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DOCTORAL (PH.D.) THESIS BOOKLET

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**The role of motivational components of alcohol use among youth in
different settings and cultures**

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1 Aims¹

The aims of my dissertation was to investigate the validity and applicability of the four-dimensional structure of drinking motives and the analysis of the association between drinking motives and indicators of alcohol use. As no studies have been carried out about the motivational background of alcohol use in Hungary so far, my dissertation aimed to contribute to the substantiation of research on drinking motives in Hungary.

The research was built on the concept that understanding motives is crucial to identify the groups of people at risk in terms of alcohol use (Cox and Klinger, 1990; Cooper, 1994, Kuntsche et al., 2005). Investigating risky drinking is of outstanding importance because epidemiological studies in Hungary reported about an increasing prevalence of frequent drinkers and binge drinkers in the last years (Elekes, 2009; Pikó, 2010).

Research on the background of alcohol use had been dominated by alcohol expectancies for a long time (Baer, 2002; Kuntsche et al., 2007,) and an increasing interest in drinking motives could be observed only in the last two decades. Latest results show that drinking motives are the most proximal factors for engaging in drinking and motives drinking motives are the final pathway to alcohol use, i.e. the gateway through which more distal influences, such as alcohol expectancies, are mediated (Cooper et al., 1995; Kuntsche et al., 2005, 2006, 2007; Urbán, Kőkőnyei and Demetrovics, 2008). Results revealed also that drinking motives explain up to 50% of the variance in adolescent alcohol use (Kuntsche, 2007) and consequently they are strong predictors of alcohol related problems and binge drinking (Kuntsche et al., 2006).

Studies of my dissertation fit into this research paradigm. My dissertation focuses particularly on the questions how different cultures and settings influence on drinking motives and what kind of effect they have upon the association between drinking motives and certain alcohol indicators. Previous research has been conducted mainly in the U.S and in Switzerland, using the sample of high school and college students. Consequently, there is a lack of information about drinking motives of young adults; we do not have information about the characteristics of drinking motives in Central and Eastern Europe; we do not know how drinking motives of young people belonging to a specific subcultures or attending special settings (e.g. recreational setting) differ from those of the general population.

If drinking motives predict alcohol related outcomes (e.g. drunkenness, binge drinking, alcohol-problems) also in different cultures and settings, it will have important implications for prevention. Given the high prevalence of problematic and risky drinking among Hungarian high school and university students (Sebestyén and Németh, 2007; Elekes, 2009; Pikó, 2010), research on drinking motives is essential in developing effective prevention strategies and early treatment programs (Kuntsche et al., 2006). Furthermore, investigating drinking motives of party and festival goers is of strategic importance as the recreational scene has been characterized by much higher levels of alcohol and drug use than found in the general population and they are considered to be especially vulnerable (Demetrovics, 2009). If the measures of drinking motives (Cooper, 1994; Kuntsche and Kuntsche, 2009) proved to be applicable and useful, studying maladaptive drinking motives in this particularly vulnerable population would be possible and accessible. Moreover, the intercultural comparison of drinking motives is also an important pillar in developing prevention programs. These results are not only fundamental in revealing cultural characteristics in drinking motives but also in adapting prevention programs targeting risky drinking motives at international level.

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2 Theoretical background

Drinking motives represent a new focus in alcohol research. At the beginning of the research of drinking motives, in the 1960s, reasons for drinking – which these studies identified – were then classified into two broad categories: motives to escape or to cope with personal problems or negative emotional state, and motives to celebrate, to enjoy or to be social (Cooper et al., 1992; Stewart, Zeitlin and Samoluk, 1996; Kuntsche, 2007). In the forthcoming 40 years around 25 scales were developed measuring directly or indirectly the causes, reasons and motives of drinking. However, the measurement of motives was found to be highly heterogeneous (Kuntsche et al., 2005). The items developed without a comprehensive theoretical framework were grouped into between 2 and 10 dimensions and sometimes the same items occurred in several dimensions (Cooper et al., 1992; Kuntsche et al., 2005).

In this context the development of the theory of Cox and Klinger (1988, 1990) is considered as a milestone. In the Motivational Model, Cox and Klinger (1988, 1990) laid down the theoretical framework of drinking motives research. The concept of the Model is based on the assumption that people drink in order to attain certain valued outcomes and persons make a conscious or unconscious (automated) decisions to drink or not to drink. The decision is a combination of emotional and rational processes in that the decision is made on the basis of the affective change that the person expects to achieve by drinking compared with not drinking. According to the Model (Cox and Klinger, 1990) individuals drink to obtain positive outcomes or avoid negative ones. In addition, they can be motivated by internal rewards, such as the enhancement of a desired emotional state or by external rewards, such as social approval.

In the light of these considerations, Cooper and her colleagues (1992) developed a theory-based quantitative measure to assess drinking motives. The principal aim was to facilitate the inclusion of drinking motives in surveys and counseling situations where space and administration time are at a premium. The first questionnaire (Drinking Motives Questionnaire, DMQ, Cooper et al., 1992) included only three factors: social, coping and enhancement motives. The validity and reliability of the 21-items scale was confirmed in sample with different ethnical backgrounds and age groups. However, to fit more precisely the theoretical considerations of Cox and Klinger (1990) Cooper (1994) revised the questionnaire (Drinking Motives Questionnaire Revised, DMQ-R) and added another motive to the existing three. By introducing conformity motive, the DMQ-R was based exactly on the crossing of the two dimensions of Cox and Klinger (1990): enhancement, coping, social and conformity (Table 1).

	Positive outcomes	Negative outcomes
External rewards	SOCIAL	CONFORMITY
Internal rewards	ENHANCEMENT	COPING

Table 1: The four factors of drinking motives according to Cox and Klinger (1990) and Cooper (1994)

According to Cooper (1994) the four motives can be described as follows:

- (1) Enhancement (internal, positive) motives describe the phenomenon when people drink in order to have fun, to enhance the affect caused by alcohol and to experience euphoria.
- (2) Social (external/positive) motives focus also on positive experience, however it is anticipated in a social context. Social motives refer to the cheering up of social gatherings, parties and celebrations.
- (3) Conformity (external/negative) motives aim to avoid unpleasant social situations (e.g. rejection by a valued group) and to obtain social rewards. This is the typical situation is of 'drinking in order not to be an outsider'.
- (4) Coping (internal/negative) motives aim to avoid the negative, internal affects (anxiety, tensions, distraction, bad mood etc.). In this case people drink not to search for particularly positive mood but to keep away from negative internal states.

The validation study of Cooper (1994) confirmed the four-factor model and the confirmatory factor analysis (CFA) indicated a better model fit compared to the two- and three-factor models. Results remained invariant while controlling for ethnicity, age and gender.

The DMQ-R consists of 20 items and the four motives are measured by five items respectively. Each item is rated on a five-point relative frequency scale ranging from never to almost always (1=never/almost never, 2=sometimes, 3=about half of the time, 4=often, 5=always/almost always) based on the instruction 'In the last 12 months how often did you alcohol because ...'. DMQ-R is the most widely used measure of drinking motivation (Kuntsche et al., 2005). In order to use the questionnaire more easily and rapidly Kuntsche and Kuntsche (2009) developed the short form of the questionnaire consisting of 12 items where each motive is measured by three items respectively (Drinking Motives Questionnaire Revised Short Form, DMQ-R-SF). In this questionnaire the frequency scale was reduced to a three possible replies ranging from never to almost always (1=never, 2=sometimes, 3=almost always). The measurement properties of the DMQ-R-SF in terms of model fit, item loadings, and internal consistencies were as good as (if not better than) the original DMQ-R (Kuntsche and Kuntsche, 2009).

Research indicated the particularly high risk of internal motives (enhancement and coping motives) with respect to alcohol use (Kuntsche et al., 2006; Németh et al., 2011a, 2011b, 2011c; Urbán et al., 2011). Enhancement motives are associated with heavy drinking and coping motives are related to problem-behavior. In contrast to that social and conformity motives are associated with moderate drinking (Cooper et al., 1995; Kuntsche et al., 2005). The high risk associated with internally generated motives is reasonable because external motives are not associated with tension relief and coping, and they are greatly influenced by (eventually changing) social factors (Cooper, 1994).

Concerning the importance of motives data shows consistently that most adolescents reported drinking for social motives (Kuntsche et al., 2006). Social motives are followed by enhancement motives, then by coping and conformity motives in that order. However, determinants such as gender, age, personality, culture and situation might influence the mean level of motives and the association of motives with certain alcohol outcomes (e.g. drunkenness, binge drinking, alcohol-related problems) (Kuntsche et al., 2006; Németh et al., 2011a, 2011b, 2011c; Urbán et al., 2011).

There are substantial differences in motives in terms of gender and age. While adolescent boys score higher on enhancement and social motives, girls endorse more coping motives. However, in college students more coping drinkers are found among males (Kuntsche et al., 2006; Kuntsche, 2007). Nevertheless, the rate of social drinkers increases by age (Kuntsche et al., 2006). Longitudinal studies are of great need to better understand the role of gender and age. They could reveal to what degree the development of gender differences in drinking motives are responsible for the development of gender differences in alcohol use patterns during adolescence and early adulthood. However, so far only very few and methodologically heterogeneous longitudinal studies have been conducted (Armeli et al., 2010; Schelleman-Offermans, Kuntsche and Knibbe, 2010; Littlefield, Sher and Wood, 2010).

The link between drinking motives and personality has been examined in many studies (see for review Kuntsche et al., 2006). Results indicate two distinct groups of risky drinkers among adolescents. First, those who drink for enhancement motives were shown to be extraverted, impulsive, and aggressive. They tend to be sensation seekers, to have low inhibitory control, low levels of responsibility and a weak will to achieve. Second, those who drink for coping motives were shown to be neurotic and to have a low level of agreeableness and a negative view of the own self. (Loukas et al. 2000; Theakston et al; 2004, Stewart and Devine, 2000, Stewart et al., 2001).

Only a few empirical studies have investigated cultural differences in drinking motives (Nagoshi et al., 1994; Gire, 2002; Pikó, Wills and Walker, 2007; Kuntsche, Stewart and Cooper, 2008, Németh et al., 2011b). Based on their results we can conclude that the factor structure of DMQ-R is stable and invariant, but the importance of certain motives may vary according to the cultural context (Kuntsche et al., 2006; Németh et al., 2011b).

3 The structure and hypotheses of the studies

Based on the theoretical framework and previous studies the aims of the studies of the dissertation were as follows:

- (1) to develop the Hungarian version of the Drinking Motives Questionnaire Revised (DMQ-R-HU) and the Drinking Motives Questionnaire Revised Short Form (DMQ-R-SF-HU) and to test the measurement properties of these questionnaires.
- (2) to investigate the validity, reliability and applicability of the four-dimensional structure of drinking motives in an older and more heterogeneous sample because previous studies focused almost exclusively on adolescents.
- (3) to assess and analyze the drinking motives of the visitors of a special, recreational scene.
- (4) to examine the cultural characteristics of drinking motives and to conduct an intercultural comparison between two countries.

Built on these aims three studies were conducted.

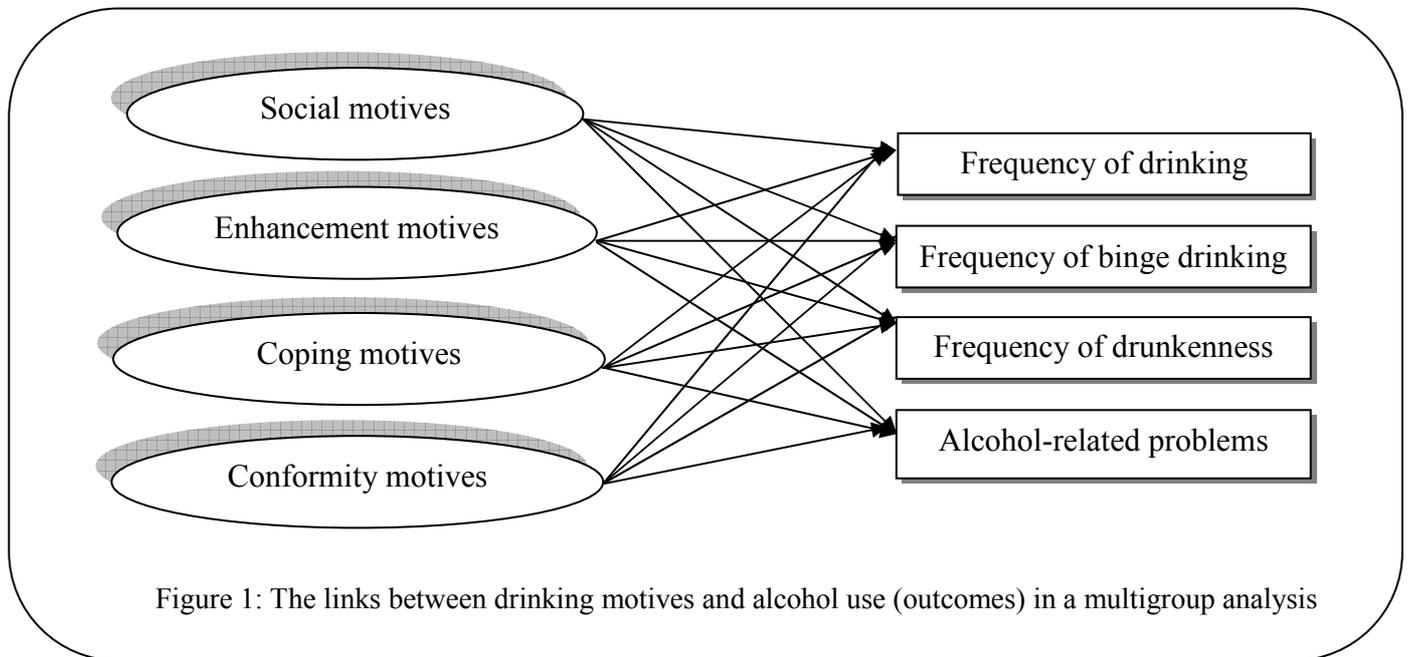
- I. In the first study the Drinking Motives Questionnaire Revised (DMQ-R-HU) and the Drinking Motives Questionnaire Revised Short Form (DMQ-R-SF-HU) were validated in an adolescent and a college student sample. Besides the adaptation of the questionnaire, the psychometric properties, construct validity and model fit indices of the long and short versions were compared.
- II. In the second study, in a recreational context specifically the short version (DMQ-R-SF-HU) was tested. Studying the recreational scene (festival) is of outstanding importance for two reasons. First, the clubbing scene is characterized by a higher alcohol and drug prevalence (Demetrovics, 2009). Thus this scene provides a good opportunity to assess the motivational background of hazardous drinking. Second, previous research has not examined special samples in the non-traditional scene and beyond institutional frames.
- III. The third study dealt with cultural differences in drinking motives. Based on a Spanish and Hungarian sample I analyzed that in two very different drinking cultures how specific the drinking motives and their links to alcohol use are. Like in the second study, only the short questionnaire (DMQ-R-SF-HU) was used also in this study, in particular because it has not been applied for intercultural comparison before.

In the light of earlier studies and clinical observations the following set of hypotheses was proposed:

- a. Both the Hungarian version of the Drinking Motives Questionnaire Revised (DMQ-R-HU) and the Drinking Motives Questionnaire Revised Short Form (DMQ-R-SF-HU) can be applied as well in the Hungarian study as in international research in terms of psychometric properties and construct validity. Model fit indices of the DMQ-R-SF-HU are as good as in the case of DMQ-R-HU (if not better).
- b. Similar to previous international studies, in the Hungarian sample enhancement and coping motives predict the frequency of drunkenness and binge drinking. In older samples (young adults) the role of internally generated motives is more important. While among adolescents externally generated motives (e.g. conformity motives) predict risky drinking, among college students enhancement and coping motives are decisive.
- c. In a recreational setting with an older and more heterogeneous sample the DMQ-R-SF-HU can be applied well, the model fit indices are good and four-dimensional factor structure is invariant.
- d. In the recreational sample frequency of drinking is predicted not only by enhancement motives but also by social motives due to the social characteristics of the event. Alcohol-related problems are predicted by coping motives.

- e. The rank order of motives is the same between Hungarian and Spanish students, though the mean level of motives of the Hungarians is higher due to the high alcohol use prevalence in international comparison.
- f. The link between drinking motives and outcomes related to alcohol use (e.g. binge drinking) is invariant between the Hungarian and Spanish culture.

In all three studies the link of drinking motives with alcohol use was assessed in a multigroup analysis. Figure 1 shows the graphical presentation of the multigroup analysis.



4 Studies

4.1 Study 1

4.1.1 Sample

Adolescents: 986 students participated in the study, 34 subjects (3.4%) of those were dropped due to high number of missing values (20% or more) or inconsistencies. Since drinking motives can be analyzed only among drinkers, participants who did not indicate at least one drinking occasion in the last 12 months (n=30, 3.1%) were excluded. The final sample was composed of 922 high-school students (mean age = 16.6 years, SD=1.44 years, age range 14-20; 362 boys and 591 girls). The higher proportion of girls in this sample is in accordance with gender distribution in general high schools in Hungary (Hungarian Ministry of Education and Culture, 2006).

College students: 1255 students from various faculties at the Eötvös Loránd University of Science in Budapest were asked via e-mail to fill out an online questionnaire on alcohol use, in case they drank alcohol at least once during the last 12 months. A total of 529 students (317 men, 212 women) have started to fill out the questionnaire resulting in a response rate of 42.2% which is similar to those of other web-based alcohol research studies among college students (Kuntsche, Von Fischer, & Gmel, 2008). Out of the 529 students 346 (193 males and 153 females; 65.4%) have completed the entire questionnaire. Mean age of the subjects in the final sample was 21.6 years (SD=2.61 years), age range 18-30.

4.1.2 Measures

Besides using the Drinking Motives Questionnaire Revised (DMQ-R-HU) and the Drinking Motives Questionnaire Revised Short Form (DMQ-R-SF-HU) respondents were asked about the frequency of drinking and drunkenness (in the last 12 months respectively). Frequency of binge drinking (5 or more drinks in one occasion) was also assessed by measuring the monthly prevalence among adolescents and the yearly prevalence among university students.

4.1.3 Key results and discussion

Results in both samples confirmed the four-dimensional structure of drinking motives. While the model fit of the DMQ-R-HU was not entirely adequate, the indices of the confirmatory factor analysis of the DMQ-R-SF-HU proved to be good. Moreover, the explained variance of drinking motives concerning alcohol use was also higher compared to the long questionnaire.

As Table 2 shows the rank order of drinking motives was the same in the two samples, in line with previous studies (Kuntsche and Kuntsche, 2009; Mazzardis et al., 2010). Adolescent boys scored significantly higher on social motives suggesting that drinking with peers is more common among boys than among girls in this age group. The comparison of mean levels of motives between adolescents and college students revealed that the younger ones endorse significantly more coping and conformity motives. On the one hand this indicates that high school students experience greater pressure to drink than the older ones. On the other hand results suggest that coping with difficulties in school and family represent a crucial problem for adolescents.

	Adolescents	College students
Mean level of drinking motives (standard deviation, SD)*		
Social	2.62 ^a (1.43)	2.65 ^a (1.37)
Enhancement	1.79 ^a (1.27)	1.80 ^a (1.15)
Coping	1.48 ^a (1.30)	1.31 ^b (1.25)
Conformity	0.76 ^a (0.94)	0.56 ^b (0.73)
Mean levels according to gender (SD)*		
Males		
Social	2.81 ^a (1.38)	2.62 ^a (1.38)
Enhancement	1.92 ^b (1.31)	1.75 ^a (1.15)
Coping	1.41 ^a (1.30)	1.14 ^a (1.22)
Conformity	0.91 ^b (1.05)	0.50 ^b (0.66)
Females		
Social	2.58 ^a (1.43)	2.68 ^a (1.38)
Enhancement	1.77 ^b (1.23)	1.86 ^a (1.16)
Coping	1.55 ^a (1.30)	1.52 ^a (1.23)
Conformity	0.68 ^b (0.85)	0.63 ^b (0.80)

Table 2: Mean level of drinking motives and gender differences in Study 1

* Collapsed across motive dimensions; post hoc test for group differences (t-test, significant at the 5% error level): a < b.

Confirmatory factor analysis of the original version of DMQ-R revealed less adequate fit in multigroup analysis ($\chi^2_{\text{adolescents}}=1598$; $\chi^2_{\text{young adults}}=1057$; $df=360$; $CFI=.797$; $TLI=.786$; $RMSEA=.100$ [.097-.104]; $SRMR=.104$). In another multigroup analysis, we tested the freely estimated structure of the short version of DMQ-R, the fit indices indicated adequate fit: $\chi^2_{\text{adolescents}}=208$; $\chi^2_{\text{young adults}}=260$; $df=112$; $CFI=.941$; $TLI=.930$; $RMSEA=.071$ [.064-.078]; $SRMR=.055$.

To assess the link between drinking motives as latent variables and frequency of alcohol use, drunkenness and risky drinking, multivariate structural equation modeling (SEM) was performed. The freely estimated structure revealed an adequate fit in both groups ($\chi^2_{\text{adolescents}}=249$; $df=88$

CFI=.97; TLI=.96; RMSEA=.045 [.038-.051] SRMR=.031; and $\chi^2_{\text{young adults}}=267$; df=88 CFI=.92; TLI=.87; RMSEA=.077 [.067-.088]; SRMR=.052).

Consistent with previous studies (Kuntsche et al., 2005, 2006) internally generated enhancement motives predicted the frequency of drinking and drunkenness among college students (Table 3). However, in contrast to that, results showed a diversified pattern of results among adolescents. In the younger sample social and conformity motives predicted the frequency of drinking, and enhancement and conformity motives predicted the frequency of drunkenness. This implies that it depends heavily on the peer group how often teenagers drink. However, drunkenness is influenced also by internal sources. Contrary to the expected results, social motives predicted binge drinking among college students which might be explained by the assumption that this population drinks in a risky way particularly often at parties and various social gatherings. Nevertheless, these assumptions should be confirmed by future studies.

	Enhancement	Social	Conformity	Coping	R ²
Alcohol use					
Adolescents	0.18	0.45***	-0.24***	0.04	33.8%
College students	0.67*	-0.24	-0.05	-0.06	17.3%
Drunkenness					
Adolescents	0.65***	0.04	-0.27**	0.03	33.7%
College students	0.72*	-0.23	-0.04	-0.21	16.2%
Binge drinking					
Adolescents	0.38	0.03	-0.18***	0.13*	19.5%
College students	-0.13	0.44*	0.01	0.06	12.1%

Table 3: Drinking motives as predictors of alcohol use, drunkenness, and binge drinking in adolescent and college students in Study 1 (standardized regression coefficients in SEM)

Note: *: p<0.05, **: p<0.01.

To conclude, results showed a not entirely adequate model fit of DMQ-R-HU, while the measurement properties of DMQ-R-SF-HU were good. Besides the reliability and validity of the measure, it is an additional advantage of the short version that it is easier to use and it takes less time to complete it. Thus, it can be easily included in large health surveys. Finally, the translation of fewer items may lead to less mistakes and bias.

4.2 Study 2

4.2.1 Sample

Data was collected in the NGO village of the Sziget festival in 2007. In total, approximately 700 persons were approached of which 543 visitors (77.6%; age range 12 to 77 years) filled out the questionnaire. However, 153 questionnaires were excluded for various reasons. The final sample consisted of 390 young adults (172 males and 218 females, mean age 23.6, SD=4.4); . 56% lived in Budapest, about one third (31%) had completed college or university education, and another 57.2% had graduated at secondary school.

4.2.2 Measures

Besides using the Drinking Motives Questionnaire Revised Short Form (DMQ-R-SF-HU) respondents were asked about the frequency of drinking and drunkenness (in the last 30 days respectively) and about the frequency of problems related to alcohol use (e.g. academic problems, violent behavior) in the last 12 months.

4.2.3 Key results and discussion

The study confirmed the four-dimensional structure of drinking motives also in an older, special, more heterogeneous sample in a recreational context. Furthermore the psychometric properties of the DMQ-R-SF-HU were also appropriate. The model fit freely estimated to the whole sample was also adequate ($\chi^2=129$; $df=48$; $CFI=0,94$; $TLI=0,92$; $RMSEA=0,066$ [0,052-0,080]; $SRMR=0,057$).

Estimated correlations between motives had the same pattern like in previous research (Kuntsche and Kuntsche, 2009; Mazzardis et al., 2010). Results between women and men were also equivalent. There were, however, some differences in the results of the earlier studies. The item of the enhancement scale 'because it is fun' had a relatively low factor loading (<0.6) and the internal consistency of the enhancement scale remained also somewhat below the threshold (Cronbach Alfa: 0.65) (Table 4). I was faced with the same problem in Study 1 in the college sample: the item loading of 'because it is fun' proved to be lower compared to the other items, and the value of Cronbach Alfa was 0.64. Neither in the adolescent sample of Study 1, nor in other international studies (Kuntsche and Kuntsche, 2009; Mazzardis et al., 2010) there was problem with this very item. Thus, it can be assumed that the older respondents have difficulties to interpret this item, which impairs the internal consistency of the whole enhancement scale. In future studies the re-formulation of this item could be considered.

Items	Enhancement	Social	Conformity	Coping
Because you like the feeling?	0.66			
To get high?	0.78			
Because it is fun?	0.48			
Because it helps you enjoy a party?		0.69		
Because it makes social gatherings more fun?		0.74		
Because it improves parties and celebrations?		0.86		
To fit in with a group you like?			0.61	
To be liked?			0.83	
So you won't feel left out?			0.77	
Because it helps you when you feel depressed or nervous?				0.81
To cheer up when you're in a bad mood?				0.82
To forget about your problems?				0.73
Correlation with the social factor	0.72			
Correlation with the conformity factor	0.31	0.31		
Correlation with the coping factor	0.61	0.38	0.43	
Cronbach Alfa	0.65	0.80	0.76	0.82

Table 4: Results of CFA: standardized factor loadings, correlations between factors and internal consistency in Study 2.

The rank order of drinking motives (Table 5) was consistent with the results of Study 1 and other international studies (Kuntsche and Kuntsche, 2009; Mazzardis et al., 2010). Social motives had the highest mean level, followed by enhancement, coping and conformity motives.

	TOTAL	GENDER		GENDER DIFFERENCES		
		Males	Females	t	df	p<
Social	2.12 (0.58)	2.22 (0.57)	2.03 (0.57)	3.31	388	0.01
Enhancement	1.76 (0.52)	1.84 (0.53)	1.69 (0.51)	2.89	388	0.04
Coping	1.47 (0.53)	1.47 (0.53)	1.47 (0.54)	0.03	388	n.sz
Conformity	1.26 (0.41)	1.33 (0.48)	1.20 (0.34)	2.91	301	0.04

Table 5: Mean levels of drinking motives and gender differences (with standard deviation in brackets) in Study 2

Results of structural equation modeling showed (Table 6) that only the externally driven – thus considered being more variable – social motive may predict the frequency of drinking. It seems that in recreational context social factors are decisive for drinking among young adults. Frequency of alcohol-related problems (e.g. academic problems, violent behavior, risky sexual intercourse) was predicted by coping motives which supports international data (Cooper, 1995; Kuntsche et al., 2005). Similarly to the results of Bradley, Carman and Petree (1991) not only coping but also social motives could also predict the frequency of academic problems suggesting that drinking with friends is an important leisure activity for students having difficulties at school or university, which probably contributes again to the poor academic performance. Nevertheless, it has to be noted that the formulation of question referred only to problems at school and did not include problems at workplaces. This might have caused some bias because older respondents did not feel addressed by the question. Finally, not surprisingly and underpinning previous results (Cooper, 1994; Kuntsche, Stewart and Cooper, 2008) conformity motives proved to be a predictor of violent behavior. Thus, drinking to fit into a group is associated with the physical aggression of festival visitors.

	Enhancement	Social	Conformity	Coping	Gender	Age	R ²
Alcohol use							
Frequency of drinking	0.15	0.20*	-0.04	0.09	-0.21***	-0.10*	16.5%
Frequency of drunkenness	0.23	0.18	-0.11	0.15	-0.16***	-0.12*	22.7%
Alcohol-related problems							
Academic problems	0.16	-0.21*	0.08	0.30***	-0.15**	-0.12*	15.2%
Risky sexual intercourse	0.07	-0.13	0.06	0.23**	-0.09	-0.02	7.5%
Violent behavior	-0.19	0.08	0.15*	0.30***	-0.18***	0.00	11.6%

Table 6: Drinking motives as predictors of alcohol use and related problems (standardized regression coefficients of the two multivariate linear structural equation models) in Study 2

Note: All models were adjusted for gender and age; explained variance (R²) does not include gender and age effects. * P < 0.05; ** P < 0.01; *** P < 0.001

To conclude, results confirm that the DMQ-R-SF-HU is a valid, reliable and rapid measure also in a recreational setting. The invariant results between different sub cultural groups prove that the questionnaire may not only be used in large health survey but also in smaller samples and in special contexts such as a music festival. The most important implication of the results is that the DMQ-R-SF-HU can be easily applied to assess the motivational background of drinking also in settings (e.g. parties, clubs) where hard-to-reach, vulnerable groups are present and the time available for filling out questionnaires is strictly limited. Because this recreational scene is a rather new phenomenon in Hungary, few studies have been carried out on the patterns and motives of substance use (Demetrovics 2001, 2006; Demetrovics et al., 2008). The use of DMQ-R-SF-HU could provide information about the motivational background of young party-, festival-goers and clubbers in different subcultures of the recreational scene.

4.3 Study 3

4.3.1 Sample

Participants were recruited in spring 2009 in three Spanish and three Hungarian universities. Respondents received a hyperlink and a password in the recruitment email to access the online questionnaire. In Hungary, at the Eötvös Loránd University of Science 1075, at the Budapest University of Technology and Economics 870 and at the Corvinus University of Budapest 900 students received a call to participate. In Spain, at the University of Almería 962, at the University of Huelva 1119 and the University of Sevilla 29 students were asked to participate in the research.

Overall, 1588 people completed the questionnaire: in Hungary 1011 students (response rate 35.5%) and in Spain 577 students (response rate 27.3%). These response rates are comparable with other online surveys on drinking motives and alcohol use among university students (for a further discussion, see e.g. Kuntsche, Von Fischer and Gmel, 2008). Then 41 students were excluded (17 Hungarian and 24 Spanish, 2.6%) because they did not drink alcohol in the last 12 months. The final sample consisted of 1547 respondents: in Budapest 1011 persons (35.5% of the respondents) and in Spain 577 persons (27.3% of the respondents). The rate of gender was similar across the two samples: 37.4% Hungarian males and 36.7% Spanish males. The mean age of the Spanish students were slightly older (22.7 years, SD=3.18) than the Hungarians (mean age 22.4, SD=2.69).

4.3.2 Measures

The Drinking Motives Questionnaire Revised Short Form (DMQ-R-SF-HU) was used to assess drinking motives. However, instead of using the three-point reply scale of the short form of DMQ-R-SF-HU, the five-point relative frequency scale of the DMQ-R-HU was applied. Respondents were asked also about the frequency of drinking and drunkenness (in the last 30 days respectively). The frequency of problems related to alcohol use (e.g. academic problems, violent behavior) was measured by the 23-item RAPI scale (Rutgers Alcohol Problem Index: White and Labouvie, 1989).

4.3.3 Key results and discussion

Hungarian students were characterized by a higher drinking frequency, more frequent drunkenness events and a higher prevalence of alcohol-related problems. In the last 12 months, 30.3% of the Hungarian students reported drinking more than once a week, while in Spain only 21.8%. Similarly, concerning alcohol use in the last month almost half of the Hungarian respondents (49.3%), while only slightly more than one-third of the Spanish respondents (35.8%) indicated alcohol use at least weekly or more frequently. Drunkenness in the last month and also in the last year was more frequent among Hungarians. In addition, RAPI scores indicating the level of problem drinking were higher in the Hungarian (8.41) than in the Spanish sample (7.74)

The four-factor model of drinking motives was equivalent across the two countries suggesting that this model is valid and robust in intercultural comparison as well. Based on the results the DMQ-R-SF-HU as a scale (Kuntsche and Kuntsche, 2009) proves to be a good measure to assess drinking motives also in very different drinking cultures. The rank order of motives was the same in both cultures. Our results showed remarkable similarities in drinking motives and in their links to alcohol-related outcomes between Spain and Hungary.

The confirmatory factor analysis with covariates showed (Table 7) significant difference between cultures in social, enhancement and coping motives. Hungarian students endorsed a higher mean level in social, enhancement and coping motives. Previous research indicated that compared to moderate drinkers, heavy drinkers are characterized by higher mean level in drinking motives (Montgomery, Benedicto and Haemmerlie, 1993; Stewart and Power, 2002). Thus, our results support epidemiological data concerning difference between the Mediterranean and Central-Eastern European drinking culture and they reflect well the particularly worrying hazardous drinking style in Hungary in the general population (Global Status Report on Alcohol, 2004; Popova et al., 2007).

Furthermore, the confirmatory factor analysis with covariates revealed also that there is a significant association between gender and social, enhancement and conformity motives, meaning that men score significantly higher on these factors independently of culture and age. Age had a significant negative association with social and coping motives while controlling for culture and gender (Table 7).

	Culture	Gender	Age
Social	-0.20***	-0.13***	-0.07*
Enhancement	-0.11***	-0.12***	-0.04
Coping	-0.16***	0.02	-0.08**
Conformity	-0.04	-0.07*	-0.04

Table 7: The impact of culture, gender and age on drinking motives from the MIMIC model (with standardized coefficients) in Study 3

Notes: Culture is coded 0 for Hungarians and 1 for Spanish. Gender is coded 0 for males and 1 for females. *: $p < .05$; **: $p < .01$; *** $p < .001$.

Multivariate SEM analyses showed an adequate fit of the models in which paths between drinking motives and the different alcohol-related criterion measures were freely estimated in both groups (χ^2 Hungarian=262.8; $df=88$ CFI=.963; TLI=.943; RMSEA=.045 [.038-.051] SRMR=.032; χ^2 Spanish=233.5; $df=88$ CFI=.944; TLI=.914; RMSEA=.055 [.046-.063] SRMR=.059).

Consistent with previous studies (Cooper et al., 1995; Kuntsche et al. 2005) enhancement motives predicted the frequency of drinking and drunkenness. Alcohol-related problems were predicted by coping motives in both countries (Table 8).

	Drinking			Drunkenness			Alcohol-related problems		
	Stand. coef.	SE	p	Stand. coef.	SE	p	Stand. coef.	SE	p
SPAIN									
Social	-0.05	0.14	0.742	-0.02	0.17	0.896	0.01	0.16	0.936
Enhancement	0.50	0.14	0.001	0.46	0.16	0.005	0.41	0.15	0.006
Coping	0.11	0.07	0.132	0.12	0.10	0.210	0.23	0.07	0.001
Conformity	-0.12	0.06	0.029	-0.11	0.07	0.124	0.16	0.11	0.16
(R^2)	20.7%			21.7%			43.2%		
HUNGARY									
Social	-0.10	0.17	0.573	-0.04	0.16	0.796	0.05	0.17	0.784
Enhancement	0.50	0.22	0.021	0.45	0.21	0.035	0.22	0.21	0.309
Coping	0.01	0.09	0.883	-0.01	0.09	0.940	0.36	0.09	0.001
Conformity	-0.10	0.04	0.017	0.03	0.05	0.473	0.03	0.04	0.649
(R^2)	15.7%			16.0%			32.2%		

Table 8: Drinking motives as predictors of alcohol use, drunkenness, and risky drinking in the Spanish and Hungarian sample (standardized regression coefficients from freely estimated models, standard errors) in Study 3

Notes: All models were adjusted for gender and age effects; R^2 does not contain gender and age effects.

However, an unexpected result was a predictive relationship between alcohol-related problems and enhancement motives among Spanish students, unlike the Hungarian sample. This might have two explanations. First, Hungarians scored higher on enhancement motives and problem drinking (RAPI scores) suggesting that both are more common in Hungary than in Spain. Consequently, among Spanish drinkers enhancement drinking is less typical, however enhancement drinkers represent a special cluster, and among them the frequency of both alcohol-problems and enhancement motives is high. Therefore enhancement motives might be an indicator of problematic drinking among Spanish students. However, it might also be the case that the group of Spanish problem drinkers is dominated not only by those who drink to cope with their difficulties (coping drinkers) but also by enhancement drinkers. This latter type of drinker might drink in such considerable quantities to enhance the effects of alcohol and to have fun that it finally leads to problems. This finding itself does not imply a higher prevalence of alcohol-related problems among young Spanish adults; however, it points out the vulnerability of Spanish enhancement drinkers. A study by Calafat et al.

(2005) confirms the assumptions that the traditionally moderate Mediterranean drinking style is no longer protective and is fundamentally changing. The authors investigated the relatively new phenomenon in Spain called 'botellon', which describes binge drinking activities of young people in large peer groups in open places. According to the study in Galicia, 40% of the population between 14 and 24 years has been to a botellon at some time (Calafat et al., 2005). Further studies should confirm whether Spanish enhancement drinkers are particularly prone to risky and problem drinking in botellons. We can hypothesize that drinking in high-risk situations (e.g., in parks, so avoiding certain controls in clubs and bars, such as age limit) might increase alcohol consumption (e.g., to enhance fun and excitement) and meanwhile it can lead to more alcohol-related problems such as accidents, unprotected sex, etc.

Taken together, despite the substantial differences in the drinking culture of both countries, this cross-national comparison showed striking similarities and only a few differences in drinking motives between Spain and Hungary. The importance of drinking motives (such as indicated by the rank order of motives), the predictive relationship between conformity motives and frequency of drinking, between enhancement motives and frequency of drinking and drunkenness and between coping motives and alcohol-related problems were invariant across cultures. Thus, our findings do not indicate such great diversities as have been reported about drinking motives in cultures from different continents (Nagoshi et al., 1994; Gire, 2002). It seems that even if Europe is characterized by major cross-cultural differences in alcohol use (Anderson and Baumberg, 2006), personal drinking motives and their impact on alcohol outcomes seems to be rather stable.

5 Summary

To conclude, several aspects of the results can be highlighted. Independently of age, gender and culture the externally driven social motives had the highest mean level which are not related to risky drinking and alcohol-problems. This indicates that most people drink alcohol moderately only because of the social context and the positive mood, which does not cause any concerns.

In the relationship between risky drinking, alcohol-problems and drinking motives a complex picture can be drawn up. Regarding the development of motives in the life span a process of internalization can be observed, indicating a shift from social (external) towards future internal drinking motives. This is consistent with the results of the longitudinal study of Schelleman-Offermans, Kuntsche and Knibbe (2010). While among adolescents conformity motives play a decisive role and peers essentially influence the frequency of drinking and drunkenness, later on the internally generated motives (coping and enhancement motives) have a strong impact. Although based on Study 1 and 2 it can be concluded that (the externally driven and positive rewarding) social motives are determinant in the frequency of drinking, the problematic way of drinking – as described above – is predicted by internal motives. In contrast to that, among adolescents conformity motives are the predictor of risky drinking. Nevertheless, a group of adolescents can be identified, consisted of coping and enhancement drinkers, who are at substantial risk in terms of frequent drunkenness and binge drinking (Study 1). There is a great need for prevention programs targeting this group of adolescents.

Furthermore, based on the comparison of adolescents and college students (Study 1) it was revealed that teenagers endorse significantly more motives with negative outcome such as conformity and coping motives than young adults. This suggests that to fit into a valued group and to escape from problems are important reasons for drinking among adolescents compared to college students.

Concerning the role of gender and age we can conclude the results of Study 1 that adolescent boys drink more than girls, and this is reflected in the higher mean level of motives among boys. In particular, making social gatherings more enjoyable can be considered as the 'engine' of their alcohol consumption. However, Study 1 showed also that with the age, a group of coping drinkers can be identified among females who are at great risk in terms of alcohol-related problems.

Nevertheless, Study 2 and 3 could not confirm this result: neither in the recreational setting, nor in the comparison of Spanish and Hungarian students significant difference in coping motives was found between genders. Overall, other studies support indeed the results of Study 2 and 3. For example, earlier studies did not find significant difference in coping motives either in late adolescent (18-19 years; Cooper, 1994) or in young adulthood (18-21 years; Nagoshi et al., 1994; Carey and Correia, 1997; Stewart, Loughlin and Rhyno, 2001) between males and females. Moreover, Gire (2002) found significantly higher mean level of coping motives among men both in the U.S and the Nigerian sample. Nevertheless, it might be plausible that in Hungary among the older groups more women drink to cope with their problems than men. Thus, coping drinker females are prone to be at high risk. However, this assumption has to be verified in future research.

Finally, it has to be mentioned that research on drinking motives clearly demonstrate the high risk of internally driven (enhancement and coping) motives in terms of hazardous and problematic drinking (Kuntsche et al., 2006). Results can be summarized that enhancement motives predict frequent drinking and drunkenness, and coping motives predict the frequency of alcohol-related problems (Kuntsche et al., 2005). These associations were confirmed by my results. Among college students and teenagers enhancement motives predicted indeed the frequency of drinking and drunkenness (Study 1 and 3) but in the recreational population (Study 2) enhancement motive did not have a predictive role. In the recreational setting only the social motives predicted the frequency of drinking, which might be explained by the social characteristics of the festival. Coping motives predicted in all three studies the frequency of alcohol-problems. Thus, enhancement and coping motives have a central role in terms of hazardous and problematic drinking but in the recreational setting social factors and the enjoyment of party have to be taken into consideration in the prevention programs.

6 Implications

Results have implications particularly in two fields. With respect to the practical applicability and to future studies it is crucial to emphasize (1) the implications for the measurement of drinking motives and (2) the usefulness of drinking motives for prevention.

Measuring drinking motives

Results demonstrated the four-dimensional structure of drinking motives. In contrast to the three-factor model (Cooper et al., 1992; Stewart, Zeitlin and Samoluk, 1996) which was in use previously, results showed that including conformity (the fourth) motives is especially necessary in investigating adolescents because conformity motives predicted the frequency of drinking and drunkenness (Study 1). Recently Grant and his colleagues (2007) have proposed a five-dimensional structure, in which the fifth motive was constructed by the division of the coping motive into coping-anxiety and coping-depression factors. Investigating the five-dimensional structure of drinking motives could represent a new approach which was beyond the scope of this thesis.

In Study 1 the Drinking Motives Questionnaire Revised (DMQ-R; Cooper, 1994) and the Drinking Motives Questionnaire Revised Short Form (DMQ-R-SF; Kuntsche and Kuntsche, 2009) were compared. Results supported the use of short form due to the better model fit. Nevertheless, the use of the long version should not be rejected. Study 2 also confirmed the good model fit of the DMQ-R-SF in a special setting and with heterogeneous sample. In Study 3 the short version was used with the five-point frequency scale of the long version due to methodological consideration because a wider scale might better reflect the drinking motives of the respondents. The lessons learnt were favorable and future studies might apply this combination as well.

The majority of research has used cross-sectional data which does not enable the investigation of possible causal relationships. In future, methodological well-developed longitudinal studies could provide strong evidence on the developmental trend of drinking motives.

Finally, it has to be noted that the assessment of drinking motives via questionnaires covers only one aspect of alcohol-related cognitions which should be taken into consideration by future studies. Questionnaires based on the Motivational Model assess only explicit cognitions related to alcohol. Thush and Wiers (2007) assume that implicit cognitions are determined rather by past experience, while explicit cognitions (e.g. alcohol expectancies) are influenced mainly by recent impressions or the given context. These considerations point out to the need to investigate implicit cognitions in drinking motives because they could provide supplementary information on the issue why young people drink.

Usefulness of drinking motives for prevention

Drinking motives appear to be an interesting concept for targeting prevention programs for at-risk adolescents. Conrod and his colleagues (2006) argue that prevention programs to reduce heavy drinking might be effective if they aim to change maladaptive drinking motives related to risky drinking. Mainly coping and enhancement motives can be considered as maladaptive drinking motives. My empirical research confirms the high-risk of coping and enhancement motives because in all studies these two motives were predictive of heavy drinking and of alcohol-related problems.

Kuntsche and his colleagues (2010) found that enhancement and coping drinkers differed in demographic characteristics, leisure time activities, social relationships and typical drinking contexts. Consequently, it appears promising to target enhancement and coping drinkers with specific prevention programs that take into account their specific needs and problems. It is assumed that coping drinkers need interventions aimed at reducing the stress level, developing their coping strategies, increasing the self-esteem and enhancing multiple competences through life skill trainings (Kuntsche et al., 2010). Contrarily, enhancement drinkers need interventions based on social effects, or alternative sources of stimulation, cognitive restructuring techniques and reinforcement of resistance skills to offers of alcohol (Cooper, 1994; Kuntsche et al., 2010). These results have implication for alcohol policy as well. Enhancement drinkers were found to have drinking peers and to go out frequently in the evenings and they are likely to drink in bars. In this respect, it appears effective for this group to reduce underage sales of alcohol in public drinking places, to create a safe drinking environment (Homel et al., 2004) and to foster healthier night life (Mervó, Kun and Demetrovics, 2010).

One of the most important implications of the findings in the recreational scene (at the festival, Study 2) is that the DMQ-R-SF-HU can be easily applied in special settings as well. Thus, DMQ-R-SF-HU could be used at festivals or in the recreational scene as a rapid assessment of drinking motives to identify enhancement and coping drinkers (Kuntsche et al., 2010) and as a possibility to provide a short feedback to the respondent. A personal feedback on their primary motivation for drinking might trigger a process in which they reflect in their various (otherwise mostly unconscious) decisions to drink and could be an entry point for counseling programs. Evidence shows that providing feedback on the participants' drinking patterns and on their misperception of others' drinking was related to a reduction of their alcohol use and to an increase of problem recognition at follow-up (Walters et al., 2000; Neighbors et al., 2004). In particular personalized feedback has a great impact on adolescent alcohol use compared to more comprehensive interventions (Walters et al., 2000). Festivals and clubbing scenes seem to be an ideal setting to give young adults such a feedback after having filled out the DMQ-R SF. As in our sample social motives were the most frequently indicated dimension it is noteworthy that personalized feedback among social drinkers proves to be more effective than among those who drank primarily for other motives (Neighbors et al., 2004).

Evidence about the use of drinking motives in prevention (Gorman, 2001; Komro and Toomey, 2002; Masterman and Kelly, 2003; Swaim, 2003; Stewart et al., 2005; Conrod et al., 2006) show that motives can be tackled in various ways in interventions. First, drinking motives might serve as a compass to identify maladaptive motives and young people at risk. Second, completing the

questionnaire and providing a rapid feedback might trigger a process of reflection which offers a potential 'entry point' for prevention activities. Third, interventions might target the restructuring of maladaptive drinking motives (e.g. Conrod et al., 2006). Research on how to strengthen protective drinking motives associated with moderate alcohol consumption and to change maladaptive drinking motives associated with heavy drinking should be a central aim of future studies.

7 References

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