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Cultural and Gender Convergence in Adolescent Drunkenness:

Evidence From 23 European and North American Countries

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Abstract

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Author Contributions: Dr E. Kuntsche had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* E. Kuntsche, S. Kuntsche, Simons-Morton, Hublet, Bendtsen, and Demetrovics. *Acquisition of data:* E. Kuntsche and Simons-Morton. *Analysis and interpretation of data:* E. Kuntsche, S. Kuntsche, Knibbe, Simons-Morton, Farhat, Hublet, Godeau, and Demetrovics. *Drafting of the manuscript:* E. Kuntsche, S. Kuntsche, Simons-Morton, and Demetrovics. *Critical revision of the manuscript for important intellectual content:* E. Kuntsche, S. Kuntsche, Knibbe, Simons-Morton, Farhat, Hublet, Bendtsen, Godeau, and Demetrovics. *Statistical analysis:* E. Kuntsche, S. Kuntsche, Knibbe, and Simons-Morton. *Obtained funding:* E. Kuntsche and Simons-Morton. *Study supervision:* Bendtsen and Demetrovics.

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Additional Contributions: The Health Behaviour in School-Aged Children Study is an international study carried out in collaboration with the Regional Office for Europe, World Health Organization. The international coordinator of the 1997/1998 and 2005/2006 study was Candace Currie, PhD, University of Edinburgh, Edinburgh, Scotland; the data bank manager was Oddrun Samdal, PhD, University of Bergen, Bergen, Norway.

Objective—To investigate time-trend changes in the frequency of drunkenness among European and North American adolescents.

Design—Cross-sectional surveys in the 1997/1998 and 2005/2006 Health Behaviour in School-Aged Children Study (HBSC).

Setting—High schools in 23 countries.

Participants—A sample of 77 586 adolescents aged 15 years was analyzed by means of hierarchical linear modeling.

Main Outcome Measure—The frequency of drunkenness.

Results—We observed a significant increase of about 40% in the mean frequency of drunkenness in all 7 participating Eastern European countries. This increase was evident among both genders, but most consistently among girls. Meanwhile, it declined in 13 of 16 Western countries, about 25% on average. Declines in Western countries were particularly notable among boys and in North America, Scandinavia, the United Kingdom, and Ireland. Despite this gender convergence, with few exceptions (Greenland, Norway, United Kingdom) boys continued to have a higher frequency of drunkenness in 2005/2006 than girls.

Conclusions—The confirmed cultural convergence implies that adoption and implementation of evidence-based measures to mitigate the frequency of adolescent drunkenness such as tax increases and restricting alcohol access and advertisement should get the same priority in Eastern European countries as in Western countries. Policy measures that might facilitate decreases in drunkenness such as server training and the promotion of alcohol-free leisure-time activities should be reinforced in Western countries. The gender convergence implies that prevention policy should be less exclusively focused on male adolescents.

Alcohol Consumption Is one of the major risk factors for morbidity and mortality worldwide.[1] In industrialized countries, drunkenness is more prevalent in adolescence and young adulthood than in any other life period[2] and is a major risk factor for mortality and morbidity in this age group.[3] More specifically, drunkenness has been associated with various adverse consequences and health problems such as fatal and nonfatal injuries, blackouts, suicide attempts, unintended pregnancy, sexually transmitted diseases, academic failure, and violence.[2,4] A responsive public health policy with respect to adolescent drunkenness requires evidence-based information about the change of this behavior over time.[5]

Decades ago, adolescents from Eastern European countries reported lower frequency of drunkenness than their counterparts from Western countries. For example, in one of the first cross-national adolescent health studies conducted in 1985/1986, Hungary was among the countries with the lowest level of drunkenness among 15-year-olds, whereas countries such as the United Kingdom, Finland, and Sweden had the highest level.[6] However, a recent report documented that adolescent drinking is no longer consistently higher in Western compared with Eastern European countries.[7] Data from the European School Survey Project on Alcohol and Drugs (ESPAD)[8] also show that from 1999 to 2007, the prevalence of having had 5 or more drinks on 1 occasion during the last 30 days increased among 15-year-olds in countries such as Bulgaria, Croatia, Czech Republic, and Hungary, while it remained

stable or even decreased in countries such as Finland, Iceland, and Norway. These first indications of a cultural convergence among adolescents are consistent with trends in the adult population. Whereas the per capita consumption of alcohol remained stable or decreased between 1997 and 2003 in Western countries, it increased in Eastern European countries during the same period.[9,10]

There is growing evidence that the dramatic political changes in Eastern European countries during the past 2 decades have contributed to changes in drinking and other lifestyle patterns. Previously, the relatively high social control of leisure-time activities and the relatively low level of alcohol marketing in the planned-economy (socialist) societies in Eastern Europe were thought to explain the lower levels of adolescent drunkenness in Eastern European countries compared with the Western European and North American ones.[11–13]

Following the change of their political system and the opening of their borders, the recreational use of psychoactive substances became a new phenomenon in the early 1990s in the formerly socialist countries in Eastern Europe.[14] Hand in hand with the opening of borders and markets, alcohol marketing spread from Western societies to the formerly planned-economy societies.[15] The observed trend from 1993/1994 to 1997/1998 in adolescent alcohol use has been described as “a geographical pattern in which consumption is increasing in many Eastern and Nordic countries (although stable in Sweden) and decreasing in some Western countries where the consumption rates had been among the highest (Wales, Northern Ireland, and France).”[16] Determining whether the cultural convergence trend in alcohol use that was observed in the 1990s continued into the next millennium is particularly relevant for current prevention efforts.

In addition to the evidence of cultural convergence across countries, evidence of gender convergence among adults within some Western countries has also emerged.[17] In these countries, the prevalence of alcohol use among women has increased and appears to be catching up to that among men,[18,19] possibly owing to changes in gender roles. Notably, during the last 4 decades, gender roles became less distinct as a result of the increasing participation of women in the labor force and the accompanying changes in women’s lives.

However, to our knowledge, no research has examined the hypothesis of gender convergence in adolescent drunkenness in both Eastern and Western countries during the same period. Previously, marked gender differences in adolescent drunkenness have been reported,[20] with boys almost universally more frequently drunk than girls.[7] We expect that these gender differences have become less pronounced in the last decade.

Based on a unique data set of nearly 80 000 adolescents from 23 countries surveyed over 8 years, this study investigates the convergence in the frequency of adolescent drunkenness over time across countries and among subgroups within the countries. In particular, we hypothesize the following with respect to the frequency of drunkenness: (1) it has increased in Eastern European (formerly socialist) countries and remained stable or decreased in Western European and North American countries; and (2) it has increased among girls and remained stable or decreased among boys.

METHODS

STUDY DESIGN

The data used for the analyses were part of the Health Behaviour in School-Aged Children Study (HBSC).[21,22] In collaboration with the World Health Organization, HBSC surveys have been conducted every 4 years since 1983 among adolescents aged 11, 13, and 15 years. Students were selected using a clustered sampling design, where either single classes or schools served as the sampling units.

Across the survey years, data in the HBSC were collected on the basis of anonymous self-report questionnaires distributed in the classroom. In each country, every effort was made to ensure that the international research protocol was followed to guarantee consistency in survey instruments, data collection, and processing procedures. Each participating country obtained approval to conduct the survey from the relevant ethics review board or equivalent regulatory institution. Further information about the survey procedures can be found in the article by Roberts et al[23] and online at http://www.hbsc.org.

SAMPLE

Analyses were restricted to 15-year-olds given that drunkenness is not common in early adolescence. Respondents who did not indicate their sex or answer the question on drunkenness (0.6%) were excluded from the analyses. The final sample consisted of 77 586 adolescents aged 15 years from 23 European and North American countries (51.5% girls; Table 1 has a detailed overview). All response rates were 79% or higher except in Germany, Norway, and the United Kingdom, and they were higher for Eastern European countries than for Western countries.

MEASURES

To test the hypothesis of cultural convergence, all countries participating in the 1997/1998 and 2005/2006 HBSC surveys[21,22] were classified in 2 groups according to the history of their political and economic system (called *East-West* hereafter): Eastern European countries with a formerly planned-economy system and a socialist background vs Western European and North American countries with a marked-economy system (capitalism) and a democratic background.

The outcome measure was the frequency of drunkenness, which was chosen because of its high prevalence during adolescence and its close association to various adverse consequences and health problems.[2,4] The students were asked, “Have you ever had so much alcohol that you were really drunk?” Answer categories were the following: no, never; yes, once; yes, 2 or 3 times; yes, 4 to 10 times; and yes, more than 10 times. Midpoints of categories were used to create a linear measure,[20] with 11.5 occasions used for the upper category (10 times plus half range to midpoint of the adjacent category).

ANALYTICAL STRATEGY

To counteract artificial enhancement in test power due to cluster sampling, the sample was down-weighted by a factor of 1.2, the standard sampling design effect of the HBSC, before

conducting statistical analysis.[24] Differences in the mean frequency of drunkenness between 1997/1998 and 2005/2006 were reported for each country and for the genders separately and were tested by *t* tests. To investigate the gender convergence hypothesis, the frequency of drunkenness was regressed on gender, survey year, and the interaction of both variables. To investigate the convergence of Eastern European countries and Western countries (including North America), the variation in the association between survey year and drunkenness across countries was regressed on the East-West variable described earlier. To approximate a normal distribution and to reduce the effect of extreme values, the outcome variable was log transformed.[25] The multilevel model was estimated using HLM version 6.02 statistical software[26] and was based on robust standard errors, which provide consistent results even with data that do not have a normal distribution.[27]

RESULTS

The mean frequency of drunkenness significantly increased in all 7 participating Eastern European countries, with an overall increase of approximately 40% (Table 2). Significant increases were found for girls in all 7 countries, whereas for boys the increase was significant only in Estonia, Lithuania, and the Russian Federation. In Lithuania, the frequency of drunkenness nearly doubled among both boys and girls, from 1.81 times to 3.91 times among boys and from 1.13 times to 2.80 times among girls.

In contrast, in Western countries an average decrease of approximately 25% in drunkenness was observed across the 16 participating countries. Drunkenness frequency decreased significantly among boys in 8 countries and among girls in 7 countries. The only significant increase was observed among Portuguese girls. Of the 13 countries in which boys initially reported a higher frequency of drunkenness, the decrease in drunkenness was larger among boys than girls in 7 countries (Canada, Denmark, Germany, Greenland, Ireland, United Kingdom, and United States). Of the 3 countries in which girls had the highest frequency in 1997/1998 (Finland, Norway, and Sweden), the decline in drunkenness was larger among girls in 2 countries (Finland and Sweden). While in most countries gender differences generally decreased, gender differences increased in only 2 countries (France and Switzerland) and were relatively stable in only 1 country (Austria). However, despite this notable gender convergence, boys continued to have a higher frequency of drunkenness than girls in 2005/2006, with few exceptions (Greenland, Norway, and United Kingdom).

To test our hypotheses of gender and cultural convergence in drunkenness, we estimated 3 different analytical models (Table 3). Using the total sample of Eastern European and Western countries, model 1 (examining gender convergence) revealed a significant effect of gender and a significant interaction between gender and survey year. Thus, consistent with the hypothesis of gender convergence, the difference in the prevalence of drunkenness between boys and girls declined from 1997/1998 to 2005/2006.

Model 2 (examining cultural convergence) revealed significant effects of survey year, East-West location, and the interaction between East-West location and survey year. Findings suggest that the frequency of drunkenness was generally higher in Western than Eastern countries and declined overall between surveys. The country level equation revealed,

however, that this was only the case in the West. In the 7 participating Eastern European countries, there was an increase.

Model 3 examined both cultural and gender convergence hypotheses in the same analyses, showing significant negative effects for gender and survey year and significant interactions of gender × survey year and East-West location × survey year, consistent with the hypotheses of gender and cultural convergence.

To illustrate the results emerging from the multilevel models, the average frequency of drunkenness among boys and girls from 2 example countries (Latvia and the United Kingdom) were plotted in the Figure. In the United Kingdom, with a high level of drunkenness in 1997/1998, average drunkenness among both boys and girls decreased, whereas in Latvia, characterized by a low level of drunkenness in 1997/1998, average drunkenness for both boys and girls increased. The decrease in the United Kingdom was more pronounced among boys, whereas the increase in Latvia was more pronounced among girls. Across the survey years, boys and girls from both countries had become more similar in terms of drunkenness.

COMMENT

The aim of this study was to test the hypotheses of gender and cultural convergence in drunkenness among adolescents from 23 mostly European and North American countries. The results across countries showed that in 2005/2006, 15-year-old adolescents had on average been drunk 2 to 3 times in their lives. Gender differences, which were well pronounced in 1997/1998, decreased significantly by 2005/2006. In Western countries, the gender convergence was due more to the decrease in drunkenness among boys than among girls.

Results further showed that cultural differences in drunkenness, which were pronounced in 1997/1998, decreased from 1997/1998 to 2005/2006. The decline in cultural differences was due to an increase in drunkenness in Eastern European countries (both genders) and a decrease in Western countries (particularly among boys). Taken together, the findings are consistent with the hypothesis that in the 8-year period of the study, a cultural convergence and a gender convergence in adolescent drunkenness occurred across countries and subgroups within countries, and adolescents became more uniform in drunkenness frequency.

The examination of possible causes of the cultural and gender convergence in drunkenness among adolescents was beyond the scope of this study. However, we speculate that among the possible influences on adolescent drunkenness in Eastern Europe, the most important may be changes in socioeconomic conditions (eg, their transition to market economies) and alcohol advertising and marketing practices. With the opening of borders and markets of the formerly planned-economy societies, Eastern European countries increasingly became confronted with contemporary global alcohol marketing strategies that target particularly young people. According to a World Health Organization report, an estimated 75% of the alcohol industry’s promotional activities are designed to make the product an integral part of

young people's lifestyle.[15] "In this process, the youth market is critical and requires keeping up with the rapidly changing nature of youth subcultures. Successful brands not only attach themselves to the youth subculture, but position themselves to be among its defining features. The marketing of youth-oriented beverages provides a case study in embedding products in young people's lifestyles and daily practices."[15] Facilitated by the breakdown of the high social control of young people's leisure-time activities—which had been mostly organized, funded, and controlled by the governments of the planned-economy socialist societies[11–13]—global marketing appears to have succeeded in increasing excessive alcohol consumption among adolescents in Eastern Europe.

In contrast to the observed increase in drunkenness in Eastern European countries, our study revealed a decrease in adolescent drunkenness in Western European and North American countries, particularly among boys. While alcohol consumption might have appeared to be part of a new and attractive lifestyle element to adolescents in Eastern Europe, during the same period alcohol consumption and drunkenness may have lost some of their appeal to a formerly high-consuming group, ie, mostly boys in Western Europe and North America. In these areas, the omnipresence of alcohol marketing may have saturated the market, making adolescents more likely to consider the prevailing ways of alcohol consumption as conformist and traditional rather than innovative. Demant and Törrönen,[28] for example, reported a decreasing popularity of drinking to intoxication in Northwestern Europe and an increasing popularity of so-called playful (moderate) drinking. This trend might have been facilitated by policies that restrict marketing and access and by the increasing development and implementation of evidence-based prevention programs targeting adolescent substance use in North America and Western Europe.[5] For example, drinking and driving among adults and youths has declined dramatically in North America in the past decade owing to policy attention to this issue as well as public education campaigns.[29] While it would be important for national governments to consider policy changes, the European Union and the World Health Organization could also guide and support national policy initiatives. For example, they could facilitate exchanges of best practices for reducing adolescent drunkenness between countries that have successfully implemented them and countries that need them.

One of the strengths of the study is the large cross-national sample, which allowed testing of the cultural and gender convergence hypotheses in the participating 23 countries. However, the data were collected from cross-sectional samples and all countries are located in Europe or North America, limiting causal inference and generalization. Much remains to be learned about the nature of gender and cultural convergence in these countries and in the rest of the world.

As an outcome variable, only the frequency of drunkenness among 15-year-olds was included as an indicator of heavy episodic drinking. Consequently, our results should be confirmed in studies using other measures of alcohol outcomes. In addition, our measure of drunkenness is less precise than would be desired and could suffer to some extent from variability in respondent interpretation.

Further, our study relied on self-reports. Although anonymous school-based surveys provide valuable information and the accuracy of the different language versions of the present survey had been guaranteed by back-translations, it is possible that some questions may have been interpreted variably by students in different countries or from one period to the next. Finally, our time frame was the 8-year period from 1997/1998 to 2005/2006, and caution should be exercised in extending these conclusions to periods before or after this time span.

CONCLUSIONS

Our findings are consistent with the hypotheses of convergence in the past decade in adolescent drunkenness across cultures and gender groups. This convergence was due mainly to a decrease in drunkenness in formerly high-consuming groups (mostly boys in Western countries) and an increase in drunkenness in Eastern Europe (formerly low-consuming countries). In terms of prevention policy, the cultural convergence implies that adoption and implementation of evidence-based measures to reduce adolescent drunkenness should have at least as high a priority in Eastern European countries as in Western countries. However, it may be particularly useful for Eastern European countries to emphasize measures most likely to discourage drunkenness. Examples of such policy measures include tax increases, restricting alcohol advertisement, and limiting the number and opening hours of alcohol outlets. In contrast, in Western European countries, it may be timely to place greater emphasis on measures most likely to facilitate decreases in drinking and drunkenness. Examples of such policies include server training to (further) discourage drunkenness within drinking situations and promoting leisure time in which activities other than drinking are central. The gender convergence implies that prevention policy should be less exclusively focused on male adolescents.

Future research should strive to investigate the reasons behind the cultural convergence in the frequency of adolescent drunkenness such as the relative effects of changes in alcohol marketing or policy on adolescent alcohol use, including drunkenness, in different geographical and political regions. These investigations could be achieved by means of natural experiment studies.

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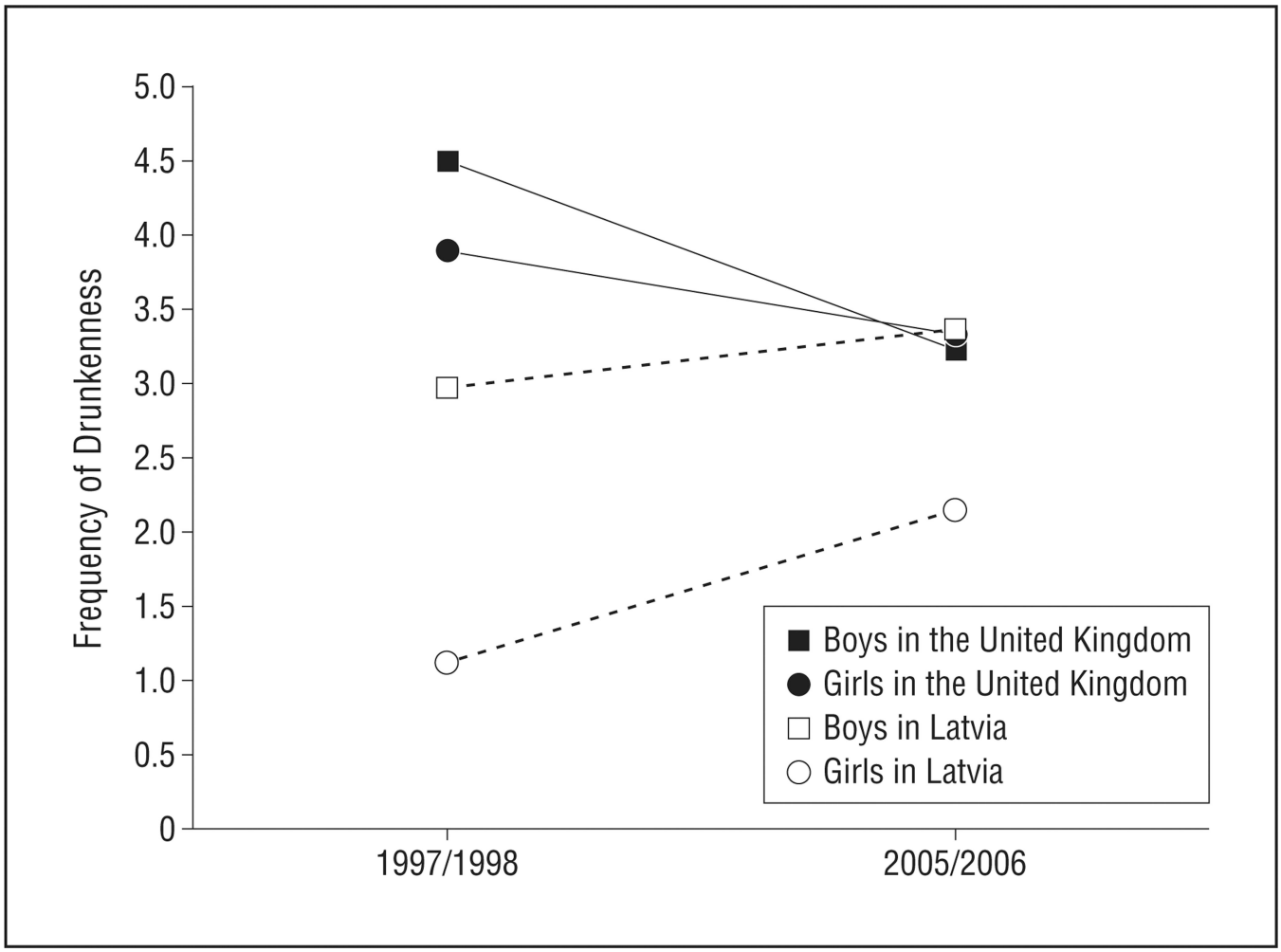

Figure.
Frequency of drunkenness among boys and girls from Latvia and the United Kingdom in 1997/1998 and 2005/2006.

Table 1

Final Sample Sizes and Response Rates[a]

	Boys, No.		Girls, No.		
Country	**1997/1998**	**2005/2006**	**1997/1998**	**2005/2006**	**Response Rate, %**
Eastern European					
Czech Republic	583	834	596	821	100.0
Estonia	250	798	335	783	100.0
Hungary	242	547	314	634	98.1
Latvia	443	627	682	701	98.1
Lithuania	624	933	771	921	100.0
Poland	866	1089	724	1192	100.0
Russian Federation	597	1227	675	1500	82.2
Total	2739	4966	3373	5360	96.9
Western					
Austria	574	782	713	970	87.7
Belgium	792	1548	759	1459	97.3
Canada	1132	1069	1268	1183	92.3
Denmark	627	752	704	785	94.4
Finland	721	788	741	893	89.4
France	587	1133	645	1082	79.1
Germany	763	1256	760	1278	46.7
Greece	585	644	698	760	96.3
Greenland	173	203	172	207	NA
Ireland	1298	904	1215	765	98.9
Norway	836	810	811	712	68.4
Portugal	373	607	557	766	100.0
Sweden	595	749	533	773	90.2
Switzerland	914	727	911	764	85.7
United Kingdom	2259	2469	2436	2499	66.3
United States	691	631	845	621	99.1
Total	13 786	16 161	14 492	16 709	80.7

Abbreviation: NA, not available.

[a]France, Germany, and the Russian Federation were represented by regions; all other countries were represented by national samples. In the 1997/1998 survey, Belgium was represented only by the French-speaking part. Response rates were calculated by dividing the number of participating classes or schools by the number of selected classes or schools and were consistently available for the 2005/2006 survey only.

Table 2

Mean Frequency of Drunkenness Among 15-Year-Olds in 1997/1998 and 2005/2006 According to Gender and Country[a]

	Boys, Mean Frequency			Girls, Mean Frequency		
Country	**1997/1998**	**2005/2006**	**Change**	**1997/1998**	**2005/2006**	**Change**
Eastern European						
Czech Republic	2.12	2.30	+0.18	1.07	1.79	+0.72[b]
Estonia	2.93	4.06	+1.12[b]	1.28	2.38	+1.11[b]
Hungary	2.48	2.80	+0.32	1.07	1.91	+0.84[b]
Latvia	2.97	3.35	+0.38	1.13	2.15	+1.02[b]
Lithuania	1.81	3.91	+2.10[b]	1.13	2.80	+1.67[b]
Poland	2.50	2.84	+0.34	1.10	1.51	+0.41[c]
Russian Federation	1.85	2.57	+0.72[b]	1.40	1.79	+0.39c
Total	2.23	3.14	+0.90[b]	1.18	2.11	+0.93[b]
Western						
Austria	3.31	2.99	−0.32	2.42	2.12	−0.30
Belgium	2.00	2.11	+0.11	1.04	1.25	+0.21
Canada	3.18	2.41	−0.77[b]	2.93	2.26	−0.67[b]
Denmark	5.54	4.41	−1.13[b]	4.76	3.89	−0.88[b]
Finland	3.77	3.48	−0.29	3.96	3.03	−0.94[b]
France	1.79	1.85	+0.07	1.11	0.99	−0.11
Germany	2.45	2.10	−0.35	1.74	1.62	−0.12
Greece	1.39	1.32	−0.07	1.08	0.88	−0.19
Greenland	3.60	2.54	−1.06[d]	3.36	2.85	−0.51
Ireland	3.69	2.58	−1.11[b]	2.42	2.10	−0.32
Norway	2.62	1.76	−0.86[b]	2.81	2.05	−0.77[b]
Portugal	1.64	1.44	−0.20	0.63	0.94	+0.31[c]
Sweden	2.72	1.86	−0.86[b]	2.78	1.75	−1.03[b]
Switzerland	1.69	1.93	+0.24	0.95	1.08	+0.14

	Boys, Mean Frequency			Girls, Mean Frequency		
Country	**1997/1998**	**2005/2006**	**Change**	**1997/1998**	**2005/2006**	**Change**
United Kingdom	4.49	3.22	−1.27[b]	3.91	3.33	−0.58[b]
United States	2.60	1.39	−1.21[b]	1.97	1.29	−0.67[b]
Total	3.08	2.46	−0.63[b]	2.46	2.01	−0.46[b]

[a] Standard errors and other statistics are available on request.

[b] $P<.001$ by *t* test performed on the down-weighted sample (see “Methods”).

[c] $P<.01$ by *t* test performed on the down-weighted sample (see “Methods”).

[d] $P<.05$ by *t* test performed on the down-weighted sample (see “Methods”).

Table 3

Gender, Country, and Survey Year as Determinants of Drunkenness[a]

Variable	Regression Coefficient of Multilevel Model (SE; *t* Ratio)		
	Model 1, Gender Convergence	Model 2, Cultural Convergence	Model 3, Full Model
Gender, β_{1j}	−0.18 (0.03; −5.5)[b]	NC[c]	−0.17 (0.03; −5.5)[b]
Survey year, β_{2j}	−0.05 (0.04; −1.2)	−0.11 (0.03; −3.9)[b]	−0.11 (0.03; 4.1)[b]
Gender × survey year, β_{3j}	0.06 (0.02; 2.7)[d]	NC[c]	0.06 (0.02; 2.7)[d]
East-West location, γ_{01}	NC[c]	−0.19 (0.07; −2.6)[d]	−0.04 (0.08; −0.6)
East-West location × survey year, γ_{21}	NC[c]	0.36 (0.06; 5.6)[b]	0.25 (0.06; 4.4)[b]

Abbreviation: NC, not calculated.

[a] Regression coefficients of the multilevel models are given, and standard errors and *t* ratios are shown in parentheses. Gender was coded 0 for boys and 1 for girls; East-West location was coded 0 for Western European and North American countries and 1 for Eastern European countries. The dependent variable was the logarithm of drunkenness (see “Methods”).

[b] $P<.001$.

[c] Not included in the model.

[d] $P<.01$.