

# Which sociocultural determinants of pre-drinking amongst undergraduate university students influence motivation

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## Abstract

Pre-Drinking (PD) has been highlighted as a global health concern. It is normalised behaviour for undergraduate (UG) university students, with heavy episodic drinking frequently reported. This paper provides an insight into which sociocultural determinants of PD influence motivation amongst UG university students. It also determines the relationship between PD and drinking games (DGs), and investigates the hypothesis that availability of inexpensive alcohol increases PD.

An anonymous online questionnaire was sent to undergraduate students in the UK, mainland Europe and Singapore and 351 students (mean age 21.8 years) participated. Results highlighted that 93.7% of students participated in PD and that the trends of PD and DG playing are interlinked. Participants identified 'before going out' as a situation for playing DGs, indicating PD taking place. Findings corroborate that PD by university students is normalised behaviour, supporting determined drunkenness, a culture of intoxication, and insights into the relationship between PD and positives and pleasures.

Students state motives for PD are ostensibly for fun/pleasure, sociability, and cost reasons. Of participants, 73% identified 'to pre-party' as an important reason for DG playing. PD is prevalent and regarded as inexpensive, and fun. However, PD often results in detrimental effects on health and wellbeing which should not be underestimated. Harm reduction strategies, therefore, need to be cognisant of the social norms, cultural factors and pleasures associated with PD and playing DGs.

## Introduction

### *Participation in pre-drinking by undergraduate university students*

Despite the recent reported decline of alcohol consumption in young people from the global north (MacArthur et al; 2017, Holmes et al; 2022), undergraduate (UG) students remain a population of concern and report higher rates of heavy alcohol use than their non-university attending contemporaries (Merrill and Carey, 2016; Moagi and van der Wath, 2023). University students frequently engage in heavy episodic drinking participating in pre-drinking (PD) or drinking games

(DGs) which often facilitate increased levels of alcohol consumption (McInnes and Blackwell, 2001).

Pre-drinking, also referred to as pre-partying, pre-gaming, and pre-loading (Foster and Ferguson, 2014), entails the consumption of alcohol in a domestic setting prior to going out or attending a specific event where more alcohol may be consumed (Hummer et al; 2013). Pre-drinking, together with drinking games, often facilitates increased levels of alcohol consumption (George and Zamboanga, 2018) and is associated with a range of negative consequences (Zamboanga et al; 2014, Zamboanga and Olthuis, 2016). Despite the risks, UG students are engaged in PD which is perceived as being socially acceptable as part of the drinking culture pervasive in university environments (Conroy et al; 2021).

### *Sociocultural determinants*

A contributory factor to high-risk drinking practices is the availability of cheap strong alcohol to purchase from supermarkets and off-licences (off-trade). The reduced costs from drinking alcohol purchased off-trade result in an increased chance of consuming six or more alcoholic drinks in a typical session and daily drinking (Casswell et al; 2014). Further compounding the risk, adverse consequences have been noted when drinking is concealed from public view (IAS, 2020). Several countries have considered pricing interventions, including the introduction of a minimum unit price (MUP) of alcohol (Sharma et al; 2014), with the aim of reducing overall consumption (Yeomans, 2019) and alcohol related harm (World Health Organization, 2022).

There is a global variance in sociocultural determinants for participating in PD, as well as differing perceptions around alcohol use and age of consumption (Mackinnon et al; 2017, Dumbili, 2022a; George et al; 2023). An understanding of differing cultural conventions, rituals, and contexts of drinking within wider cultural spheres (Lowe et al; 2023), is integral to an understanding of students' engagement in practices related to their PD. Dumbili (2022b) identifies the role of intoxication in identity construction and the positive feelings associated with PD participation. Cross-country comparisons are, however, challenging, as measurements of PD participation vary (Zamboanga et al; 2021).

Explanations for PD include, for fun and pleasure (Dumbili, 2022a), achieving a state of 'determined drunkenness', i.e., drinking with the intent of becoming inebriated (Measham, 2006) and within a culture of intoxication (Szmigin et al; 2008). Post consumptive narratives also contribute to the sense of enjoyment with the reconstruction of experiences (Hennell et al; 2022) and shared drinking stories based upon gender (Griffin et al; 2009). Students' motives for PD are complex and shaped by sociocultural and economic conditions (Shildrick and McDonald, 2006). Furthermore, the extensive marketing of alcohol targeting young adults in the global north, contributes to the cultural normalisation of young peoples' drinking (Finan et al; 2020).

Normalisation theory can be used as a 'barometer for change' (Parker, 2005) to highlight how PD, and event specific PD, has evolved and changed in different countries over time. Parker et al's (1998) normalisation theory explains the behavioural and attitudinal change of young people, while also considering sociocultural and economic factors. Moreover, social identities and capital are constructed, via the normalisation of PD, intoxication, and the ability to outdrink peers by participating in DGs based on gender roles, which account for important social variables related to PD participation

(Dumbili, 2022a).

The social aspect of pre-drinking (De Visser et al; 2013) may be one of the reasons why students drink more than intended, to have fun, maintain group norms and enhance social relationships (Dumbili, 2022a). Research in the US has identified the prevalence, motives, and consequences of students PD (Zamboanga and Olthuis, 2016). However, much less is known about PD elsewhere (Foster and Ferguson, 2014). Moreover, there is an absence of studies concerning the contribution of associated positive motives and the resulting pleasures for young people. Research into the reasons for PD, and how sociocultural contexts shape these motives is also warranted.

Pre-drinking is associated with increased alcohol use and various adverse alcohol-related consequences (McInnes and Blackwell, 2001). However, the motivation for engagement in PD, remains unclear. The motives for general drinking do not explain the rewards of increased alcohol consumption observed during PD sessions (Kuntsche and Labhart, 2013). Measures that rely on drinking occasions, tend to focus on drinking as the primary or sole activity, potentially excluding drinking that may be co-occurring among other activities, i.e., playing DGs (Caluzzi et al; 2021).

Pre-drinking 'fun/intoxication' motives increase the chances of getting drunk before going out and subsequent inebriation (Peacock et al; 2015). Smit et al; (2021) examined the association of three PDM factors (fun/intoxication, facilitation, and conviviality) with adverse alcohol-related consequences. They identified that 'fun/intoxication' pre-drinkers are at increased risk for alcohol consumption and its consequences, when compared with those who pre-drink for conviviality or social facilitation motives (Smit et al; 2021). Pre-drinking generally provides an opportunity to supplement the amount consumed (Foster and Ferguson, 2014) compared to a night without PD (Labhart et al; 2013). Assessing motives unique to specific drinking contexts, i.e., PD (Zamboanga et al. 2017; 2018) is, therefore, important. Furthermore, there is a need to define more clearly, the context in which pre-drinking takes place, and the motivation for doing so (Kuntsche, 2023).

### *The relationship between pre-drinking and drinking games*

Individuals pre-drink for specific motives/reasons (i.e., to make the remainder of the evening more fun) (Haas et al; 2018). PD is distinct from another risky drinking context, playing DGs (Borsari, 2004). It can occur without playing DGs, with students simply preferring to drink alcohol prior to going to their planned event (Hummer et al; 2013). However, they are not mutually exclusive, and DGs are frequently played for the purpose of PD (DeJong and DeRicco, 2007). Drinking games and PD are associated with higher rates of weekly consumption of alcohol and heavy episodic drinking, and with a range of negative outcomes (Zamboanga et al; 2016).

### *Situations where drinking games are played*

This paper differs from, and expands upon, our previous research (McInnes and Blackwell, 2001) which evaluated DG participation, types played, playing situations and motivation, by social work students in universities in the US, the UK and mainland Europe. The study provided an insight into PD participation in DGs, noting that DGs are played by a high proportion of students internationally. Our findings identified a culture of excessive PD before going out, fuelled by a

motivation to get intoxicated, to socialise and have fun. Our previous study highlighted several promising avenues for further research. The sample was representative of a specific type of student and of a particular age group. However, it did not explore in significant depth, the sociocultural determinants of pre-drinking and how this influences motivation in UG students. In addition to understand how to reduce risks effectively, it is critical to consider context specific spaces in which younger students engage in PD, (Graupensperger et al; 2023).

Our current research expands the previous study by scoping a larger, more diverse student population, from additional countries. An analysis of the wider sociocultural imperatives shaping PD participation using a more specific in-depth analysis concerning the motives for PD, is undertaken. The present study furthers understanding of PD among young UG students. It expands knowledge concerning situations/contexts and motives for participation, by a more diverse group of students from universities in Singapore, the UK and mainland Europe. The specific country sites studied are those with traditional heavy episodic drinking cultures amongst students, or busy city centre night-time economies like Singapore.

### *Aims of the research*

The aims of the research include:

1. To understand the situations where participation in PD and DGs by UG university students take place.
2. To investigate students' motives and the social and cultural determinants for participating in PD.
3. To determine if there is a relationship between PD and DGs.
4. To investigate the hypothesis that availability of inexpensive alcohol influences PD.

## Materials and methods

### *Participants*

The study is based on the results of an anonymous online questionnaire sent to UG students in Austria, Belgium, Denmark, Germany, the Netherlands, Poland, Russia, Singapore, the UK, and the US. The motives measure was adapted from Johnson and Sheets (2004) and Zamboanga et al; (2017). Opportunistic sampling was employed, in universities where the UK university has franchise, Erasmus and staff/student mobility links. The study was advertised via the universities' online portals and was restricted to UG students, and no incentives were offered. Had incentives been offered this would probably have led to an increased sample size. Students were recruited from the home and a partner university in the UK, a franchise partner in Singapore, a university in Texas, and Erasmus partner universities in Austria, Belgium, Denmark, Germany, the Netherlands, Poland, and Russia. The sample included students from business, childhood studies, guidance and counselling, nursing, psychology, and social work degree programmes. Students were accessed over three months in the Autumn semester of 2021. The online questionnaire was previously piloted at the UK home university.

## *Covid 19 restrictions in each country*

Covid 19 lockdown measures have enabled young people to change their relationships with alcohol, leading to new norms around PD (Nicholls and Conroy, 2021), influencing routines, times of use and drinking practices (Caluzzi et al; 2021). Online survey data suggest higher consumption of alcohol during the pandemic (EMCDDA, 2021), especially in the UK (Kilian et al; 2021) with drinking-to-cope motivations (Mohr et al; 2021). Therefore, during the survey period any Covid related restrictions which may have affected student PD behaviours across the different countries/states were considered.

In the UK no lockdown restrictions were in place and universities had a hybrid of face to face, synchronous (live and interactive online teaching sessions), and asynchronous (self-directed and pre-recorded) teaching methods in place. Denmark and the Netherlands had no Covid restrictions in place and had 100% face to face teaching. In Belgium, Russia and Texas, there were no lockdown restrictions with teaching sessions delivered in a hybrid form, with some face-to-face teaching and online sessions. In Germany, only those who had recovered from an infection or were vaccinated against Covid, were allowed face-to-face teaching. Similarly in Austria, a '3G rule' proof of having been either, 1G = Vaccinated, 2G = recovered from Covid, or 3G = tested, was required. Restrictions existed in Poland and Singapore (i.e., masks, social distancing), and only online teaching sessions took place.

## *Measures*

The survey was administered using Jisc Online surveys software. Invitations to participate were emailed using a secure link. A briefing sheet was provided, and informed consent obtained before commencement. The questionnaire was in English and, before being administered, it was approved by the UK University Ethical Research Committee. The survey consisted of 12 questions, divided into three main sections. The first section comprised demographic questions including age, gender, and country of domicile. The second section included questions concerning participation in PD and DGs, and situations where DGs are played. The final section included questions on the sociocultural determinants of PD.

The questionnaire was structured, to permit only participants who stated that they consumed alcohol, to answer the questions related to PD. Checks were also carried out on the data base to ensure that this was the case. The question, 'Do you drink alcohol?' required a dichotomous, yes or no answer. Participants were asked to rate the importance of eleven different reasons for playing DGs including PD. For each reason five alternatives were provided from an ordinal ranking scale ranging from '1. not at all important' to '5. very important'. Finally, participants were asked to rate their reasons for PD.

## *Data analysis*

The data set was analysed using IBM SPSS Version 26. Descriptive statistical information including frequency distribution along with range, means etc. was determined. Comparative analysis, to determine similarities and differences, between the various groups, i.e., all subjects, gender, and country, was carried out. Crosstabulations were formulated and, where appropriate, means were compared using the t-test. The data derived from the ratings questions was non-linear non-

scalar data and therefore, was presented in the form of frequency distributions. Weighted Averages (WAs) were calculated for trend comparisons, and non-parametric statistical analysis was carried out, using Mann-Whitney U Test and Kruskal-Wallis Tests, to determine inter-group differences. For individual questions, cell sizes within some groups were found to be small. Since reliability may be affected, and extrapolation to larger populations problematic, small groups were aggregated and groups with cell sizes of <10 were eliminated from analysis. Non-parametric tests, which do not assume the normal distribution, were used because of small groups sizes.

## Results

### *Participants*

Completed questionnaires were received from 390 participants, of which 374 (95.9%) stated that they drank alcohol. Non-alcohol drinkers were excluded, as were participants 30 years of age or older. This resulted in a sample of 351 participants aged 16 to 29 with a mean age of 21.8 years. The sample was predominantly female (79.8%), and participants originally were residents of ten different countries (see Table 1). However, group numbers from Russia, Poland, the Netherlands, and the US, along with males from all countries except the UK, Singapore, and Austria, had cell sizes < 10. These groupings were, therefore, excluded from further statistical analysis as specific individual groups. They were included, however, in the All and Male groupings.

Table 1. Country of domicile and gender of participants

Groups	Gender				Totals
	Female		Male		
	n	%	n	%	
All	280	79.8%	71	20.2%	351
UK	84	86.6%	13	13.4%	97
Singapore	50	62.5%	30	37.5%	80
Austria	42	72.4%	16	27.6%	58
Belgium	30	93.8%	2	6.3%	32
Denmark	25	96.2%	1	3.8%	26
Germany	23	79.3%	6	20.7%	29
Russia	6	75.0%	2	25.0%	8
Poland	7	85.7%	1	12.5%	8
Netherlands	6	100.0%	0	0.0%	6
USA	7	100.0%	0	0.0%	7

### *DGs participation*

A high proportion of participants (93.7%) stated that, within the previous year, they had participated in DGs (see Table 2). The rate for males (97.2%) was slightly higher than for females (92.9%). Participation rates were high across all country groups with 100% in Germany, Austria, and Denmark stating that they had played DGs. Belgium showed the lowest rate of participation (75%).

**Table 2.** Drinking games participation rates

Groups	n	Yes Responses	
		n	%
All	351	329	93.7%
Females	280	260	92.9%
Males	71	69	97.2%
UK	97	95	97.9%
Singapore	80	71	88.8%
Austria	58	58	100.0%
Belgium	32	24	75.0%
Denmark	26	26	100.0%
Germany	29	29	100.0%

### *Situations where drinking games were played*

'Before going out' was reported as a situation for DG playing by 73% of participants (see Table 3). A significantly higher percentage of females (77.7%) compared with males (56.5%) ( $t$ -test  $p \leq 0.05$ ), identified this situation. This suggests a link between DG playing and PD. The highest proportions of participants stating this situation were in Denmark and the UK. These were statistically higher than for Singapore 31% ( $p \leq 0.01$ ). The most frequent situation where DGs were played was at 'birthday parties' cited by 85%, with females again showing significant higher values, 83.1% compared with males 71% ( $p \leq 0.05$ ).

**Table 3.** Situations identified where drinking games were played

Groups	% Responses for Situations Where You Play Drinking Games							
	Before Going Out		Birthday Parties		Freshers' Week		Social Get-Togethers	
	n	%	n	%	n	%	n	%
All	241	73.3%	265	80.5%	83	25.2%	228	69.3%
Females	202	77.7%	216	83.1%	64	24.6%	174	66.9%
Males	39	56.5%	49	71.0%	19	27.5%	54	78.3%
UK	86	90.5%	72	75.8%	44	46.3%	66	69.5%
Singapore	22	31.0%	46	64.8%	11	15.5%	65	91.5%
Austria	51	87.9%	53	91.4%	11	19.0%	25	43.1%
Belgium	19	79.2%	20	83.3%	0	0.0%	17	73.9%
Denmark	25	96.2%	22	84.6%	6	23.1%	17	65.4%
Germany	24	82.8%	28	96.6%	8	27.6%	22	75.9%

### *Motives for playing drinking games*

Participants rated reasons for playing DGs using a Likert scale, (see Table 4). The motives rated most important were 'to have fun' (74.3% rated 4-5, WA 4.1), 'to be sociable' (54.8% rated 4-5, WA 3.22) and 'to meet people' (41.7% rated 4-5, WA 3.22). 'Peer pressure' was identified as the least important (79.9% rated 1-2 WA 1.65). UK participants rated the motive 'to pre-drink' the highest of all country groups. This was significantly higher than compared with those from Singapore and Austria. Singapore rated this motive lowest, and values were significantly lower than Austria, Denmark, Belgium, and the UK (see Table 5).

**Table 4.** Importance ratings of motives for playing drinking games



Groups	n	% Responses for Rating of Importance						% Responses for Rating of Importance						% Responses for Rating of Importance					
		1	2	3	4	5	WA	1	2	3	4	5	WA	1	2	3	4	5	WA
		To pre-party						To get drunk						To have fun					
All	343	29.2	15.2	25.9	17.5	12.2	2.52	29.2	17.5	20.7	23.6	9.0	2.66	7.3	4.7	13.7	24.2	50.1	4.10
Females	272	26.5	16.5	25.7	18.4	12.9	2.75	10.7	17.6	21.7	22.4	9.6	2.49	7.4	5.2	13.2	23.2	51.1	4.06
Males	71	39.4	9.9	26.7	14.1	9.9	2.45	31.0	17.0	17.0	31.0	7.0	2.75	7.0	2.8	15.5	28.2	46.5	4.04
UK	96	12.5	8.3	28.1	28.1	22.9	3.40	14.6	15.6	21.9	32.3	16.6	3.24	4.2	3.1	13.5	21.9	57.3	4.25
Singapore	80	51.3	13.8	22.5	7.5	5.0	2.01	50.0	8.8	15.0	20.0	6.3	2.24	11.3	8.8	11.3	20.0	48.8	3.86
Austria	58	24.1	13.8	4.1	15.5	5.2	1.52	31.0	17.2	31.0	17.2	3.4	2.44	8.6	3.4	12.1	29.3	46.6	4.02
Germany	29	23.1	23.1	10.3	34.5	13.8	3.07	13.8	37.9	20.7	20.7	3.4	2.52	3.4	3.4	13.8	31.0	48.3	3.08
Denmark	24	20.8	29.2	25.0	12.5	20.8	3.08	20.8	20.8	12.5	37.5	16.7	3.33	4.2	8.3	25.0	16.7	54.2	4.34
Belgium	27	29.6	18.5	22.2	7.4	14.8	2.27	29.6	22.2	18.5	14.8	7.4	2.26	11.1	3.7	3.7	29.6	44.4	3.70
To meet people								To be sociable						Peer pressure					
All	343	18.7	13.4	25.4	24.8	16.9	3.09	12.5	10.5	21.9	31.8	23.3	3.22	64.4	15.7	12.2	5.2	2.3	1.65
Females	272	19.1	13.6	25.0	25.4	16.9	3.07	12.5	10.3	22.4	33.1	21.7	3.41	64.7	16.9	11.4	4.8	2.2	1.62
Males	71	16.9	12.3	26.8	22.5	16.9	2.96	12.7	11.3	19.7	26.8	29.6	3.50	63.4	1.1	15.5	7.0	2.8	1.54
UK	96	14.6	9.4	31.3	24.0	20.8	3.28	5.2	7.3	19.8	36.5	31.3	3.82	74.0	10.4	5.2	2.1	2.1	1.29
Singapore	80	29.7	15.0	15.0	26.3	20.0	3.10	17.5	8.8	15.0	27.5	31.3	3.47	48.0	18.8	20.0	10.0	3.8	2.05
Austria	58	22.4	21.1	24.1	29.3	12.1	3.15	17.2	13.8	24.1	36.2	8.6	3.05	58.6	20.7	15.5	3.4	1.7	1.69
Germany	29	6.9	13.8	37.9	34.5	6.9	3.11	6.9	13.8	34.5	31.0	13.8	3.31	41.4	24.1	17.2	13.8	3.4	2.13
Denmark	24	12.0	25.0	29.2	20.8	20.8	3.37	4.2	12.5	33.3	37.5	20.8	3.82	70.8	20.8	12.5	4.2	0.0	1.67
Belgium	27	33.3	22.2	14.8	14.8	7.4	2.28	25.9	14.8	7.4	29.6	14.8	2.70	81.5	3.7	3.7	3.7	0.0	1.15
Likert Scale 1-5 where 1 = not important to 5 = very important																			
WA=Weighted Average																			

**Table 5.** Non-parametric test analysis; inter-group differences - motives for drinking game playing

Inter-group comparisons	Level of Significant Difference					
	Motives for playing Drinking Games					
	To pre-party	To get drunk	To have fun	To meet people	To be sociable	Peer pressure
Females-Males	0.074	0.868	0.698	0.769	0.542	0.432
UK- Singapore	<b>0.000**</b>	<b>0.000**</b>	<b>0.000**</b>	0.326	0.137	<b>0.000**</b>
UK-Austria	<b>0.001**</b>	<b>0.001**</b>	<b>0.001**</b>	0.651	<b>0.000**</b>	<b>0.006**</b>
UK-Germany	0.151	0.821	0.904	0.758	<b>0.032*</b>	<b>0.000**</b>
UK-Denmark	0.051	0.661	0.264	0.576	0.220	0.220
UK-Belgium	<b>0.004*</b>	<b>0.011*</b>	<b>0.004**</b>	<b>0.004*</b>	<b>0.006*</b>	0.532
Singapore-Austria	<b>0.006*</b>	0.371	<b>0.012*</b>	0.598	<b>0.027*</b>	0.265
Singapore-Germany	<b>0.001**</b>	0.095	<b>0.002**</b>	0.468	0.292	0.450
Singapore-Denmark	<b>0.007*</b>	<b>0.005*</b>	0.602	0.912	0.839	0.086
Singapore-Belgium	0.086	0.486	0.092	<b>0.028*</b>	0.083	<b>0.000**</b>
Austria-Germany	0.256	0.369	0.275	0.444	0.501	0.117
Austria-Denmark	0.733	0.044	0.750	0.623	0.156	0.420
Austria-Belgium	0.342	0.987	0.971	0.658	0.946	<b>0.013*</b>
Germany-Denmark	0.637	0.312	0.729	0.829	0.500	<b>0.041*</b>
Germany-Belgium	0.213	0.460	0.289	<b>0.031*</b>	0.535	<b>0.000**</b>
Denmark-Belgium	0.448	0.090	0.642	0.059	0.210	0.143

### Motives for participating in pre-drinking

As in the previous question a series of motives for PD were assessed using a five-point Likert rating scale (see Table 6). Motives rated most important were 'it's cheaper to drink at home' (58.3% rated 4-5, WA 3.45), 'it's a fun thing to do' (51.4% rated 4-5, WA 3.37), 'to be sociable' (44.3% rated 4-5, WA 3.19), and 'to get the evening started' (48.9 % rated 4-5, WA 3.18). Those rated least important were 'to make you more attractive' (84.7% rated 1-2, WA 1.57), and 'to make you liked' (80.1% 1-2 WA 1.63).

**Table 6.** Importance ratings of motives for participating in pre-drinking

Groups	% Responses for Ratings of Importance						% Responses for Ratings of Importance						% Responses for Ratings of Importance					
	1	2	3	4	5	WA	1	2	3	4	5	WA	1	2	3	4	5	WA
	For pleasure/leisure						To be sociable						To get the evening started					
All	20.6	12.8	28.8	19.2	18.6	3.02	22.2	13.1	28.9	28.0	14.3	3.19	18.1	11.7	21.3	31.7	17.2	3.18
Females	22.1	13.2	28.3	19.1	17.3	2.97	13.6	12.9	29.8	30.5	13.2	3.17	14.7	12.9	21.7	32.4	18.4	3.27
Males	15.3	11.1	30.6	19.4	23.6	3.15	23.9	14.1	25.8	18.3	18.3	2.93	31.0	7.0	19.7	29.6	12.8	2.87
UK	13.5	13.5	32.3	24.0	16.7	2.87	6.3	5.2	28.1	31.3	26.0	3.56	4.2	5.2	17.7	40.0	33.3	3.94

<b>Singapore</b>	17.5	5.0	22.5	18.8	36.3	1.82	25.0	8.8	23.8	26.3	16.3	3.14	33.8	13.8	22.5	22.5	7.5	2.56
<b>Austria</b>	34.5	15.5	25.9	15.5	8.6	2.48	22.4	19.0	41.4	13.7	3.4	2.56	17.2	15.5	25.9	34.5	6.9	2.95
<b>Germany</b>	24.0	24.0	37.9	31.0	0.0	3.10	3.4	24.1	44.8	27.6	0.0	2.96	18.3	6.9	37.9	31.0	6.9	3.04
<b>Denmark</b>	34.6	15.4	30.8	3.8	15.4	2.50	3.8	23.1	19.2	42.3	11.5	3.34	0.0	19.2	19.2	30.8	30.8	3.73
<b>Belgium</b>	12.0	12.0	28.0	20.0	28.0	3.40	28.0	16.0	12.0	32.0	12.0	2.84	24.0	4.0	8.0	44.0	20.0	3.32
<b>It gives you a pleasant feeling</b>							<b>It helps you enjoy party</b>						<b>It's a fun thing to do</b>					
<b>All</b>	19.0	21.0	24.0	26.2	9.0	2.64	22.4	16.6	20.7	26.2	13.7	2.91	13.4	10.5	24.8	29.2	22.2	3.37
<b>Females</b>	15.8	22.1	23.2	29.0	9.9	3.24	19.9	17.7	21.8	26.2	14.4	2.98	10.3	11.4	24.3	30.0	23.4	3.42
<b>Males</b>	31.0	16.9	26.8	19.7	5.6	2.52	32.4	12.7	17.0	26.8	11.3	2.73	25.4	7.0	26.8	25.4	15.5	2.99
<b>UK</b>	6.3	21.0	24.0	34.4	14.6	3.88	9.4	11.5	20.8	34.4	20.8	3.36	5.2	6.3	18.8	37.5	32.3	3.86
<b>Singapore</b>	30.0	17.5	20.0	25.0	7.5	2.63	28.8	10.0	20.0	23.8	17.5	2.92	30.0	8.8	28.8	22.5	10.0	2.74
<b>Austria</b>	24.1	31.0	24.1	20.7	0.0	2.41	27.6	20.7	24.1	22.4	5.2	2.57	10.3	10.3	37.9	19.0	22.4	3.33
<b>Germany</b>	27.6	20.7	24.1	24.1	3.4	2.55	34.5	20.7	13.8	23.1	6.9	2.21	3.4	24.1	24.1	20.7	27.6	3.45
<b>Denmark</b>	11.5	15.4	26.9	30.8	15.4	3.23	23.1	26.9	14.3	19.2	14.3	2.68	3.8	11.5	19.2	42.3	23.0	3.68
<b>Belgium</b>	20.0	16.0	24.0	24.0	16.0	3.00	28.0	28.0	16.0	20.0	8.0	2.52	16.0	16.0	8.0	32.0	28.0	3.04
<b>To talk to people more easily</b>							<b>No pressure for not drinking</b>						<b>To fit in with group and not feel left out</b>					
<b>All</b>	25.1	17.2	25.1	21.3	11.4	2.52	62.1	16.3	12.0	5.5	4.1	1.79	58.6	17.2	12.0	8.2	4.1	1.90
<b>Females</b>	22.8	18.4	25.4	21.7	11.8	2.62	60.7	17.6	12.9	5.1	3.7	1.74	57.4	17.6	13.2	7.7	4.0	1.75
<b>Males</b>	33.8	12.7	23.9	19.7	10.0	2.60	67.6	11.3	8.5	7.0	5.6	1.72	63.3	15.5	7.0	9.9	4.2	1.76
<b>UK</b>	17.7	12.5	25.0	26.0	18.8	3.02	57.3	19.8	10.4	7.3	5.2	1.83	61.5	12.5	10.4	12.5	3.1	2.18
<b>Singapore</b>	33.8	8.8	22.5	20.0	15.0	2.34	45.0	17.5	20.0	8.8	8.8	2.19	43.8	16.3	17.5	12.5	10.0	2.20
<b>Austria</b>	27.6	29.3	25.8	15.5	1.7	2.46	77.6	13.8	5.2	1.7	1.7	1.36	75.8	15.5	6.9	0.0	1.7	1.36
<b>Germany</b>	17.2	24.1	24.1	20.7	13.8	2.83	55.2	20.7	17.2	6.9	0.0	1.76	37.9	27.6	10.3	17.2	0.0	1.93
<b>Denmark</b>	23.1	30.8	23.1	23.1	0.0	2.61	80.8	7.7	11.5	0.0	0.0	1.31	60.7	23.1	11.5	3.8	0.0	1.57
<b>Belgium</b>	32.0	20.0	24.0	16.0	8.0	2.48	84.0	12.0	4.0	8.0	0.0	1.20	84.0	12.0	4.0	0.0	0.0	1.20
<b>To make you liked</b>							<b>To make you more attractive</b>						<b>It's cheaper to drink at home</b>					
<b>All</b>	64.1	16.0	12.8	3.8	2.6	1.63	66.8	17.9	9.0	4.1	2.3	1.57	19.0	6.7	14.6	22.4	35.9	3.45
<b>Females</b>	62.9	18.0	12.9	3.3	2.9	1.65	65.1	20.2	8.5	3.7	2.6	1.59	16.5	5.9	17.3	23.9	36.4	3.58
<b>Males</b>	71.8	8.5	12.7	5.4	1.3	1.55	73.2	8.5	11.3	5.6	1.4	1.56	28.2	10.0	11.3	17.0	33.8	3.20
<b>UK</b>	62.5	13.5	14.6	6.3	9.4	20.6	65.6	16.7	10.4	6.3	1.0	1.60	9.4	1.0	15.6	24.0	50.0	4.04
<b>Singapore</b>	56.3	17.5	16.3	6.3	7.9	2.05	52.5	18.8	18.8	3.8	6.3	1.93	30.0	8.8	22.5	16.3	22.5	2.70
<b>Austria</b>	74.0	12.1	10.3	0.0	3.4	1.46	75.9	17.2	3.4	1.7	1.7	1.36	15.5	8.6	8.6	24.1	43.1	3.70
<b>Germany</b>	55.2	20.7	17.2	6.8	0.0	1.75	69.0	20.7	3.4	6.9	0.0	1.48	20.7	3.4	13.8	34.5	27.5	3.44
<b>Denmark</b>	73.0	15.4	11.5	0.0	0.0	1.38	80.8	15.4	3.8	0.0	0.0	1.23	19.2	7.7	7.7	23.1	42.3	3.67
<b>Belgium</b>	92.0	8.0	0.0	0.0	0.0	1.24	84.0	12.0	0.0	4.0	0.0	1.24	24.0	12.0	20.0	20.0	24.0	3.12
<b>Likert Scale 1-5 where 1 = not important to 5 = very important.</b>							<b>WA=Weighted Average</b>											

## Discussion

To our knowledge, this is the first study to evaluate the sociocultural determinants of pre-drinking amongst UG students at

universities in Singapore and in mainland Europe, highlighting the widespread participation in PD and DG playing. Drinking game playing was participated in by 93.7% of respondents, corresponding with the findings of Schumacher (2012). Indeed, all participants from Germany and Denmark stated that they had played DGs. Overall, 97% of participants stated that they had pre-partied.

These findings corroborate that PD by university students is normalised behaviour, with heavy episodic drinking involved (Zamboanga et al; 2018). Findings support determined drunkenness (Measham, 2006; Dumbili, 2022a), with over half the sample stating 'to get drunk' as a motive for DG playing and a similar response was found for PD. Our findings corroborate a culture of intoxication (Szmigin et al; 2008; Dumbili, 2022b), with approximately 75% stating motives for PD, which mapped onto this concept. While other findings develop culturally specific new insights into the relationship between PD and positives and pleasures, with 'for pleasure/leisure', 'it's a fun thing to do' and 'it gives you a pleasant feeling' being universally accepted in our sample. This complements the findings of Dumbili, (2022a) and George et al (2023).

The most frequent situation/event where DGs were played was at 'birthday parties' cited by 80.5% of participants. 'Social get-togethers' (69.3%) were also identified. Overall, 73.3% of participants stated that they played DGs 'before going out'. This indicates a link to PD. Pre-drinking 'before going out' was identified by 81%, corroborating Polizzotto et al; (2007). Our findings support Labhart and Kuntsche, (2017); and Dumbili, (2022a), in that students PD and play DGs for specific motives/reasons (including 'fun', 'to get drunk', 'to be sociable' 'to meet people' and 'pleasure/leisure'). These are consistent with and corroborate the findings of our previous paper. Overall motives for PD rated most important were 'it's cheaper to drink at home', 'it's a fun thing to do', 'to get the evening started', 'to be sociable' and 'for pleasure/leisure'. These fitted with the fun/intoxication', 'conviviality', and 'facilitation' motives identified by La Brie et al; (2011), Bachrach et al; (2012) and Labhart and Kuntsche, (2017).

Students in Singapore appear more conservative, using PD to conform or fit in, unlike the European participants. Furthermore, although the UK group corresponded to the general trends outlined above, giving the highest ratings overall for 'it's cheaper to drink at home', UK ratings were significantly different from other country groups. Alcohol off-trade is available and relatively inexpensive in all the countries, encouraging PD to take place, rather than drinking on licensed premises. This is supported by our findings of 72.9% stating that it is 'cheaper to drink at home' and 70.2% saying that they PD 'to get the evening started' supporting Casswell et al; (2014).

The major strength of this study is that it synthesises data from multiple locations to analyse the intersectional relationships between PD and DGs. This provides a wider perspective than has previously been studied. It focuses specifically on sociocultural determinants. The findings presented may be useful in developing targeted harm reduction intervention for students. We recognise several limitations, the sample size in some of the groups is small and, therefore, may not be truly representative of cross-sectional UG students. It is also disappointing that opportunistic sampling resulted in some smaller cohorts and a gender imbalance. There is also the potential for other motives not considered in the current study for PD and /or DG participation. Having established trends, it would be useful to target younger adolescents, more males, students from other continents, greater numbers and facilitating more qualitative methods i.e., focus groups

to further understand contexts, concepts, opinions, and lived experiences to gather in-depth insights.

## Conclusions

The study provides an insight into PD participation by university students globally. One of the main conclusions is that participation in PD and DGs involve a high proportion of students. The trends of PD and DG playing, reported in our previous study, are corroborated, this study confirms that PD and DG playing are interlinked. The nature and purposes of PD, i.e., to imbibe large quantities of relatively inexpensive alcohol in a short period of time, often results in detrimental effects on health which should not be underestimated.

Students state motives for PD are ostensibly for fun/pleasure, sociability, and cost reasons. Therefore, MUP needs to be established globally, to oppose the harms associated with the cheapest, strongest drinks often consumed by young people for PD and DGs. Moreover, given the prominence for students of social networking, universities need to develop appealing harm reduction interventions, using social media platforms/digital apps/podcasts, to promote safer PD consuming cultures and encourage other lower risk pleasurable activities. Measures such as the Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ; Kahler et al; 2008, Zamboanga et al; 2021b) need to become commonplace in universities to highlight the often-overlooked consequences of PD. According to students PD is inexpensive and fun and, therefore, consuming alcohol is an appealing pleasurable activity for young people, and thus constitutes an endemic problem. Instigators of harm reduction strategies, therefore, need to be cognisant of the social norms, cultural factors and pleasures associated with pre-drinking and playing drinking games.

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