health problems. It is negatively correlated with men's and women's mortality from liver cirrhosis and with men's mortality from vehicle crashes, and it is positively correlated women's rate of alcohol dependency.

3.5 Gender inequalities and differences in drinking and consequences

The final sections of this paper address our last research question, namely, the association between gender inequalities and gender ratios in alcohol consumption and alcohol-related problems.

As stated earlier, our major measures of the gender gap are the gender ratios of men's and women's drinking indicators. Four major indicators (and four ratios) were used: (1) percentage of current drinkers, (2) percentage of drinkers who drink at least weekly, (3) percentage of drinkers who drink heavily (more than 8468 grams annually) and (4) percentage of drinkers who engage in heavy episodic drinking (HED, sometimes called "binge drinking") at least once a month. The last three measures are for the 18-34 years old only, and therefore are not affected by differences in the age distributions across societies.

Table 6 presents the gender ratios of the main drinking indicators. The countries in the table are ordered by their gender ratio of current drinkers (from highest to lowest). A glance at the gender ratio for drinkers reveals that the countries in the sample are rather homogeneous in that respect: almost all have a gender ratio between 1 and 2 (and for most countries it is between 1 and 1.4). The only exception is Sri Lanka with a ratio of 8.38. Thus, the overall mean (1.55) is not representative of the distribution. Therefore, a "trimmed mean", without the highest figure is presented too. This reduced the mean gender ratio from 1.55 to 1.25, and reduced the standard deviation of the distribution from 1.47 to 0.23. It is interesting to note that all 8 countries with the highest ratios are non-European. And indeed, if we limit our analysis only to the European countries, the mean gender ratio drops down to 1.14 with a standard deviation of 0.13. In other words, the European countries in our study are very homogeneous with regard to the gender ratio in drinking.

Table 6. Gender ratios of Drinking Indicators

Country	R-Drinkers	R-Week	R-Heavy	R-HED
Sri Lanka	8.38	2.80		3.1
Nigeria	1.89	1.58	1.53	1.96
Mexico	1.72	5.30	13.33	2.56
Costa Rica	1.59	2.73	4.75	3.01
Spain	1.53	1.37	2.74	1.71
Brazil	1.41	1.08	1.23	2.84
Israel	1.36		2.74	4.29
Uganda	1.30	1.82	2.82	2.89
Netherlands	1.23	1.29	5.58	
Hungary	1.21	2.43	13.17	3.94
Argentina	1.20	2.74		1.58
Switzerland	1.19			3.46
Japan	1.18	1.89	4.64	5.31
USA	1.17	1.70	6.44	17.44
Italy	1.17	1.36	3.25	3.92
Czech Rep.	1.13	1.79	3.42	3
Austria	1.13	1.30	5.59	2.64
France	1.12	1.67	5.51	1.96
Sweden	1.12	1.76	4.50	1.14
UK	1.07	1.30	2.43	
Germany	1.04	1.51	3.42	2.68
Iceland	1.03	2.06	5.60	8.27
Norway	1.03	1.95	5.32	1.29
Finland	1.02	1.76	7.58	
Mean	1.55	1.96	5.22	3.76
Mean w/o highest	1.25	1.80	4.60	3.08

Table 7 presents the inter-correlations among these indicators of the gender gap in drinking. In this table two different indicators were used for the percentage of current drinkers: the values derived from the GENACIS surveys, and the values published in the Global Burden of Disease Study (Rehm et al, in press). The table shows high positive correlations between gender ratios in the two indicators of the percentage of current drinkers. There are also high, positive correlations between the three measures of gender differences in drinking frequency and quantity among drinkers. However, the correlations between the gender ratios of the percentage of drinkers and those of the frequency and quantity variables are very low and negative. That is, the gender ratio of the prevalence of drinking is not associated with the gender ratios in its intensity.

Table 7. Intercorrelations among gender ratios in drinking indicators

	R-drinkers (GBD)	R-Drinkers (Genacis)	R-Weekly	R-Heavy	R-HED
R-Drinkers (GBD)	1.00	0.98	0.29	0.01	-0.02
		0.01	0.19	0.96	0.93
		24	22	21	21
R-Drinkers (Genacis)	0.98	1.00	0.27	-0.01	0.02
	0.01		0.23	0.96	0.92
	24		22	21	21
R-Weekly	0.29	0.27	1.00	0.73	0.53
	0.19	0.23		0.01	0.02
	22	22		20	19
R-Heavy	0.01	-0.01	0.73	1.00	0.79
	0.96	0.96	0.01		0.01
	21	21	20		19
R-HED	-0.02	0.02	0.53	0.79	1.00
	0.93	0.92	0.02	0.01	
	21	21	19	19	

Notes: (1) All variables are gender ratios; (2) Significant correlations in bold-face..

Table 8 presents the correlations between country structural characteristics and the gender ratios in alcohol consumption. The gender ratio for the rate of current drinking is negatively correlated with the gross domestic product of a country (GDP), with its Human Development Index (HDI), the extent of urbanization, and the divorce rate. The gender ratio in drinking is positively correlated with the country's inequality of income, the fertility rate, and Hofstede's masculinity index.

In other words, the more a country is urbanized and economically developed, and the less traditional it is, the smaller the difference between men and women in the rate of drinking. This difference, it seems, depends on two factors: modernization and the economic welfare of the population in general, and women's welfare (and their status in society) in particular.

Table 8. Correlations between Gender Differences in Alcohol Consumption and Country Characteristics (Correlation coefficients, Significance, and N's)

	R-Drinkers	R-Drinkers	R-Weekly	R-Heavy	R-HED
GDP/cap.	-0.49	-0.43	-0.36	0.06	-0.12
	0.01	0.03	0.10	0.79	0.61
	29	24	22	21	21
HDI	-0.42	-0.27	-0.14	0.20	0.06
	0.02	0.21	0.54	0.39	0.79
	29	24	22	21	21
Gini	0.13	0.10	0.28	-0.12	0.01
	0.53	0.66	0.23	0.61	0.99
	27	22	20	20	19
Urban	-0.65	-0.55	-0.13	0.01	0.18
	0.01	0.01	0.55	0.95	0.44
	29	24	22	21	21
Divorce	-0.37	-0.57	-0.27	0.06	0.03
	0.08	0.01	0.28	0.80	0.90
	24	20	18	19	18
Hofstede	0.11	0.09	0.16	0.03	0.13
	0.64	0.72	0.57	0.91	0.63
	21	18	16	16	16
No God	-0.31	-0.42	-0.18	0.04	-0.24
	0.17	0.08	0.49	0.90	0.37
	21	18	17	16	16
Church	0.53	0.72	0.31	0.14	0.22
	0.01	0.01	0.23	0.62	0.41
	21	18	17	16	16

Note: Coefficients in bold face are significant at the 0.10 level

Moreover, it seems that the two indicators that reflect beliefs and values (Hofstede's MAS index and the percent who do not believe in God) are far less correlated with the gender difference in current drinking than the structural characteristics of the societies under study.

Table 9 presents the correlations between indicators of the gender gap in drinking and opinions and gender role characteristics in the countries. Results from two multi-national studies were used: The World Values survey, and the International Social Survey Program (ISSP).

While generally these correlations tend to be positive, which might indicate that the gender gap in alcohol tends to be larger in countries characterized by more traditional attitudes and domestic roles, the correlations are mostly low and non-significant.

In other words, the indicators we have concerning public opinion and domestic division of labor in the various countries are not clearly associated with gender ratios in drinking. This reiterates the conclusion from Table 6 that structural societal characteristics may be more important than beliefs and values in their effects upon male-female differences in drinking. However, we must note that many of

the correlations in this table (notably – those dealing with domestic division of labor) are based on a small number of countries.

Table 9. Correlations between Gender Differences in Alcohol Consumption and Public Opinion & Roles (Correlation coefficients, Significance, and N's)

	R-drinkers	R-weekly	R-heavy	R-HED
"A Woman needs a child"	0.35	0.14	0.07	0.04
	0.13	0.58	0.79	0.89
	20	19	18	18
"Child will suffer if mother works"	0.01	0.20	0.10	0.35
	0.95	0.40	0.69	0.17
	19	19	18	17
"Women really want is a home and children"	0.35	0.56	0.49	0.20
	0.24	0.06	0.09	0.55
	13	12	13	11
"Household work is as satisfying as a paid job"	0.06	0.23	0.44	0.49
	0.85	0.47	0.14	0.13
	13	12	13	11
Women always or usually do laundry	0.08	-0.11	-0.05	-0.27
	0.81	0.72	0.86	0.42
	13	12	13	11
Men always or usually do small repairs	-0.21	0.01	0.33	0.16
	0.48	1.00	0.27	0.64
	13	12	13	11
Women always or usually take care of sick	0.14	-0.10	-0.21	-0.03
	0.65	0.75	0.49	0.93
	13	12	13	11
Women always or usually shop for groceries	0.34	-0.05	-0.05	0.17
	0.25	0.89	0.88	0.62
	13	12	13	11

Note: Coefficients in bold face are significant at the 0.10 level

Table 10 presents another approach to the issue. It uses the two summary indices of women's social position. Presumably, these indices, which summarize various indicators, will represent women's social position and its effects on alcohol consumption better than the individual indicators. Table 10 makes use of two indices: the Gender Empowerment Measure (GEM) and the Gender Equity Score (GES). The reader should note that correlations with men's and women's drinking have already been presented above, in Table 4.

Table 10. Correlations between Indices of Women's Social Position and Gender Ratios in Drinking (Correlation coefficients, Significance, and N's)

	R-Drinkers	R-Weekly	R-Heavy	R-HED
GES (Gender Equity)	-0.52	-0.38	0.02	-0.11
	0.01	0.08	0.94	0.65
	24	22	21	21
GEM (Gender Empowerment)	-0.67	-0.46	-0.27	-0.20
	0.01	0.06	0.30	0.47
	19	17	17	16

Table 10 shows that the gender ratio of the annual and weekly prevalence of drinking are strongly associated with women's position in society. That is, the higher the gender equity and gender empowerment, the lower is the gender ratio. The reason is, apparently, the stronger effect that gender equity has on the percentage of female drinkers than on male drinkers: the unstandardized regression coefficients (of the rate of drinkers on gender equity) are 17.5 for men and 24.5 for women. That is, any increase in gender equity is associated with a higher change in women's rate of drinking.

As visual inspection of the pertinent scattergrams suggested that the correlation coefficients of the heavy drinkers' gender ratio were distorted by a couple of extreme cases (Mexico and Hungary), the correlation coefficients for this variable were re-calculated without these countries (a procedure known as trimming). This procedure has actually changed the correlations of the gender ratio of heavy drinkers from low, negative to fairly high, positive and significant correlations (0.56, $p<0.02$ with the GES, 0.53 $p<0.05$ with the GEM). That is, with two exceptions, the higher the gender equity, the higher is the gender ratio for heavy drinking (among the drinkers). This might suggest that in higher gender equity countries, the prevalence of women's drinking is becoming higher and more similar to that of men. However, the rise in the rate of women drinkers is only at the lower end of the frequency and quantity distribution.

Yet another test applied to the correlations in Table 10 was controlling for the GDP per capita. This step was necessary because (as we have noticed) the Gender Equity Scale is strongly correlated with economic prosperity. The partial correlations between the GES and the gender ratio of drinkers (controlling for GDP) was -0.34 ($p<0.12$) and the correlation with the gender ratio of weekly drinking was even lower: -0.19 ($p<0.42$). The two other correlation coefficients, with the gender ratios for heavy drinking and heavy episodic drinking, were even lower. A somewhat different method of controlling for the GDP is presented in Table 13 in the Appendix E. In that table the correlations are presented separately for the higher and lower GDP countries. Here again the only consistent finding is the negative correlation between gender equity and the gender ratio in the prevalence of drinking. As for the gender ratios of weekly drinking, heavy drinking and HED, the correlations are low and inconsistent.

Table 11 presents the correlations between women's social position and the gender ratios for certain drinking consequences. The last column involves gender ratios in the rates of physical aggression. That is, it was based on the rate of men's aggression (as reported by women in GENACIS surveys). Overall, most of the correlations in this table are negative, indicating that as women's position in society is improved, and as there is a higher gender equity, the smaller are the differences between men's and women's alcohol consequences. This is true regardless of the type of indicator used, whether it is based on national-level of death statistics, or on GENACIS surveys (aggressive behavior toward the partner).

The first two rows are for the two global indices of women's position: the Gender Empowerment Measure and the Gender Equity Score. Both are negatively (and quite strongly) correlated with the gender ratios for mortality from liver diseases and motor vehicle crashes. That is, the higher is women's status, or Gender Equity, the smaller is the difference between men's and women's mortality from these causes.

Are these correlations an artifact, based only on the association between the GES and economic affluence? Apparently not -- Partial correlations between the GES and the differences in consequence rates, controlling for the GDP are still mostly negative, although lower. Thus, the correlation between the GES and the gender ratio for alcohol dependency drops from -0.55 to -0.34 (non-significant).

Table 11. Correlations between women's status and gender ratios in health effects of alcohol

	R-Dependency	R-Cirrhosis	R-MV Crash	R-Aggress
GES (Gender Equity)	-0.55	-0.36	-0.80	-0.64
	0.01	0.09	0.01	0.02
	19	23	24	13
GEM (Gender Empowerment)	-0.43	-0.45	-0.63	-0.86
	0.10	0.05	0.01	0.01
	16	20	21	10
Parliament	-0.03	-0.16	-0.36	-0.52
	0.89	0.45	0.09	0.07
	19	23	24	13
Labor Force Participation	-0.72	-0.37	-0.76	-0.43
	0.01	0.08	0.01	0.14
	19	23	24	13
Divorce	-0.67	-0.09	-0.34	-0.53
	0.01	0.70	0.11	0.12
	18	22	23	10

Note: Coefficients in bold face are significant at the 0.10 level.

Women's political involvement (as indicated by parliamentary representation) and labor force participation are correlated with the gender gap in mortality and violence much like the GES: Both are negatively correlated with the gender-difference in cirrhosis and liver diseases and in vehicle crash mortality; and both are positively correlated with the gender difference in partner violence.

4 SUMMARY

To summarize, the following have been found:

- 1) In all the countries in our sample alcohol consumption indicators are higher for men than for women: current drinker rates, the proportion of drinkers who drink weekly and the proportion drinking heavily are all higher for men than for women in each country.
- 2) The extent or prevalence of drinking is consistently associated with the various indicators of modernization. However, modernization is not clearly associated with the intensity of drinking: its frequency and the quantities consumed. Economic development is quite strongly associated with the prevalence of drinkers as well as with the intensity of drinking and with the volume of alcohol consumed (Tables 3, 4).
- 3) Wine-consuming countries tend to consume more alcohol. Beer consumption is strongly associated with the prevalence of current drinkers, while wine consumption is more strongly correlated with the prevalence of weekly drinking (among current drinkers).
- 4) Modernization and economic development are negatively correlated with two variables that serve as indicators of alcohol's adverse effects, mortality from alcohol-related motor vehicle crashes and from cirrhosis and liver diseases, for both women and men (Table 5).
- 5) The gender ratios between men's and women's drinking vary considerably among countries. The gender differences in the prevalence of drinkers are negatively correlated with modernization (Figures 1-3, Table 6). That is, the more modernized a country is, the narrower will be the difference between men's and women's prevalence of drinkers. However, modernization is not clearly associated with the frequency and quantity of drinking.
- 6) One of the strongest findings is that the gender ratio between men's and women's rates of drinking is negatively correlated with women's position within society: the higher women's position, or the more emancipated women are, the smaller the difference between men and women drinking rates (Table 8-10).
- 7) The gender ratio of adverse consequences (mortality from alcohol-related causes and partner aggression) is negatively associated with women's position (Table 11).
- 8) Most of the findings related to gender equity and women's position in society remain valid (although they may be weaker) when the effects of different economic welfare are controlled for.

Finally some words of caution are due. The findings presented above are based on a rather limited group of countries. Our focus on countries within the European Union rendered this sample rather homogeneous in its cultural background, politics, economic situation, etc. It is quite possible that the inclusion of other countries, from other regions, could lead to some other conclusions.

Some of the methodological decisions too may have biased the findings. For instance, it is conceivable that focusing on older age groups (rather than the 18-34 age group) could change some findings.

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