Alcohol ‘Pre-loading’: A Review of the Literature

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Abstract — Aim: To review the international literature concerning pre-loading (PL); this is drinking before going out to pubs and bars. Method: A literature review conducted in May 2013 using the EBSCO database entering the following search terms ‘pre-loading’, ‘front-loading’, ‘pre-partying’ and ‘pre-drinking’. Thereafter, the reference lists were checked for further relevant articles. The review consisted of 40 articles of which 11 were excluded because PL was not the primary unit of analysis or they did not fulfill a quality assurance criterion. Results: Despite being an internationally widespread development to date, most of the research on this has been from the USA and UK. The majority of US studies have been concerned with PL in a college and high school setting, while the research in the UK has mainly concentrated on the correlation/relationship between PL and what takes place when drinkers enter pubs and bars later in the evening. A consistent finding was that PL is associated with greater alcohol consumption, intoxication and alcohol-related risks. The price of alcohol and achieving intoxication were the main motivations for PL. However, other reasons included a chance to meet members of the opposite sex or own friends in surroundings that encouraged interaction rather than intoxication. Conclusion: PL should be regarded as part of a wider drinking culture and understood within the context of what individuals require from a night out or staying in when drinking. There is little evidence to suggest that PL is a risk factor for admissions to accident and emergency services.

INTRODUCTION

Pre-loading (PL) (also known as pre-drinking, pre-partying, front-loading or pre-gaming in the American literature) is the consumption of alcohol at a domestic residence prior to attending licensed premises. To avoid confusion, the term pre-loading is used throughout this paper other than in Table 3 and when describing the literature search methodology. The Scottish Executive (2007) introduced the term into widespread use in the UK.

Wells et al. (2009) stated it was mainly undertaken by young people for reasons of cost, to achieve drunkenness quickly and to socialize with friends or reduce social anxiety. The UK Government published its Alcohol Strategy (HM Government, 2012), and referred to the need to tackle PL within the context of addressing ‘binge drinking’ and heavy episodic drinking in licensed premises in town centres. It cited Hughes et al. (2008) who found that pre-loaders drank significantly more alcohol overall than their non-pre-loading peers, and suffered more negative consequences, such as assault, injury and arrest.

Forsyth (2006) expressed concern that some policies designed to reduce alcohol-related harm could inadvertently encourage PL. These include, firstly, duty increases which disproportionately impact on the price of on-sales alcohol, and increase the price discrepancy between this and off-sales alcohol, frequently cited as a motivation for drinking at home (Foster and Ferguson, 2012). Secondly, restricted closing times which may exacerbate a phenomenon termed ‘post-loading’ (Forsyth, 2006)—drinking after visiting licensed premises. Finally, more rigorous enforcement by door and bar staff that may result in increased confrontation, and more drunk people on the street (Wells et al., 2009).

Much of the work on PL has taken place in the USA. This deals mainly with the drinking behaviour of college students, in the context of campus events, residence and fraternity and sorority parties and sporting-event drinking. Work in the UK has concentrated on the interaction between PL and later use of pubs, bars and night clubs, collectively known as the night-time economy (NTE). To date there has been little work on PL from other countries even though it is frequently mentioned on the Internet (Wells et al., 2009), and Australian conference proceedings reported young adults drinking half a bottle of vodka, a bottle of wine and six or seven beers before going out (Fry and Dann, 2003).

This review

(a) overviews studies dealing with PL;
(b) identifies trends and patterns and negative consequences of PL and motivations for it;
(c) identifies gaps in the evidence base and suggests future areas for research.

METHODOLOGY

Papers and journal articles were searched using the EBSCO database (includes Medline and Web of Science, among others) entering the search terms ‘pre-loading’, ‘front-loading’, ‘pre-partying’ and ‘pre-drinking’ as at December 2012. The first two search terms returned a number of false-positives, and were refined to ‘pre-loading and alcohol’; ‘pre-loading and drinking’; ‘front-loading and alcohol’ and ‘front-loading and drinking’ and ‘drinking before drinking’.

These search terms returned a total of 33 papers. The references from these papers were checked for further relevant articles not identified by database searches, and of which the authors were not previously aware. This returned a further six papers and one home office report (Engineer et al., 2003). Seven were discarded as PL did not form the primary unit of analysis. Next, a quality-control measure for excluded papers was built into the selection process, derived from Cormack (1996), which is presented in Table 1. One paper was

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RESULTS

Summary of findings from US Studies

Most work in the USA has focused upon college and high school students and the findings are summarized in Table 3. In all groups of students PL was associated with prolonged and greater drinking and more at-risk behaviours (e.g. Paves et al., 2007).

The study with the largest sample size (Paschall and Saltz, 2007) found that PL was associated with attending parties and greater overall drinking—i.e. it was not a substitute for later drinking however alcohol consumption levels were low. Glindemann et al. (2006) tested blood alcohol levels of bar attendees; 70% reported PL, and had higher levels of intoxication and later drinking compared with those who only drank at a bar. The finding that PL was associated with greater levels of intoxication and other high-risk behaviour has been a consistent finding throughout the literature (e.g. Pedersen and La Brie, 2007) and one study reported an association with black-outs (LaBrie et al., 2011).

A measuring tool tested the motives for PL and loaded upon three factors: inebriation/fun, instrumental motives and social ease (Bachrach et al., 2012). This was consistent with Read et al. (2010) where the reasons for PL were cost and obtaining alcohol below the legal age (21). Pedersen and La Brie (2008) confirmed the findings concerning cost but another motive was ‘to make the night more interesting’. Males were more likely to mention using PL as a way of meeting members of the opposite sex. Studies with predominantly female students (Pedersen et al., 2009; Dejong et al., 2010) have shown positive alcohol expectancies were associated with a greater likelihood of PL and a narrowing of consumption patterns (LaBrie and Pedersen, 2008), but both sexes tend to overestimate the amount of PL and overall drinking of their peers (Pedersen and La Brie, 2008).

In Zamboanga et al. (2010, 2011) older age and being male was associated with greater drinking and PL. In high school students (age range 14–18). For college students the relationship was not as clear. There is a trend for greater PL below the age when alcohol can be purchased legally (21) (Paschall and Saltz, 2007; Read et al., 2010); however, Pedersen et al. (2009) found no relationship between PL and age, gender or ethnicity. Most studies suggested a link between PL and taking part in drinking games in both college students (e.g. LaBrie et al., 2011) and high school students (Kenney et al., 2010; Zamboanga et al., 2011). Borsari et al. (2007) found they were separate constructs and PL predicted intoxication but taking part in drinking games did not, though their sample were students mandated for alcohol-related offences. Mandated students have either breached an alcohol-related policy or experienced a medical incident related to alcohol and, subsequently, have to attend some form of alcohol treatment—usually a group programme. Kenney et al. (2010) provided an excellent summary of different types of drinking games.

Non-college studies

Two studies have investigated PL in predominantly non-college samples. Reed et al. (2011) randomly selected 1040 ‘young adults’ who drank at 32 bars in a city in Southern California. They were surveyed and breathalysed on entry into and exit from the club. Their findings confirmed the majority of trends from college studies, in particular that PL was associated with heavy drinking and that drinking intentions predicted the level of alcohol consumption and intoxication. Miller et al. (2005) surveyed the alcohol and drug use of 240 participants when attending music events at night clubs—over half of their samples were non-students. Sixty per cent drank alcohol before admission; however, the methodology did not investigate where the alcohol was drunk prior to entering the club.
<table>
<thead>
<tr>
<th>Title: Bachrach et al. (2012)</th>
<th>Sample Size: Stage 1 (Item Generation) 43 Stage 2/3 527</th>
<th>Demographic characteristics of Sample</th>
<th>Location of Study</th>
<th>Study Methodology</th>
<th>Measures Used</th>
<th>Type of Drink/ Drinking Pattern</th>
<th>Main Findings</th>
</tr>
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<tbody>
<tr>
<td>College Students: Stage 1 (74% male) Stage 2/3 (50% males)</td>
<td>Buffalo, New York</td>
<td>Focus Groups and testing of Pregaming Motives Measure (PGMM)</td>
<td>Random selection. Internet Survey</td>
<td>PGMM</td>
<td>Type of Drink: Not Stated. Drinking Pattern: Not Stated.</td>
<td>Loaded on factors: Inebriation/Fun Instrumental Motives Social Ease</td>
<td>1. The following were the percentages of PL# in different ethnic groups. White (60%), Hispanic/Latino (52%), African American (44%), and APIA (37%). 2. Hispanic/Latino students who PL had the same frequency and consumption levels as white students. 3. Females in all ethnic groups were more likely to PL in mixed gender groups. 4. PL was associated with greater alcohol consumption and alcohol-related harms.</td>
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<tr>
<th>Title: Paves et al. (2012)</th>
<th>Sample Size: 4351</th>
<th>Demographic characteristics of Sample</th>
<th>Location of Study</th>
<th>Study Methodology</th>
<th>Measures Used</th>
<th>Type of Drink/ Drinking Pattern</th>
<th>Main Findings</th>
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<tbody>
<tr>
<td>College Students: 60% Females Mean Age = 19.86 (SD = 1.36) 50% White 28% Asian Pacific Islander Americans (APIA) 8% Hispanic/Latino 3% African Americans. 11% Others 2%</td>
<td>Two West Coast Universities. One large public. One mid-sized private.</td>
<td>Random selection. Internet Survey</td>
<td>1. Pre-partying Behaviour. 2. Daily Drinking Questionnaire (DDQ) (Collins et al., 1985) 3. Rutgers Alcohol Problem Index (RAPI) (White and Labouvie 1989)</td>
<td>1. Mean number of PL days over past 30 days; Males: 5.09; Females: 3.81. Mean number of drinks when PL: Males 4.36; Females: 2.99. Mean number of drinks when in single gender groups: Males: 3.86; Females: 2.72. Mean number of drinks when in mixed gender groups: Males: 4.13; Females: 3.06. Heavy Episodic Drinking: (HED) * Prevalence not reported. Drinks when PL: Shots (70%), Beer (55%), Wine (15%), Mixed (55%). 55% PL 2-5 days over the last 30 days. HED – 35%, Males and 29%, Females (Not restricted to PL).</td>
<td>1. 25% students reported blacking out after PL within past month. 2. The following had significant relationship with blackouts: a) Greek affiliation, b) family history of alcohol abuse, c) frequency of PL, d) drinking games and consuming shots when pre-partying. Males drink more when PL and this effect is heightened as the number of PL days are increased.</td>
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<tr>
<th>Title: La Brie et al. (2011)</th>
<th>Sample Size: 2,546</th>
<th>Demographic characteristics of Sample</th>
<th>Location of Study</th>
<th>Study Methodology</th>
<th>Measures Used</th>
<th>Type of Drink/ Drinking Pattern</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>58% Female 58% Caucasian, 20% Asian/American 63% below aged 21.</td>
<td>Los Angeles, California</td>
<td>Online Questionnaire</td>
<td>1. Socio Demographic 2. Measures of Pre-partying behaviour/ Link to Blackouts. 3. Typical Alcohol Use Behaviour 4. DDQ</td>
<td></td>
<td>1. Mean number of drinks when PL: Males 4.36; Females: 2.99. Mean number of drinks when in single gender groups: Males: 3.86; Females: 2.72. Mean number of drinks when in mixed gender groups: Males: 4.13; Females: 3.06. Heavy Episodic Drinking: (HED) * Prevalence not reported. Drinks when PL: Shots (70%), Beer (55%), Wine (15%), Mixed (55%). 55% PL 2-5 days over the last 30 days. HED – 35%, Males and 29%, Females (Not restricted to PL).</td>
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<tr>
<th>Title: Zambounga et al. (2011)</th>
<th>Sample Size: 233</th>
<th>Demographic characteristics of Sample</th>
<th>Location of Study</th>
<th>Study Methodology</th>
<th>Measures Used</th>
<th>Type of Drink/ Drinking Pattern</th>
<th>Main Findings</th>
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<tr>
<td>High School Students: 51% Female Mean age 16.1 (SD = 1.11) Range: 14-18 76% White</td>
<td>North Eastern US State</td>
<td>Cross-sectional Survey</td>
<td>Measuring Tool designed for the study</td>
<td></td>
<td>1. Mean –current PL- 8.77 v 4.92 not-current PL. HED: Prevalence not reported.</td>
<td>1. PL associated with being a) male b)older c) High level of hazardous drinking d) drinking games. 2. Occurred most often at parties and sporting games. 3. Not a substitute for later drinking.</td>
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<tr>
<td>Title:</td>
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</table>
| DeJong et al.  | 112         | Undergraduates from 10 colleges       | Pennsylvania      | Focus Group and Written Questionnaire | 1. Drinking Patterns  
                      |             | 51% Female 82% White               |                   |                                 | 2. Strategic Calculations  
                      |             |                                         |                   |                                 | 3. Consequences  
                      |             |                                         |                   |                                 | 4. Drinking Motives  
                      |             |                                         |                   |                                 |                                                                                       | Distilled spirits particularly popular – minimal smell helps to avoid detection and can be mixed in water bottles.  
                      |             |                                         |                   |                                 | HED: Described as “rapid fire”  
                      |             |                                         |                   |                                 | “line em up and drink em.”  
                      |             |                                         |                   |                                 | HED: 47%, 3 or more occasions over past 2 weeks.  
                      |             |                                         |                   |                                 | (Not restricted to PL).                                                                 |                                                                                       |
| Kenney et al.  | 477         | High School Students: 94% 18 years old 66% Females 59% Caucasian | Los Angeles       | Online Questionnaire to High School students who were followed up in their first month of college | 1. High School Drinking.  
                      |             |                                         |                   |                                 | 2. Pre-Partyting and Drinking Game Behaviour.  
                      |             |                                         |                   |                                 | 3. DDQ  
                      |             |                                         |                   |                                 | 4. Brief Young Adult Alcohol Consequences Questionnaire (B-YAACQ)  
                      |             |                                         |                   |                                 | (Kahler et al., 2005)                                                                 |                                                                                       |
| Read et al.    | 159         | Students from Introductory Psychology classes 52% Female Age 18-24 | Buffalo, New York | Self-report measures of pre-gaming and other drinking variables | 1. Alcohol Use – Time Line Follow-Back (TLFB)  
                      |             |                                         |                   |                                 | Sobell and Sobell (1995)  
                      |             |                                         |                   |                                 | 2. Estimated blood alcohol concentration.  
                      |             |                                         |                   |                                 | 3. Alcohol Consequences (Young Adult Alcohol Consequences Questionnaire (YAACQ)  
                      |             |                                         |                   |                                 | (Read et al., 2006)                                                                 |                                                                                       |
| Zamboanga et al. | 1327       | College Students who reported they drank alcohol (75% Females) Mean Age 20.15: (SD = 3.28) Ethnically diverse sample 57% White | Nine Colleges from across the US | On-line Survey | 1. Pregaming  
                      |             |                                         |                   |                                 | 2. AUDIT (Saunders et al 1993)  
                      |             |                                         |                   |                                 | 3. Drinking Games Participation  
                      |             |                                         |                   |                                 | 4. Alcohol Expectancies – Brief Comprehensive Effects of Alcohol Scale (Ham et al., 2005) |                                                                                       |
|                |             |                                         |                   |                                 |                                                                                       |                                                                                       |
|                |             |                                         |                   |                                 | 1. 65% PL in the past 2 weeks- consuming a mean of 4.9 (SD = 3.1) drinks per session.  
                      |             |                                         |                   |                                 | 2. Positive alcohol expectancies were associated with PL.  
                      |             |                                         |                   |                                 | 3. Heavy drinking predicted PL  
                      |             |                                         |                   |                                 | 4. No demographic variables predicted PL.                                                                 |                                                                                       |
|                |             |                                         |                   |                                 | 1.45% of participants engaged in pre-partyting.  
                      |             |                                         |                   |                                 | 2 PL associated with greater alcohol consumption and at risk behaviours  
                      |             |                                         |                   |                                 | 3. PL and engaging in drinking games in high school was associated with higher drinking and more at-risk behaviours in the first month of college.  
                      |             |                                         |                   |                                 | 1. Two-thirds of the sample PL  
                      |             |                                         |                   |                                 | 2. Younger age was associated with PL.  
<pre><code>                  |             |                                         |                   |                                 | 3. Reasons for PL were saving money and obtaining alcohol when under 21.                                                                 |                                                                                       |
</code></pre>
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<tr>
<th>Study</th>
<th>Sample Size</th>
<th>Gender Distribution</th>
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<th>Setting</th>
<th>Survey Method</th>
<th>Variables/measures</th>
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<tr>
<td>Pedersen et al. (2009)</td>
<td>444</td>
<td>57% Female, 43% Male</td>
<td>19.51 (1.36)</td>
<td>Washington and other campuses across the US</td>
<td>On-line Survey</td>
<td>Drinking frequency and quantity in past one month. Types of Drink: Not Stated. Number of days PL over 30 days, no difference between Males and Females (Mean 3.38, SD= 3.64). Males drank more than Females when PL. Males (4.68, 2.12, Mean, SD); Females (3.26, SD = 1.50) p &lt; 0.001. HED: Prevalence not reported.</td>
</tr>
<tr>
<td>Pedersen and La Brie (2008)</td>
<td>524</td>
<td>51% Female, 49% Male</td>
<td>19.37 (1.31)</td>
<td>Los Angeles</td>
<td>On-line Survey</td>
<td>Drinking frequency and quantity in past one month. Types of Drink: Not Stated. Mean 2.71 (SD = 3.50) days spent PL over past 30 days: Males (3.07, 3.71, Mean, SD); Females (2.48, 3.34, Mean, SD). Drinks on PL occasion: Mean 3.91 (SD = 1.94), Males (4.76, 2.14, Mean, SD); Females (3.29, 1.51, Mean, SD). HED: Prevalence not reported.</td>
</tr>
<tr>
<td>Paschall and Saltz (2007)</td>
<td>10,152</td>
<td>Majority under 21</td>
<td>California</td>
<td>California</td>
<td>Web-based or mail survey</td>
<td>Questions concerning drinking before and after events such as sporting events and different types of student parties. Alcohol Expectancies</td>
</tr>
<tr>
<td>La Brie and Pedersen (2008)</td>
<td>238</td>
<td>60% Female, 40% Male</td>
<td>19.51 (1.32)</td>
<td>Los Angeles</td>
<td>Online survey</td>
<td>Drinking frequency and quantity in past one month. Types of Drinks: Not Stated. Rapid binge drinking patterns reported: Leading to greater risk for female students. When PL: Mean number of drinks, Males (4.85, SD = 2.61) v Females (3.45, SD= 1.91) p &lt; 0.001. HED: Prevalence not reported.</td>
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<tr>
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<tbody>
<tr>
<td>Pedersen and La Brie (2007)</td>
<td>227</td>
<td>College students on introductory psychology courses 60% Female Mean Age 19.05 years (SD = 1.18)</td>
<td>Los Angeles</td>
<td>On-line survey</td>
<td>1. Questions relating to Drinking behaviour 2. RAPI 3. DMQ 4. TLFB</td>
<td>Male students preferred beer while PL. Females preferred shots of liquor. Females also more likely to have a mixed pattern of drinking PL associated with HED for both genders. 72% Male and 68%, Female events involved HED. For both genders - 80% of all PL occasions involved HED. Number of drinks on a PL day. Males (8.15, 3.91, Mean, SD), Females (5.76, 2.83, Mean, SD) PL associated with greater drinking for both genders.</td>
<td>1. 45% male student events and 55% of events involved PL in past month. 2. Associated with more all day drinking and adverse alcohol consequences. 3. Minimal gender differences in reasons stated for PL. 4. PL associated with social reasons for drinking</td>
</tr>
<tr>
<td>Borsari et al. (2007)</td>
<td>334</td>
<td>Mandated students who had been referred for an alcohol violation. 63% Male 95% Caucasian 66% Freshmen Mean Age 18.6 (SD = 0.86)</td>
<td>Providence – Rhode Island</td>
<td>Survey as part of a larger Randomised Controlled Trial</td>
<td>1. Alcohol and Drug Use Measure (Borsari and Carey 2000) 2. B-YAACQ- 3. Event Description Measure (Monti et al., 1999)</td>
<td>PL associated with high BAL. Drinking frequency during previous month Number of days. Mean 11.0 (SD = 6.36) PL significantly more than non PL (p = 0.05). Heavy drinking days for PL, Mean 8.62 (SD = 4.93). Difference between PL and Non-PL - not significant. Typical number of drinks per occasion for PL. Mean 7.43 (SD= 3.02). Difference between PL and Non-PL - not significant. HED: Prevalence not reported.</td>
<td>1. PL and taking part in drinking games are separate constructs. 2. PL was a unique predictor of intoxication.</td>
</tr>
<tr>
<td>Glindermann et al. (2006)</td>
<td>1,528</td>
<td>Pedestrians in a downtown area 72% Male 85% Students Mean Age 21.8 (Range 18-59)</td>
<td>Blacksburg, Virginia</td>
<td>Blood Alcohol Levels (BAC) collected by breathalyzer</td>
<td>1. BAC 2. Downtown Drinking Questionnaire designed for the study.</td>
<td>Types of Drink: Not Stated. PL associated with HED. HED: Prevalence not reported.</td>
<td>1.69% reported PL and going out to a bar. 2. PL and consuming alcohol in a bar associated with higher levels of intoxication compared to front-loading or bar only. 3. No relationship between PL and legal age of drinking, i.e. 21. 4. Males PL more than women and consumed more alcohol in bars.</td>
</tr>
</tbody>
</table>

# PL includes, pre-loading, pre-gaming, front-loading, and pre-partying.
* HED defined as 5 or more US drinks on one occasion:- Males and 4 or more drinks on one occasion:- Females (O’Malley and Johnson, 2002).
Burger et al. (2011) conducted a small-scale study of \( n = 89 \) female students to examine the impact of being given normative PL information. Data were collected at baseline and participants assigned to one of three conditions: (a) control (b) normative only and (c) gender-specific norms. There was a tendency to overestimate PL consumption and being provided with normative information was associated with less PL; this was marked in group c.

UK pre-loading studies

The main findings are presented in Table 4. The samples tended to be small and to use qualitative methodologies, whereas the US studies utilized more surveys with online data collection being the favoured method. The majority of US studies were from college populations; in contrast the UK studies tended to be concerned with the impact of PL when entering the night-time economy (NTE). A consistent finding in both the US and UK studies was that PL was associated with excessive drinking, intoxication and adverse alcohol-related consequences.

Barton and Husk (2012) found a shift from ‘pub-club’ to ‘home-pub-club’ drinking and significant ‘flash-points’ for violence such as when waiting to go into a club when PL entered the NTE. Hughes et al. (2008) found that PL was associated with more alcohol consumption, greater chances of getting into a fight and being sexually molested. PL and ‘Post-loading’ was also described by Engineer et al. (2003). Post-loading is drinking at home after having been to a pub or club. The post-loading discussion referred to female interviewees who described going to strangers’ houses and taking part in at-risk sexual behaviour that they would not have done if they had not been drinking.

Although the UK works have tended to use methodologies that make generalizable conclusions difficult, unlike the US studies they have considered groups other than college students; however, a study with university students in the UK found a PL prevalence rate of 60% (Hammersley and Ditton, 2005). Ritchie et al. (2009) found that PL and general drinking behaviour changed on leaving university as the students started work and took on greater responsibilities. The participants described two types of PL, first ‘yarding’, which is drinking a bottle of wine in one go, and second drinking at home to promote safety by reducing the amount consumed. PL was more common in non-graduates and older graduates and although cost was a factor for the older groups (24–29 years), the opportunity to socialize in a quiet environment with friends was also important. Holloway et al. (2008) surveyed PL patterns in a group of residents representative of 2001 census data (i.e. older profile than Ritchie et al., 2009), 40% described PL and 23% post-loading within the past 7 days. In a semi-structured interview a female interviewee (25–34) reported PL to meet friends and relax before going out. The importance of both these studies is that they confirm that PL is not restricted to young drinkers.

There were two other UK studies conducted with, first, street drinkers (Galloway et al., 2007) and, second, accident and emergency attendees (Boyle et al., 2010). PL was common in street drinkers and the main motivation was cost; most alcohol was purchased in off licences rather than in supermarkets. In Boyle et al. (2010) PL was infrequent in accident and emergency attendees and women were more likely to PL than men.

Pre-loading studies in non-UK/US settings

Three other studies examined the relationship between alcohol consumption/other related problems and PL. A Swiss study (Labhart et al., 2013) asked participants (\( n = 183 \)) young adults (53% women, mean age = 23.31 (SD = 3.1) to record their drinking behaviours via their mobile phones on different evenings (1441 events in total). PL was associated with heavier alcohol consumption and more adverse consequences. Miller et al. (2012) in the ‘Dealing with alcohol-related harm and the night-time economy’ (DANTE) study used secondary data sets from accident and emergency departments and the police, key informant interviews, observation of venues and a community survey in the form of a computer-assisted telephone interview. Bar owners consistently reported PL as a challenge for them in terms of management of intoxicated customers and lost revenues and the report confirmed that ‘drinking before going out was shown to be a major predictor of harm in the night-time economy’. The same group (Miller, 2013) has published the ‘Patrons Offending and Intoxication in Night-Time Entertainment Districts (POINTED) study. Patrons (\( n = 6804 \)) were interviewed entering bars and clubs between 10 pm and 3 am on Friday or Saturday night in Geelong, Melbourne, Perth, Sydney and Wollongong. Sixty-five per cent reported PL and this was most common in 18–19-year-olds (67%). The main motive for PL was price (61%) though 22% reported PL for social reasons such as ‘fun’ or ‘to catch up with friends’. PL was the strongest predictor of intoxication and encountering harm.

DISCUSSION

The main finding was that for young people PL should be seen as a supplementary form of drinking. Young people who PL are more likely to drink excessively, become intoxicated and encounter more alcohol-related problems than those who do not. Whether this finding extends to older groups is an area for further exploration. PL presents a challenge for policy makers who focus upon price being the main motivation for PL, but the works on college populations in the US and non-graduates in the UK confirm that one of the reasons for PL is to provide an environment for socialization and conversation, and any interventions to reduce this may have to concentrate on replacing it with something equally meaningful. American work is almost exclusively focused upon college and high school students. PL was associated with greater alcohol consumption and alcohol-related harms, and, although a separate construct, an important mediating factor was taking part in drinking games. While one of the drivers for PL is cost, other factors such as meeting members of the opposite sex and socialization are also key. Students tended to overestimate the amount others are drinking during PL but providing normative information reduces PL, especially when gender-specific information is targeted at young women (Burger et al., 2011). It is difficult to generalize the US findings, due to major differences in drinking, university and youth culture and not least because the legal age for purchasing alcohol is 21 years of age (Read et al., 2010). In the US there is a tendency to adopt
Table 4: UK Preloading Studies.

<table>
<thead>
<tr>
<th>Title: Barton and Husk (2012)</th>
<th>Sample Size</th>
<th>Demographic characteristics of Sample</th>
<th>Location of Study</th>
<th>Study Methodology</th>
<th>Measures Used</th>
<th>Type of Drink/ Drinking Pattern</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>597 Arrestees</td>
<td>Age Range 17-55</td>
<td>Plymouth</td>
<td>1. Questionnaires delivered by police officers-</td>
<td>Structured questionnaire concerning the relationship between drinking patterns, violence, and commission of presenting offence.</td>
<td>Lager/ Vodka and Wine (though different amounts not reported).</td>
<td>1. There is a shift from “pub-club” to “home-pub-club” drinking. 2. PL was associated with excessive drinking and individuals being intoxicated before entering the Night-Time Economy (NTE) 3. PL was associated with violence and flash points whilst attempting to get into a club/bar or at a taxi rank. 4. Cost is a driver for PL 5. Average spent per night £50- PL ranged from £6-15. 6. Most preloaders enter the NTE 10.30-11.30. and drink heavily</td>
</tr>
<tr>
<td>Boyle et al. 2010</td>
<td>1,079</td>
<td>58% Male, Mean Age: 32 (Range 16-84)</td>
<td>Cambridge</td>
<td>Cross-sectional survey at peak times in an Accident and Emergency (A&amp;E) department</td>
<td>1. Screening question. 2. Question whether alcohol consumed within past 6 hours. 3. Where alcohol was drunk prior to presentation at A&amp;E</td>
<td>Alcohol Consumption Levels and Patterns:</td>
<td>1. 15% suffered an alcohol related problem. 2. PL was not associated with A&amp;E presentation. 3. Women (27%) more likely to PL then men (14%).</td>
</tr>
<tr>
<td>Ritchie et al. (2009)</td>
<td>120; 30 in each group</td>
<td>Four groups of young people: 18-23; Undergraduates/ non-graduates at work 24-29; Graduates/ non-graduates in work. Even gender balance</td>
<td>Cardiff</td>
<td>Self administered questionnaires and follow-up interviews with representatives from each group</td>
<td>Questions concerning drinking behaviours and patterns in particular venues of drinking and reasons for choosing them.</td>
<td>Type of Drink: Not Reported.</td>
<td>Drinking behaviour of students changes on leaving university as they enter work and take on responsibilities. 2. Different patterns of PL – a) “yarding” – drinking a bottle of wine in one go b)drinking at home because it is cheap and promotes safety- often only consuming one drink or soft drinks when entering the NTE. 3. Main reasons for PL were cost and getting drunk. 4. Most common in non-graduates across both genders. 5. Older participants saw preloading as an opportunity to socialise with friends in a quiet environment.</td>
</tr>
<tr>
<td>Study</td>
<td>Sample Size</td>
<td>Participants</td>
<td>Methods/Interviews</td>
<td>Findings</td>
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<td>Holloway et al. (2008)</td>
<td>1139</td>
<td>Residents</td>
<td>Stratified random</td>
<td>Quality interview: Female 25-34 described typically at 2pm. “Opening the wine, then the vodka and if we are feeling cheeky a couple of alco-pops before going out and continuing to drink after having been out.” Binge/Heavy Episodic drinking over an extended period. 50% of residents survey drinking over safe limits (34% dangerously over safe limits).</td>
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<tr>
<td>Hughes et al. (2008)</td>
<td>380</td>
<td>Young People</td>
<td>City in the North-West England</td>
<td>Type of Drink: Not Reported. 38% of total nights drinking consisted of PL for Females and 25% for Males. Mean Units consumed when PL: 6.9 (No significant gender difference but females consumed more when PL) Mean Units consumed in bar or night club 16.2. Males consumed significantly more (20.1 (Males) v 12.0 (Females) p &lt; 0.001). Binge Drinking: Described but prevalence rates were not reported. Drinks that were cheap, strong and had a pleasant taste. Such as Buckfast Tonic/Fortified Wine#, White Cider, Strong Lagers (ABV &gt; 8%), Vodka and cheap Whisky. Drinking pattern and amounts not reported though the explicit aim was to get as drunk as possible.</td>
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<tr>
<td>Galloway et al. (2007)</td>
<td>98</td>
<td>Males</td>
<td>Glasgow city and surrounding area</td>
<td>1. PL was frequent and the main reason for this was cost. 2. Most alcohol was purchased off-licenses rather than large supermarkets.</td>
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<tr>
<td>Hammersley and Ditton (2005)</td>
<td>291</td>
<td>University Students</td>
<td>Student Interviewers approached interviewees in city centre licensed premises. Mean time of interview 9pm. Night likely to end at 1am</td>
<td>Type of Drink: Not Reported. Mean number of units drunk before going out: Males 2.76 (SD = 3.25) Females 1.85 (SD = 2.08) not significant. 60% drunk at cut-off for binge drinking (i.e. 4 units) prior to interview 4-5.9 Units: 24% 6-7.9 Units: 12% 8.8.9 Units: 10% 10-19.9 Units: 6% 20+ Units: 1%</td>
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proscriptive solutions that may not be possible in other cultures. These include room searches (in most cultures students are regarded as independent adults and alcohol is a legal beverage for those 18 years or over) and the banning of drinking paraphernalia. In some US circles these restrictions are seen as counter-productive and the Amethyst Initiative (Amethyst Initiative, 2008), an organization of US college presidents and chancellors, has been formed to campaign for a reduction of the age alcohol can be purchased in the US because a ‘culture of dangerous off-campus, clandestine binge drinking has developed’.

Work from the UK has concentrated on the link between PL and entering the night-time economy. PL is associated with greater drinking and more alcohol-related consequences, but it also suggests a complex picture, albeit in studies with small samples and less generalizable methodologies. Ritchie et al. (2009) lay down a challenge for US researchers because the findings indicate that PL behaviours differ markedly on leaving college and university as individuals take on more responsibilities at work and in relationships. Another contribution of the UK literature is to confirm that PL is not just confined to young people. The UK Government (HM Government, 2012) regards PL to be driven largely by price despite the fact that more money was spent in the NTE (Barton and Husk, 2012) and more alcohol was consumed in the NTE than in PL (Hughes et al., 2008). Both the US and UK studies indicate another motivation is to encourage socialization, and while getting intoxicated is frequently one of the aims, this is not always the case, especially in non-college populations. There have also been two large-scale studies from Australia (Miller et al., 2012; Miller, 2013) which confirm the high incidence of PL in young people and the association between PL and encountering harm, but also point out the loss of revenue for bar owners as the practice has become more widespread.

Methodological issues

PL takes place in private and is a difficult subject to research. The studies that have been conducted in the UK can be criticized on the grounds that methods have been used where it is not possible to reach generalizable conclusions. A number of US studies have used randomly selected samples and larger sample sizes but they have almost exclusively been focused upon student populations and, as previously discussed, PL is not restricted to students. Attempts have been made to collect data that allow for participant confidentiality, such as completion of survey data on the Internet (e.g. Paves et al., 2012), but this is based on retrospective recall. A Swiss group of researchers (Labhart et al., 2013) attempted to address this by the use of mobile phone technology. However, both data collected over the Internet and mobile phone are reliant on self-report and the participant may be intoxicated. Thus, one of the chief tasks of researchers is to develop methodologies that collect contemporaneous data that can be corroborated in a robust manner.

Pre-loading in context.

University of Michigan (2012) found that the percentage of individuals who have drunk five drinks in a row at least once over the past 2 weeks has fallen among 8th grade (ages in brackets) (13–14), 10th grade (15–16) and 12th grade (17–18)
students from 1990–2011. Heavy drinking rates in college students have been stable for 30 years but alcohol-related problems have increased (Hingson et al., 2009). We suggest that there are lessons for the US from other cultures. In addition to concentrating on positive and negative alcohol expectancies, it may be beneficial to understand the symbolic importance of alcohol to US college students as in many other cultures consuming alcohol is legal at an equivalent age.

International comparisons as to what constitutes a drink and binge drinking are difficult. In the UK most research studies use the term unit, which is equal to 8 grams of alcohol (Department of Health, 1995). International Center for Alcohol Policies (ICAP, 1998) provides international comparisons for how many standard drinks are included in 500 ml of 5% ABV beer. This is 2.5 in the UK, 1.4 in the US and 2.0 in Australia. PL is seen as an activity undertaken by young people and has been linked with binge drinking. The NHS definition of binge is ‘drinking heavily in a short space of time or to feel the effects of alcohol’ (National Institute of Clinical Excellence, 2011) (NICE). The same guidelines equate this as twice the recommended daily guidelines for sensible drinking—thus the cut-off point for binge drinking in males is 8 units and in females 6 units in one ‘session’ of drinking. For the US the NIAAA (2004) definition of binge drinking is 5 US drinks for males and 4 for females consumed over about two hours. A number of US studies use the term Heavy Episodic Drinking (HED), which has the same cut-off points as the US cut-off levels for binge drinking (O’Malley and Johnson, 2002). In Australia (Australian Government National Health and Medical Research Council, 2011) there is reluctance to provide cut-off points as binge drinking ‘means different things to different people’, but they suggest that a single occasion of drinking constitutes a binge.

There is evidence that young people’s alcohol consumption in the UK is on a downward trend. Health and Social Care Information Centre (2011) show a fall of 14% in 11–15-year-olds who drank alcohol in the previous week, and binge-drinking levels using the UK definitions described previously have also decreased from 2005 to 2010. For women (16–24 years old) the fall was from 27% to 17% (2005) and for men (16–24 years old) the reduction was from 32% to 15% (2005) and to 17% (2010). These trends are reflected in UK universities; a recent newspaper article has dubbed many students ‘The New Puritans’ (McVeigh and O’Neill, 2012)—although it is important to note they have reduced, not stopped, their drinking.

The reasons for these changes are varied; possible explanations are lack of disposable income, and the fact that alcohol now has far more competition for leisure time from other leisure pursuits such as the Internet and social networking, though it is still possible to drink during these activities. There have also been more initiatives such as greater sanctions for selling alcohol to individuals under 18 (in the UK 18 is the legal age to purchase alcohol). Furthermore, public health information and alcohol education may also contribute to this shift. Pubs/bars may be less appealing to young people than in previous generations and no longer provide what many young people want. Research should ascertain what young people mean by socializing and the role alcohol plays in it. To survive, pubs and bars may have to move towards becoming multi-purpose premises and selling just alcohol and food may be of lesser importance than finding other ways of attracting users. Moving towards an Internet café/coffee shop model (especially during day time hours) and a more traditional pub/bar model in the evening may attract users who currently rarely frequent pubs/bars. Licensing authorities could drive this idea forward, assuming that it is regarded as a commercially viable proposition for potential licensees.

The trends reported by McVeigh and O’Neill (2012) are not universal. Warwick et al. (2009) interviewed 82 young people under 18 who confirmed that alcohol was a key factor when socializing with their peers. These findings have recently been confirmed by Percy et al. (2011). Seaman and Ikegwuonu (2010) considered drinkers aged 18–25 using drink diaries and focus groups in a total sample of 80. Excessive alcohol consumption was regarded as the norm and PL was seen as commonplace and being about achieving ‘the right level of drunkenness’ to enjoy the bar or club. Another motivation for PL was ‘to catch up’ in a situation more conducive to conversation, and comments were made concerning a ‘partial resistance to the type of alcohol culture on offer in bars and clubs’. There has also been a focus upon binge drinking, risk and young people in Australia. A report written for Drinkwise Australia (Roche et al., 2008) focusing upon drinkers aged 14–24 found that the main driver of alcohol consumption in this group was ‘pleasure and hedonism’ and that the following were among the factors associated with greater risk: bringing one’s own alcohol, drinking games and PL.

Pre-loading and policy

The UK strategy document (HM Government, 2012) presents itself as focusing upon the problems caused by visible binge drinking though its main headline was the introduction of a minimum unit price (MUP) for alcohol, which is a measure designed to reduce drinking in the general population. This impacts upon PL and one author suggests a target of MUP is home drinking (Foster, 2012). The impact of the MUP is to reduce the price gap between alcohol purchased in the supermarket or off-licence and at the pub/bar or restaurant. The strategy also proposes to consider restricting the sale of discount alcohol and this too is likely to have an impact on PL. Although the level of the MUP is still to be fixed, it is likely to be 45p (UK) (0.53 Euros) (0.68 US$). Not surprisingly, this proposal has been received negatively by many sectors of the alcohol industry and, to date, fierce lobbying has taken place. In July 2013 the Coalition Government announced the MUP and banning multi-buy promotions was no longer government policy in England and Wales. Instead alcohol cannot be sold below the cost of duty and tax (BBC News Politics, 2013a,b). In Scotland a bill has been passed proposing to introduce an MUP of 50p (0.59 Euros, 0.76 US $) though this has not received Royal Assent due to legal challenges from the Scottish Whisky Association (SWA), European Spirits Association (ESA) and EU wine-producing countries, notably Italy, Spain and France (EU) (BBC News Scotland Politics, 2012). The legal challenge from SWA, ESA and EU has been rejected (Judiciary of Scotland, 2013) and they are now appealing against this decision at the European Court of Justice.

A form of MUP has been in operation in British Columbia (Canada) and an evaluation tracking prices changes from 1989–2010 found that a 10% price increase reduced alcohol consumption by 3.4% and was associated with a 32%
reduction in alcohol-related deaths (Stockwell et al., 2012; Zhao et al., 2013). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) has called for an initiative to address binge drinking in US colleges and universities (including PL and drinking games) (NIAAA, 2002). It stresses the importance of a continuing research programme and designing interventions that are based on scientific evidence. The Australian Ministerial Council on Drug Strategy (2006) has produced a National Alcohol Strategy (now operational until 2011). It is a result of collaboration between the Australian government, non-governmental organizations, the alcohol industry and wider community and has four main aims: reduction of intoxication, enhancing public safety, improving community and individual health outcomes, and developing a healthier culture surrounding alcohol. Australian Government Preventative Health Taskforce (2008) builds upon this and stresses addressing the ‘binge drinking epidemic’ in young people, whom it defines to be in the age group 12–24, and there is now a ‘National Binge Drinking Strategy’ (Australian National Preventative Health Agency, 2008). The two reports referred to earlier (Miller et al., 2012; Miller, 2013) have included findings concerning PL and are part of a body of work designed to address the Australian binge-drinking culture.

**Future research**

Price considerations are of importance but they are not the sole driver for PL, and motivations such as providing a space for socializing (that by implication is not provided by pubs/bars) may be of equal importance. To understand PL, it has to be seen within the changing cultural context within which it is taking place, and the priority of researchers should be to understand what different groups want when socializing. This should include further research on how pubs can be designed and run so that they become attractive and safe places for all potential users but especially for young people. Bremner et al. (2011) have confirmed the importance of parents as role models to promote responsible drinking practices in young people. Research should investigate whether ‘intelligent pre-loading’ could be promoted by involving parents or other adults.

Drinking patterns and the types of drink consumed are likely to be associated with different age groups, genders and the likelihood of encountering risks. Few papers reported the type of drinks being consumed and while statements were made about binge drinking or HED, the prevalence was rarely reported. Another frequent omission was the length of time of the drinking episode (both PL and later drinking). It should be standard practice to collect information concerning the beverage type and prevalence of binge drinking/HED and length of time of the drinking episodes in PL studies.

Although PL is assumed to be associated with binge drinking, the study with the largest sample (Paschall and Saltz, 2007) reported comparatively low alcohol consumption levels. While PL is most commonplace among young people, it is not restricted to young people, and future work should be expanded beyond the UK, US and Australia and across different age bands. Gender is also an area that should be investigated in greater depth as there is some evidence that PL is more popular in females (Hughes et al., 2008) and this effect may be even more pronounced in the 30-yearplus groups (Holloway et al., 2008). Finally, much of the work that has explored PL and young people’s drinking in general has used qualitative methods. Drinking in young people is complex and there appears to be many subgroups with differing patterns. While the drive towards obtaining in-depth data is to be applauded, it risks providing information that may not be generalizable. There is also a need to conduct robust surveys that capture drinking and PL behaviours in larger, preferably randomly selected samples.

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