

## USC RESEARCH BANK

<http://research.usc.edu.au>

This is the author's accepted version of the following publication:

Raciti, M, O'Hara, R, Sharma, B, Reinhard, K, Davies, F (2013) Examining price promotions, venue and place of residence as predictors of alcohol consumption, *Journal of Social Marketing*, 3:1, pp.8-27.

DOI:10.1108/20426761311297207

### PERMISSIONS

Permission has been granted by the copyright holder to deposit this author accepted version as Open Access in the USC Research Bank. Open Access research is digital, online and free of charge, and is made possible by the consent of the author or copyright holder.

This is the author's version of a work that was accepted for publication in *Journal of Social Marketing*. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in *Journal of Social Marketing*, 3:1, pp. 8-27. DOI:10.1108/20426761311297207

## **Examining price promotions, venue and place of residence as predictors of alcohol consumption**

### **ABSTRACT**

**Purpose** — The purpose of this study was to understand the effect of price promotions, venue and place of residence on low-risk, risky and high-risk alcohol consumption behaviour of young women between 18 and 24 years of age who attend university in Australia, Wales and Germany.

**Methodology** — Our quantitative, self-administered questionnaire collected data from a convenience sample of three universities in three OECD countries with high alcohol consumption being: a regional Australian university ( $n = 305$ ), a city Welsh university ( $n = 354$ ) and a rural German university ( $n = 325$ ).

**Findings** — First, the multinomial logistic regression results revealed that price promotions and venue influenced alcohol consumption in Wales alone while place of residence influenced alcohol consumption in Australia; however, price promotions, venue and place of residence had no effect on young women attending university in Germany. Second, the binomial logistic regression results for Wales reported a sensitivity to price promotions for all three alcohol consumption risk classifications; however, location was of little consequence to risky drinkers when compared to high risk drinkers. For Australia, the place of residence did not influence alcohol consumption for both risky and high-risk drinkers.

**Value** — The value of our study lies in the examination of three levels of alcohol consumption — low-risk, risky and high-risk — for the same cohort across three countries using the same test instrument and standard alcohol consumption metrics. As such, our study provides a more meaningful macro view of alcohol consumption; thus has the capacity to contribute to effectual intervention strategies.

**Keywords** — Social marketing, alcohol consumption, price promotions, venue, place of residence university students, young women

**Classification** — Research paper

## **Introduction**

The application of marketing theory to social causes, such as binge drinking, has the potential to bring about benefits to the quality of people's lives and society as a whole (Andreasen, 2006; Bagozzi, 1975; Donovan, 2011; Kotler and Zaltman, 1971). Today, binge drinking among young women is one of the public health issues dominating social marketing. The adverse consequences of excessive alcohol consumption are widespread with repercussions not only for the individual but for society at large (Rehm *et al.*, 2009; World Health Organisation (WHO), 2011). Drinking cultures, levels and patterns of alcohol related problems vary across countries (Plant *et al.*, 2009). For example, in Australia nearly 25% of the general population are likely to develop some form of drinking problem during their lives (O'Brien, 2010). Alcohol misuse is one of the leading preventable causes of death (Courtney and Polich, 2009) with alcohol abuse costing billions of dollars each year in health services worldwide (Collins and Lapsley, 2008; McDonald and Webster, 2010). Along with health problems, alcohol abuse can lead to negative consequences such as assaults, accidental injuries, aggression, legal problems, hospitalisations, drink driving, vandalism, suicide and other social problems (Chatterji *et al.*, 2004; Kraus *et al.*, 2009; Rehm *et al.*, 2009; WHO, 2011).

Research tells us that risky alcohol consumption is prominent among three cohorts, namely a) young adults between the ages of 18 and 24 years; b) university students; and c) young women (Australian Institute of Health and Welfare (AIHW), 2004, 2005; Chikritzhs *et al.*, 2003; Leung, 2003; Wechsler *et al.*, 2003; WHO, 2011). Our study amalgamates these cohorts, focusing on alcohol consumption among young women between the ages of 18 and 24 years who attend university.

The literature suggests that alcohol has emerged as a serious public health issue in many countries. Consequently, a large number of alcohol-related studies are available that

address the complex network of causes and inferences. Despite this plethora of research, drawing meaningful conclusions about specific groups or cohorts from various countries is problematic due to variations in sampling and use of different test instruments. As a consequence, a meaningful picture of alcohol consumption among young women who attend university has not been forthcoming in the literature. The research to date has also centred on the misuse of alcohol. This being the case, our study sought to understand the alcohol consumption behaviour by sampling a specific cohort (young women between the ages of 18 and 24 years who attend university) using the same test instrument across three countries, comparing and contrasting those who engage in low-risk, risky and high-risk alcohol consumption. In particular, our social marketing study examined the effect of price promotions, venue and place of residence on the alcohol consumption behaviour of this cohort.

Women's drinking behaviour emerged as an issue in the 1980's (Beckwith, 1987) and is problematic among female university students (Gutgesell *et al.*, 2003). Women are considered more susceptible to alcohol-related harm than men which can be attributed to biological/physical differences (Bongers *et al.*, 1998; Zamboanga and Ham, 2008; Yeh *et al.*, 2006). It has been noted that women suffer the risk of health problems such as breast cancer, infertility, complications with pregnancies, diabetes, heart disease and liver disease with alcohol abuse (Blume and Resor, 2007).

The three countries of interest are Australia, Wales and Germany. Australia is one of the Top 30 alcohol consuming countries in terms of overall per capita consumption (Preventative Health Taskforce, 2008). Australian women over 15 years of age who engage in heavy episodic drinking total 2.6% of the population (WHO, 2011) and while the national legal minimum age for alcohol sales and consumption is 18 years (WHO, 2011), alcohol consumption is known to begin much earlier (AIHW, 2008).

In Wales, 9% of women drink either every day or most days, and around 4,500 females are admitted to hospital each year for reasons related to alcohol (Gartner *et al.*, 2009). Drinking in Wales commences in the early teenage years with Moore *et al.* (2010) reporting that Wales is in the Top 13 countries for weekly drinking at the early age of 11 years. Women's alcohol consumption has become an area of concern in Wales that is thought to be influenced by social changes including wider acceptance or public drunkenness of women and the growing affordability of alcohol (Alcohol Concern Factsheet, 2009). Alcohol dependence is most prevalent amongst Welsh students (IAS Factsheet, 2010) with the national legal minimum age is 16, as it is in Germany.

Germany is the fifth heaviest alcohol drinking nation in Europe, with alcohol highly accessible across a wide variety of retail outlets (Health, 2006). Social marketing campaigns aimed at alcohol misuse have met with limited success in Germany (Wettstein *et al.*, 2012). Similar to Wales, the legal minimum age of alcohol consumption is 16 (WHO, 2011), however drinking starts at an early age with 7% of the 12 to 14 years old drinking weekly (Fritzsche, 2007). Women over 15 years of age who were identified as heavy episodic drinkers total 2.2% of the population (WHO, 2011), slightly less than in Australia. Australia, Germany and Wales have no legally binding regulations on alcohol sponsorship, however all three countries regulate alcohol advertising (WHO, 2011).

This paper is structured in the following manner. A review of the relevant literature is provided and hypotheses stated. Next, the method which included a self-administered quantitative survey is detailed and the results of the logistic regression are reported. Finally, conclusions are drawn, implications outlined, limitations noted and future research is suggested.

## **Social marketing**

What social marketing is, the goals it seeks to achieve, possible approaches and where its parameters lay are at present the focus of much dialogue, debate and deliberation (see Andreasen and Kotler, 2007; Donovan, 2011; Hastings, 2012; Hastings and Angus, 2011; Kotler and Zaltmann, 1971; Lefebvre, 2011; Spotswood *et al.*, 2012). The selling of commercial products and services and the marketing of healthier behaviours have much in common; however there are also many differences (Meffert *et al.*, 2008). Bruhn (2007) and Kannengieier and Schnee (2007) identify that the key difference between social marketing and other areas of marketing is the underlying motivation. The social marketer's objective focuses on social welfare whereas for all others, the marketer's objective is the wellbeing of the organisation in terms of sales, profits, donations or image. Social welfare underpins social marketing and, while focused on the wants, needs, aspirations, lifestyle and freedom of choice of people, it seeks to generate aggregated behaviour change (Lefebvre, 2011). Social marketing is often more complex than commercial and not-for-profit marketing and involves more than mass media or public education campaigns (Grier and Bryant, 2005), however there remains no universally agreed definition of social marketing (McDermott *et al.*, 2005).

The origin of social marketing stems from the discipline of commercial marketing. Wiebe (1952) wondered whether brotherhood could be sold in the same way as soap and he reached the conclusion that society's aspirations would be able to benefit from applying commercial marketing methods. Behavioural change is the measure of success in any social marketing (Andreasen, 2002; Donovan, 2011) irrespective of whether the change is a result of an upstream approach, a downstream approach or a hybrid of both approaches that takes advantage of their symbiotic interplay (Hoek and Jones, 2011). In order to change behaviour, knowledge of the current misbehaviour is an essential platform. As such, this study sought to investigate the effect of price promotions, venue and place of residence on low-risk, risky and high-risk alcohol consumption. Literature pertaining to each is discussed next.

## **Price promotions and alcohol consumption**

Studies have shown that *price promotions* can encourage alcohol consumption (Elder *et al.*, 2010; Skidmore and Murphy, 2011; WHO, 2011). Simply put, the fundamentals of economics apply in that the Law of Demand is operating (Marshall, 1920) with a consistent inverse relationship between price promotions and alcohol consumption that is apparent over time and across countries, irrespective of study design and analytical approach (Elder *et al.*, 2010; Rabinovich *et al.*, 2009). Indeed, this evidence underpinned the Australian Federal Government's 2008 'Alcopops' tax legislation that saw standard drink consumption per week reduced by 720,000 less standard drinks within 12 months (Roxon, 2009).

The level of alcohol consumption is influenced by alcohol price promotions and linked to this is personal income. Research tells us that higher levels of spending money (or disposable income) that is available to university students is associated with higher levels of alcohol consumption and also with university students' experiences with alcohol-related consequences from their own drinking behaviour (Martin *et al.*, 2009). However, having more spending money could also lead to the consumption of more expensive alcohol rather than higher levels of alcohol consumption (Delaney *et al.*, 2007). The previous studies therefore reveal mixed outcomes regarding the relationship between quality of alcohol, price promotions of alcohol and alcohol consumption. As part of an intervention strategy, the literature suggests that restricting alcohol price promotions, such as discounts and multi-buys, will effectively reduce the level of alcohol consumption (Collins and Lapsley, 2008).

Overall, previous research has established that riskier levels of alcohol consumption are linked to price promotions. Thus, this study of three classifications of alcohol consumption of young women from universities in Australia, Wales and Germany proposes that price promotions or discounts are correlated to levels of alcohol consumption. Drawing



from the literature, it is hypothesised that price promotions result in high risk and risky alcohol consumption while the absence of price promotions results in low risk alcohol consumption. Formally stated:

**H<sub>1</sub>:** *Price promotion* is a significant predictor in differentiating between low-risk, risky and high-risk alcohol consumers.

### **Venue and alcohol consumption**

Research indicates that the *venue* in which alcohol is consumed influences consumption (Holloway *et al.*, 2009; Hughes *et al.*, 2011; WHO, 2011); however the relationship between venue and alcohol consumption is complex (Hughes *et al.*, 2011). Australian data indicates there is a tendency to consume alcohol in an individual's own home (80.5% of Australian drinkers) (AIHW, 2008). Other popular locations include a friend's house (52.6%), licensed premises (50.3%), restaurants/cafés (50.3%) and private parties (AIHW, 2008).

Alcohol consumption venues tend to vary with age. Australian data indicates that younger drinkers (aged 14–19 years) are more likely to consume alcohol at private parties (AIHW, 2008). In comparison, people aged 20–29 years are more likely to consume alcohol at licensed premises and in their own home, while people over the age of 29 tend to consume alcohol primarily in their own home (AIHW, 2008).

Trends associated with age and venues for alcohol consumption are also evident in other countries. Research conducted by Clapp *et al.*, (2006) found that more alcohol was consumed at private parties with both under age and legal age drinkers' last drinking event being at a party rather than a bar. Individuals of legal drinking age distributed their alcohol

consumption more equally between parties and bars when compared to underage drinkers (Clapp *et al.*, 2006).

Gender differences are also evident in relation to alcohol consumption at various venues. For example, women are less likely to consume alcohol in pubs compared to men (Holloway *et al.*, 2009). Women tended to drink in restaurants or friends' and family's homes with the preferred venue being their own home (AIHW, 2008; Holloway *et al.*, 2009). Younger and urban women tended to drink in more public locations such as pubs, hotels and restaurants in comparison to their older, rural counterparts (Holloway *et al.*, 2009).

Preferred drinking venue has been linked to a variety of drinking outcomes. People who consume most of their alcohol in bars plus other locations (termed 'bar plus' drinkers) are more likely to be involved in drinking rituals, arguments and fights and are more likely to drink drive (Nyaronga *et al.*, 2009). For university students in Canada and Poland, venue has also been linked to the amount of alcohol consumed and different drinking experiences (Siemieniako *et al.*, 2010). The family home tended to be associated with lower levels of drinking and initiation to alcohol (that is, having the first drink of alcohol supervised in the family home) while residential halls had a social context that supported binge drinking, including intensive social interactions, a larger variety of occasions to consume alcohol and greater peer pressure (Siemieniako *et al.*, 2010). Location was associated with different drinking behaviours; for example, drinking at pubs was associated with chatting with friends and relaxing while alcohol served at nightclubs was perceived as a social lubricant to meet new people (Siemieniako *et al.*, 2010).

The extant literature indicates that the relationship between venue and drinking behaviour is not country specific. A Californian study found that university students tended to consume the most alcohol at off-campus parties, then progress to bars/restaurants, fraternity/sorority parties, outdoor settings, residential hall parties and campus events

(Paschall and Saltz, 2007). The relative risk of intoxication is linked to venue with a New Zealand study of university students who reside in residential halls tending to consume alcohol in public environments, and when in such venues were more likely to drink to intoxication (Kypiri *et al.*, 2007).

Overall, previous research from around the world has established that the venue where alcohol is consumed is correlated with levels of alcohol consumption. This being the case, our study of low-risk, risky and high-risk alcohol consumption among young women in universities in Australia, Wales and Germany hypothesises that the more risky levels of alcohol consumption will take place in public venues. Similarly, low-risk alcohol consumption is more prevalent in private venues. Formally stated, we hypothesise that:

**H<sub>2</sub>:** *Venue* is a significant predictor in differentiating between low-risk, risky and high-risk alcohol consumers.

### **Place of residence and alcohol consumption**

Finally, *place of residence* is related to alcohol consumption (O'Hara *et al.*, 2007). University students who continue to live in the parental home are less likely to engage in excessive drinking (Dowdall and Wechsler, 2002; Shim and Maggs, 2005; Siemieniako *et al.*, 2010; White *et al.*, 2008). One explanation for this may be that students living at home are subject to a higher level of parental monitoring. Siemieniako and colleagues (2010) also suggest that the more homogeneous nature of the population in student resident halls or houses is conducive to higher levels of drinking, while students living in the family home are exposed to a wider and more varied range of influences. The transition from high school to university is less stressful for students who continue to live at home; with students moving away from home experiencing stress in establishing their identity in a new and unfamiliar

situation. Subsequently, this stress may lead to an increase in their likelihood to drink in order to cope with this pressure or to fit in with their new peer group (White *et al.*, 2008)

Alcohol consumption studies have examined differences between students who live off-campus versus those who live on-campus. Students living off campus, but not with parents, consume more alcohol than those living on campus, where alcohol was not permitted within halls of residence (Brunt and Rhee, 2008). It is likely that students who are already heavy drinkers would not choose a residence of this type. Furthermore, off-campus students to be more likely than those residing on campus to engage in drink-driving behaviour (Sun and Longazel 2008); with heavier drinkers tending to live independently in on-campus university accommodation (Woods *et al.*, 2009).

Different types of university accommodation have also been associated with variations in drinking behaviours. Students living in fraternity or sorority houses are more likely to be binge drinkers (Wechsler *et al.*, 2000), partly due to the fact that those who are already heavy drinkers are more likely to join fraternities (DeSimone, 2007). Park and colleagues (2009) found that fraternity membership also led to greater increases in drinking as students progressed through college. Comparing residence halls and fraternity houses, these authors also found differences at the individual living unit level. They suggest that the reputation of a particular hall or house as a heavy drinking environment may influence incoming students who were already drinkers to list it as one of their accommodation preferences.

A link between place of residence and alcohol consumption in other types of student residence is also evident, however the extant literature is predominantly from the United States. Fromme and colleagues (2008) found heavier drinkers were more likely to choose to live in private dormitories, where there were fewer resident assistants, than in university dormitories. Zamboanga *et al.* (2009) found that students living in residential halls were more likely to engage in hazardous drinking, and had more positive attitudes toward alcohol (such

as enhancing sociability), than those in house-style residences. So apparent is the link to place of residence, that environmental management intervention strategies have been successful in changing perceptions and decreasing police-reported incidents in United States college campuses (Wood *et al.*, 2009).

Overall, there is compelling evidence that the university student's place of residence is linked to their levels of alcohol consumption. In line with previous studies, this study hypothesises that those independently living 18–24 year old women attending university in Australia, Wales and Germany will consume more alcohol than their counterparts who live in dependent residences such as the family home. Thus:

**H<sub>3</sub>:** *Place of residence* is a significant predictor in differentiating between low-risk, risky and high-risk alcohol consumers.

## **Method**

The self-administered, paper-based questionnaire for this research was refined with assistance from an expert panel ( $n = 6$ ) who assisted with item wording, scaling and questionnaire layout. Additionally, a pilot testing phase ( $n = 45$ ) was undertaken with respondents on the campus of the Australian university, with the data assisting with questionnaire design and facilitating some preliminary assessment of the scales. Data was collected from 18–24 year old female university students at a regional Australian university, a Welsh city university and a rural German university. The participating universities were selected via a convenience sample and the countries chosen were those identified by the OECD (2011) as having high levels of alcohol consumption. Ethics approval was granted at

the Australian and Welsh universities with the participating German university not requiring such clearance for the conduct of research.

To alleviate bias in the reporting of alcohol consumption a standard drinks table developed by the Australian Government's National Health and Medical Research Council (NHMRC) (2001) was included and participants were instructed not to discuss their answers with others while completing the survey. Following provision of an information sheet and obtaining informed consent from the participants, quota sampling was used to ensure data from each age from 18–24 years was equally represented with data collected by positioning data collectors on campus at various days, times, and campus locations. Due to the way the survey was administered, with a combination of respondents being intercepted and others approaching data collectors it was difficult to obtain accurate response rate calculations at all universities. However, for the Australian university, a response rate of 92.7% was recorded.

Our study is similar to others in that collecting self-reported alcohol consumption was the only means by which to gather the data (Harrell, 1997). Indeed, research by Brener, Billy and Grady (2003), Cooper *et al.* (1981) and Dufour (1999) have demonstrated that self-reported methods for alcohol consumption are both accurate and reliable. In our study, respondents were classified as low-risk, risky and high-risk in terms of their self-reported alcohol consumption using the Australian Alcohol Guidelines developed by the NHMRC (2001) and which were used in the Australian National Drug Strategy Household Survey (AIHW, 2005) and which were recently succeeded by new guidelines, it was current at the time of data collection. Specifically, low-risk alcohol consumption is four or less drinks in one session; risky alcohol consumption is five to six drinks in one session; and high risk alcohol consumption is seven or more drinks in one session (AIHW, 2005).

In terms of the Australian sample ( $n = 305$ ), the alcohol consumption of 122 (40.0%) respondents were classified as low-risk; with 75 (24.6%) deemed risky; and 108 (35.4%) as

high-risk. For the German sample ( $n = 325$ ), a total of 195 (60.0%) respondents were classified as low-risk, while 77 (23.7%) were regarded as risky and 53 (16.3%) high-risk in terms of their alcohol consumption. For the Welsh sample ( $n = 354$ ), 131 (37.0%) were classified as low-risk, 167 (47.2%) risky, while the remaining 56 (15.8%) fell into the high-risk category.

Regarding place of residence, respondents were asked '*during the semester where do you live?*'. Responses were collapsed into two response categories — dependent (for example, 'in parents' house') or independent (for example, 'university accommodation'). Australian respondents were relatively equal in their place of residence (dependent = 156; independent = 149); while independent living arrangements were predominant among the German (dependent = 67; independent = 253) and Welsh respondents (dependent = 28; independent = 324).

Venues where alcohol was consumed were organised into private (for example, 'at a friend's house') and public (for example, 'at a night club') settings. Respondents were asked '*where were you when the greatest number of drinks was consumed in the past month?*'. Of those who provided a response, Australian respondents were also relatively equal in terms of their venue of alcohol consumption (private = 131; public = 135); while German (private = 129; public = 180) and Welsh respondents (private=100; public = 238) reported a proclivity for public venues over private venues.

Price promotions was measured with 4 items on a 7-point semantic scale rating from 1 = strongly disagree to 7 = strongly agree. The four items were: a) '*I am more likely to buy alcohol that is on special via a price promotions reduction*'; b) '*I am more likely to buy alcohol that is on a quantity special for example buy two for \$50 or four for \$10*'; c) '*I buy more alcohol when it is on special than when it is a normal price promotions*'; and d) '*I buy alcohol at more than one store to take advantage of low price promotions*'. Factor analysis

confirmed the scale items and a composite variable comprising these four price promotions items was created with Australian loadings ranging from 0.65 to 0.80 ( $\alpha = 0.69$ ); Welsh loadings from 0.66 to 0.82 ( $\alpha = 0.77$ ) and German loadings from 0.67 to 0.75 ( $\alpha = 0.70$ ). Multicollinearity was assessed in accordance with Tabachnick and Fidell (2007) with no violations apparent.

For this research logistic regression was used. Logistic regression is a data analysis technique that allows researchers to predict group membership from any mix of continuous, discrete and dichotomous variables (Tabachnick and Fidell, 2007). Logistic regression techniques do not require each group to be equal in size (Tabachnick and Fidell, 2007). There were no violations of the assumptions of this technique for this study. First, multinomial logistic regression was conducted as there were three groups of alcohol consumption. Second, a series of binary logistic regressions, which typically follows multinomial logistic regression, was conducted with the aim of identifying the salient variables that differentiate between various combinations of the different alcohol consumption groups (Menard, 1995). Results of the multinomial and subsequent binary logistic regressions are shown in Table 1.

TAKE IN TABLE 1 ABOUT HERE

## **Results**

### ***Multinomial logistic regression***

Multinomial logistic regression firstly determined if price promotions, venue and place of residence were significant predictors in differentiating between the three categories of alcohol consumption, namely low-risk, risky and high-risk. Analysis found that the model was significant for the Australian data ( $\chi^2 = 13.45, p < 0.05$ ) and the data from Wales ( $\chi^2 = 78.12, p < 0.05$ ); however this was not the case for the German data ( $\chi^2 = 5.60, p > 0.05$ )



indicating at this initial stage that other factors outside of those measured influence alcohol consumption.

The likelihood-ratio tests ensued to assess if the independent variables contribute to the model, thus could discriminate between the three low-risk, risky and high-risk alcohol consumption. For the Australian data, the likelihood-ratio tests found support for the role of place of residence as a significant predictor of alcohol consumption ( $\chi^2 = 8.64, p < 0.05$ ). There was no support for price promotions ( $\chi^2 = 2.92, p > 0.05$ ) and venue ( $\chi^2 = 2.13, p > 0.05$ ) as significant predictors of alcohol consumption in Australia. Next, the data from Wales was analysed with the likelihood-ratio tests reporting that price promotions ( $\chi^2 = 55.15, p < 0.05$ ) and venue ( $\chi^2 = 14.46, p < 0.05$ ) were significant predictors of alcohol consumption while place of residence was not ( $\chi^2 = 0.46, p > 0.05$ ). Interestingly, this is the opposite of what was found for the Australian cohort. Ratifying the initial multinomial logistic findings, the German data reported no support for price promotions ( $\chi^2 = 3.63, p > 0.05$ ), venue ( $\chi^2 = 0.72, p > 0.05$ ) or place of residence ( $\chi^2 = 1.67, p > 0.05$ ) as significant predictors of alcohol consumption.

Typically, a series of binary logistic regressions follow multinomial logistic regression. For this research, this involved performing three separate analyses on the various combinations of the alcohol consumption across the three countries—namely low-risk versus risky alcohol consumption, low-risk versus high-risk alcohol consumption and risky versus high-risk alcohol consumption. The findings of the binary logistic regressions for each country are reported next.

### ***Binary logistic regression — Australian data***

Commencing with the Australian data, the first binary logistic regression, low-risk versus risky alcohol consumption ( $n = 179$ ) found that the independent variables as a set

reliably distinguished between the two groups ( $\chi^2 = 9.68, p < 0.05$ ). Nagelkerke's  $R^2$  statistic = 0.07 indicates a very low relationship between the independent variables. The Wald criterion confirms that place of residence ( $z = 6.22, p < 0.05$ ) is the only significant predictor for this binary.

The second binary logistic regression compares low-risk alcohol consumption to high-risk alcohol consumption ( $n = 194$ ) finding that independent variables as a set reliably distinguished between the two groups ( $\chi^2 = 9.43, p < 0.05$ ). Nagelkerke's  $R^2$  statistic = 0.06 indicates a very low relationship between the independent variables and grouping variables. The Wald criterion confirms that place of residence ( $z = 5.66, p < 0.05$ ) was the only significant predictor for this binary.

The third binary logistic regression compared risky alcohol consumption to high-risk alcohol consumption ( $n = 159$ ) finding that independent variables as a set did not reliably distinguish between the two groups ( $\chi^2 = 0.34, p > 0.05$ ) with no relationship found between the independent variables and the grouping variable (Nagelkerke's  $R^2$  statistic = 0.00). The Wald criterion confirms there was no significant predictors for this binary.

### ***Binary logistic regression — Welsh data***

For the Welsh data, the first binary logistic regression of low-risk versus risky alcohol consumption ( $n = 286$ ) found that the independent variables as a set reliably distinguished between the two groups ( $\chi^2 = 45.32, p < 0.05$ ). Nagelkerke's  $R^2$  statistic = 0.20 indicates a weak relationship between the independent variables and the grouping variable. Furthermore, the Wald criterion confirms that price promotions ( $z = 26.76, p < 0.05$ ) and venue ( $z = 9.54, p < 0.05$ ) were significant predictors of alcohol consumption for this binary.

The second binary logistic regression examined low-risk versus high-risk alcohol consumption ( $n = 176$ ). The independent variables as a set reliably distinguished between the

two groups ( $\chi^2 = 56.95, p < 0.05$ ). There was a moderate relationship between the independent variables and the grouping variable of alcohol consumption (Nagelkerke's  $R^2$  statistic = 0.40) and the Wald criterion confirms that price promotions ( $z = 27.10, p < 0.05$ ) and venue ( $z = 10.40, p < 0.05$ ) were significant predictors of alcohol consumption for this binary.

The final binary logistic regression for the Welsh cohort compared risky alcohol consumption to high-risk alcohol consumption ( $n = 210$ ). For this binary, the independent variables as a set reliably distinguished between the two groups ( $\chi^2 = 13.73, p < 0.05$ ). There was a very weak relationship between the independent variables and the grouping variable of alcohol consumption (Nagelkerke's  $R^2$  statistic = 0.10) and the Wald criterion confirms that price promotions ( $z = 9.54, p < 0.05$ ) was the only significant predictor of alcohol consumption.

### ***Binary logistic regression — German data***

The multinomial logistic regression was not significant. Nonetheless the series of binary logistic regressions was undertaken to examine in closer detail if any of the combinations of alcohol consumption were significant. For the German cohort, the first binary logistic regression, low-risk versus risky alcohol consumption ( $n = 231$ ) found that the independent variables as a set did not reliably distinguish between the two groups ( $\chi^2 = 3.18, p > 0.05$ ), and there was a weak relationship between the independent and grouping variable (Nagelkerke's  $R^2$  statistic = 0.21). Furthermore, the Wald criterion confirms that no support for price promotions, venue and place of residence as significant predictors of alcohol consumption.

Similar non-significant results were found for the second binary which compared low-risk alcohol consumption to high-risk alcohol consumption ( $n = 249; \chi^2 = 3.21, p > 0.05$ ; Nagelkerke's  $R^2$  statistic = 0.18) with no support for price promotions, venue and place of

residence as significant predictors of alcohol consumption. Furthermore, non-significant results for the final binary ( $n = 120$ ;  $\chi^2 = 1.34$ ,  $p > 0.05$ ; Nagelkerke's  $R^2$  statistic = 0.15) confirmed that price promotions, venue and place of residence could not significantly predict alcohol consumption among the German cohort of young women attending university.

## **Conclusions and implications**

The purpose of this study was to understand the drivers of alcohol consumption behaviour. The literature indicates that a cohort most at risk of excessive alcohol consumption was young women between 18–24 years of age who attend university and three factors were linked to excessive alcohol consumption — price promotions, venue and place of residence. Research in this area is mostly US-centric however we have drawn from research undertaken in various countries where available. These studies have used dissimilar sampling approaches and test instruments making the drawing of conclusions problematic. Furthermore, the research from different studies tended to focus upon those who consumed alcohol irresponsibly.

This study contributes to the literature in a number of ways. We sought to understand the alcohol consumption behaviour by sampling a specific cohort (young women between the ages of 18–24 years who attend university) using the same test instrument across three countries, comparing and contrasting those who engage in low-risk, risky and high-risk alcohol consumption. The design of this study facilitates valid comparison across the three countries of interest providing insight into and isolating country-specific alcohol consumption behaviours. While we do not feel that there are universal drivers of alcohol consumption behaviour for our cohort of interest, our study offers insight that is necessary for effective diagnosis of the drivers of behaviour as the platform for the development and implementation of country-specific intervention strategies that work. This being the case, the following

discussion of the findings centres on each country's results which was a gap in the extant literature.

### ***Findings from multinomial logistic regression***

Findings from the multinomial analysis empirically confirm that place of residence of young women attending university was found to influence alcohol consumption behaviour in Australia but not in Wales or Germany. This finding is in line with other studies conducted around the world using different samples of university students (for example, Shim and Maggs, 2005; Siemieniako *et al.*, 2010 and White *et al.*, 2008) that found that students who continue to live in the parental home engage in responsible alcohol consumption behaviours. Our study confirms that these findings are applicable to our specific cohort of interest, that is young Australian women attending university. Our finding suggests that in Australian intervention campaigns, be they 'upstream' to policy makers, 'downstream' to individuals, or in combination, focus upon young women who live independently, such as in residential colleges or shared houses, would be effectual. For example, education programs or advocacy officers placed in residential colleges highlighting to young women in residence that their alcohol consumption behaviour is in contrast to their counterparts who live in the parental home may be a mechanism to shift perceptions of the group norm.

The second key finding of the multinomial analysis is that the price promotions of alcohol and venue where alcohol is consumed influence alcohol consumption behaviour in Wales alone. This finding for our specific cohort of interest challenges the literature to date where many studies across countries and over time have established that price promotions can both encourage and deter alcohol consumption (for example, Collins and Lapsley, 2008; Elder *et al.*, 2010). The literature pertaining to the relationship between venue and alcohol consumption also provides strong evidence from countries including Australia, United States,

Canada, New Zealand and Poland (for example, Holloway *et al.*, 2009) that alcohol consumption behaviour varies by venue. Our findings suggest that the relationship between price promotions, venue and alcohol consumption behaviour is best not interpreted as universal, with variations between groups in society and between countries to be expected.

Specifically, our findings show us that young Australian and German women attending university are less likely to increase their alcohol consumption as a result of price promotions such as discounts, sales or multi-buy offers which make alcohol seemingly more accessible. Similarly, we draw from this multinomial finding, that young Australian and German women attending university are less likely to change their alcohol consumption behaviour depending on the private or public nature of the venue in which they are drinking. What these findings do relay is that in Wales, young women attending university are likely to adjust their level of alcohol consumption as a result of alcohol price promotions such as discounts. This being the case, this evidence suggests that an ‘upstream’ or Government strategy to monitor alcohol price promotions in Wales would result in meaningful, pro-social changes in the patterns of alcohol consumption for young women attending university. According to our findings such a strategy in Australia and Germany for the specific cohort of interest is unwarranted.

The final finding from the multinomial regression was that price promotions, venue and place of residence had no effect on 18–24 year old women attending university in Germany. The multinomial model for Germany was not significant. This illustrates that low-risk, risky and high-risk alcohol consumption behaviour among young women attending university in Germany is driven by influences outside of alcohol price promotions, public or private venues for drinking or the place of residence of young, female, university students. The German findings are particularly interesting as they eliminate the role of price promotions, venue and place of residence as drivers of drinking behaviour for young women

attending university, even though literature in other countries and other studies has demonstrated the salience of these factors. This finding is valuable as the design of our study means that we are able to draw direct comparisons between Germany, Wales and Australia. Furthermore, as much of the literature on the influence of price, venue and place of residence is US-centric, this finding by contrast evidences that these associations are not applicable in all countries.

### ***Findings from binomial logistic regression***

The findings of the binomial logistic regression offer additional insights into the multinomial logistic regression results. First, when assessing the Australian data the binary of low-risk versus risky alcohol consumption behaviour and low-risk versus high-risk alcohol consumption behaviour is the same as that found for the multinomial logistic regression. This suggests that young Australian women who attend university and who drink responsibly (that is, low-risk) are more likely to live in dependent situations such as the parental home, unlike their risky and high-risk drinking counterparts. Interestingly, for the final binary, risky versus high-risk, the salience of place of residence is not supported. This suggests that young Australian women attending university and who drink at risky and high-risk levels will do so irrespective of whether they live independently or dependently. Thus, their relatively higher consumption of alcohol is not deterred by price promotions, or mitigated by venue or place of residence. Thus, the implication is that other factors drive risky and high-risk drinking for this cohort and social marketing campaigns focused upon price promotions, venue and place of residence will be ineffectual.

The binomial results for Wales show that place of residence were inconsequential to low-risk, risky and high-risk consumption of alcohol by young women attending university, as established in the initial multinomial logistic regression. Importantly though, there was a

sensitivity to price promotions for all three risk classifications. This provides compelling evidence that the consumption of alcohol is linked to the price promotions in Wales (but not so in Australia or Germany). Notably, in Wales there are no legally binding regulations on alcohol sponsorship and sales promotion, indicating that such ‘upstream’ measures have the potential to bring about a change in alcohol consumption behaviour (WHO, 2011). The binary logistic regression shows that high prices will result in low-risk drinking, moderate prices are linked to young women engaging in risky drinking and low prices lead to high-risk drinking. These findings infer that in Wales, young women attending university are inculcated to engage in alcohol consumption, with variations in the amount of alcohol consumed dependent on price promotions. The Welsh findings also reveal that the nature of the venue as a public or private location was of little consequence to risky drinkers when compared to high-risk drinkers, as also found among the Australian and German respondents. As such, education campaigns should address both types of venues, rather than distinguish between them.

All of the binary logistic regression findings for Germany were not significant, confirming the multinomial results that alcohol consumption by young university women in this country were driven by factors other than price promotions, venue and place of residence. On the whole, it can be concluded from these mixed findings that the effect of price promotions, venue and place of residence is country specific, requiring culturally congruent marketing interventions. For example, an ‘upstream’ campaign addressing alcohol price promotions promotion in Wales would be beneficial but would draw limited success in Australia or Germany. The key implication of our study of the same cohort across three countries is that it provides a more meaningful macro view of alcohol consumption; thus has the capacity to contribute to effectual intervention strategies. As much of the literature on alcohol consumption amongst young university students is US-centric, particularly that



related to price promotions, venue and place of residence, our study extends this literature, providing insight into the alcohol consumption in Australia, Wales and Germany.

### **Limitations and future research**

As with all studies, there are a range of limitations with our research that impacts on the generalisability of our findings. Our study investigated the effect of price promotions, venue and place of residence on the self-reported alcohol consumption behaviour of young women between the ages of 18 –24 years attending university. Furthermore, we used alcohol consumption guidelines and metrics from Australia in our cross-sectional study which sought data from students enrolled at a regional Australian university, a Welsh city university and a rural German university. In terms of venue, the variations between the universities locales may influence venue accessibility and this is an acknowledged limitation of the study. Furthermore, convenience sampling was used to select participating universities in countries identified by the OECD as having high levels of alcohol consumption. The low  $R^2$  values for the Australian data suggests that other factors are influencing alcohol consumption, such as reference groups, and as such further research would prove beneficial to developing a fuller picture of influences on young women in Australia who attend university.

Future research that examines the effect of price promotions, venue and place of residence for different cohorts in society, such as those in mid-life, is strongly encouraged. Research that extends our investigation into the factors that drive low-risk versus risky alcohol consumption will provide greater perspective on alcohol consumption behaviour. Furthermore, the replication of this study at other universities in Australia, Wales and Germany, as well as around the world, would be fruitful in advancing our understanding of alcohol consumption.

## References

- Andreasen, A.R. (2002), "Marketing social marketing in the social change marketplace", *Journal of Public Policy and Marketing*, Vol. 21 No. 1, pp. 3–13.
- Andreasen, A.R. (2006), *Social Marketing in the 21st Century*, Sage, Thousand Oaks.
- Andreasen, A.R. and Kotler, P. (2007), *Strategic Marketing for Non-profit Organizations*, 7th ed., Prentice Hall, Jurong.
- Australian Institute of Health and Welfare (AIHW) (2004), "A guide to Australian alcohol data", Australian Institute of Health and Welfare, Canberra.
- Australian Institute of Health and Welfare (AIHW) (2005), "The 2004 National Drug Strategy Household Survey: first results", Drug statistics series, No. 13, Canberra.
- Australian Institute of Health and Welfare (AIHW) (2008), "2007 National Drug Strategy Household Survey: first results", Drug Statistics Series, No. 20, Canberra.
- Australian National Health and Medical Research Council (2001), "Australian alcohol guidelines: health risks and benefits", available at: [www.alcohol.gov.au](http://www.alcohol.gov.au) (accessed 18 November 2005).
- Australian National Health and Medical Research Council (2009), "Australian guidelines to reduce health risks from drinking alcohol", available at: <http://www.nhmrc.gov.au/> (accessed 5 October 2010).
- Bagozzi, R.P. (1975), "Marketing as exchange", *Journal of Marketing*, Vol. 39 No. 4, pp. 32–39.
- Bartels, R. (1974), "The identity crisis in marketing", *Journal of Marketing*, Vol. 38 No. 4, pp. 73–76.
- Beckwith, J.B. (1987), "Developing a perspective on women's drinking behaviour", *Australian Drug and Alcohol Review*, Vol. 6, pp. 227-231.

- Blume, A.W., and Resor, M.R. (2007), “Knowledge about health risks and drinking behaviour among Hispanic women who are or have been of childbearing age”, *Addictive Behaviors*, Vol. 32, pp. 964-967.
- Bongers, I.M.B., Van De Goor, L.A.M., Van Oers, J.A.M. and Garretsen, H.F.L. (1998), “Gender differences in alcohol-related problems: Controlling for drinking behaviour”, *Addiction*, Vol. 93 No. 3, pp. 411-421.
- Brener, N., Billy, J., and Grady, W. (2003), “Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: Evidence from the scientific literature”, *Journal of Adolescent Health*, Vol. 33, pp. 436-57.
- Bruhn, M. (2007), *Marketing: Grundlagen für Studium und Praxis*, 8th ed., Gabler Wiesbaden.
- Brunt, A.R., and Rhee, Y.S. (2008), “Obesity and lifestyle in U.S. college students related to living arrangements”, *Appetite*, Vol. 51, pp. 615–621.
- Chatterji, P., Dave, D., Kaestner, R. and Markowitz, S. (2004), “Alcohol abuse and suicide attempts among youth”, *Economics and Human Biology*, Vol. 2, pp. 159–180.
- Chikritzhs, T., Catalano, P., Stockwell, T., Donath, S., Ngo, H., Young, D. and Mathews, S. (2003), “Australian alcohol indicators, 1990–2001: patterns of alcohol use and related harms for Australian states and territories”, National Drug Research Institute, Curtin University of Technology, Perth.
- Clapp, J., Reed, M. Holms, M, Lange, E., and Voas, R. (2006), “Drunk in public, drunk in private: the relationship between college students, drinking environments and alcohol consumption”, *The American Journal of Drug and Alcohol Abuse*, Vol. 32, pp. 275–285.
- Collins, D.J. and Lapsley, H.M. (2008), “The avoidable costs of alcohol abuse in Australia and the potential benefits of effective policies to reduce the social costs of alcohol”,

- National Drug Strategy, Monograph Services No. 70, Australian Government, Department of Health and Ageing, Canberra.
- Cooper, A., Sobell, M., Sobell, L., and Maisto, S. (1981), "Validity of alcoholics self-reports: Duration data", *The International Journal of Addictions*, Vol. 16 No. 3, pp. 401-406.
- Courtney, K.E. and Polich, J. (2009), "Binge drinking in young adults: data, definitions, and determinants", *Psychological Bulletin*, Vol. 135 No. 1, pp. 142–156.
- Delaney, L., Harmon, C. and Wall, P. (2007), "Behavioural economics and drinking behaviour: preliminary results from an Irish college study", Institute for the Study of Labor (IZA) Discussion Paper, No. 2883, Bonn.
- DeSimone, J. (2007), "Fraternity membership and binge drinking", *Journal of Health Economics*, Vol. 26, pp. 950–967.
- Donovan, R. and Henely, N. (2003), *Social marketing: principles and practice*, IP Communications, Melbourne.
- Donovan, R., 2011, "Social marketing's mythunderstandings", *Journal of Social Marketing*, Vol. 1 No. 1, pp. 8–16.
- Dowdall, G., and Wechsler, H. (2002), "Studying college alcohol use: widening the lens, sharpening the focus", *Journal of Studies on Alcohol*, Vol. 14, pp. 14–22.
- Dufour, M. (1999), "What is moderate drinking? Defining "drinks" and drinking levels". *Alcohol Research and Health*, Vol. 23 No. 1, pp. 5-14.
- Elder, R., Lawrence, B., Ferguson, A., Naimi, T., Brewer, R., Chattopadhyay, S., Toomey, T. and Fielding J. (2010), "The effectiveness of tax policy interventions for reducing excessive alcohol consumption and related harms", *American Journal of Preventive Medicine*, Vol. 38 No. 2, pp. 217–229.
- Fritzsche, L. (2007), Billiger Rausch, in: Zeit Online, No. 13, 22.03.2007, available at <http://www.zeit.de/200713/> (accessed 28 November 2008).

- Fromme, K., Corbin, W.R. and Kruse, M.I. (2008), “Behavioral risks during the transition from high school to college”, *Developmental Psychology* Vol. 44 No. 5, pp. 1497–1504.
- Gartner, A., Cosh, H., Gibbon, R. and Lester, N. (2009), *Alcohol and Health: A Profile of Alcohol and Health in Wales*, Cardiff: Wales Centre for Health.
- Grier, S. and Bryant, C.A. (2005), “Social marketing in public health”, *Annual Review of Public Health*, Vol. 26, pp. 319–339.
- Gutgesell, M.E., Moreau, K.L. and Thompson, D.L., (2003), “Weight concerns, problem eating behaviours, and problem drinking behaviours in female collegiate athletes”, *Journal of Athletic Training*, Vol. 38 No. 1, pp. 62-66.
- Harrell, A., (1997). *The validity of self reported drug use data: The accuracy of responses on confidential self-administered answered sheets*. National institute of drug abuse monograph 167, Available from [www.drugabuse.gov/pdf/monographs/monographs167](http://www.drugabuse.gov/pdf/monographs/monographs167), (accessed 14 March 2006).
- Hastings, G. (2012), “The marketing matrix”, *Journal of Social Marketing*, Vol. 2 No. 3, Emerald Earlycite (accessed 3 August 2012).
- Hastings, G., and Angus, K. (2011), “When is social marketing not social marketing?”, *Journal of Social Marketing*, Vol. 1 No. 1, pp. 45–53.
- Health (2006), *The highs and lows of Germany’s drinking culture*, 18.11.2006.  
<<http://www.dw-world.de/dw/article/0,,2226609,00.html>>, accessed 20 September 2010.
- Heley, J. (2008), “Rounds, Range Rovers and rurality: the drinking geographies of a new squirearchy”, *Drugs: Education, Prevention and Policy*, Vol. 15 No. 3, pp. 315–321.
- Hoek, J., and Jones, S.C. (2011), “Regulation, public health and social marketing: a behaviour change trinity”, *Journal of Social Marketing*, Vol. 1 No. 1, pp. 32–44.

- Holloway, S.L., Valentine, G. and Jayne, M. (2009), "Masculinities, femininities and the geographies of public and private drinking landscapes", *Geoforum* Vol. 40, pp. 821–831.
- Hughes, K., Quigg, Z., Eckley, L., Bellis, M., Jones, L., Calafat, A., Kosir, M., van Hasselt, N. (2011), "Environmental factors in drinking venues and alcohol-related harm: the evidence base for European intervention", *Addiction*, Vol. 1, 37–46.
- Institute of Alcohol Studies Factsheet, (2010), *Excessive and Problem Drinking in England and Wales*, United Kingdom.
- Jayne, M., Valentine, G. and Holloway, S. (2008), "Geographies of alcohol, drinking and drunkenness: a review of progress", *Progress in Human Geography* Vol. 32 No. 2, pp. 247–263.
- Kannengieer, C. and Schnee, C. (2007), "Politisches Marketing", in Bruhn, M., Kirchgeorg, M. and Meier, J. (Eds), *Marktorientierte Führung im Wirtschaftlichen und Gesellschaftlichen Wandel*, Gabler, Wiesbaden.
- Kotler, P. and Zaltman, G. (1971), "Social marketing: an approach to planned social change", *Journal of Marketing*, Vol. 35 No. 3, pp. 3–12.
- Kraus, L., Baumeister, S.E., Pabst, A. and Orth, B. (2009), "Association of average daily alcohol consumption, binge drinking and alcohol-related social problems: results from the German epidemiological surveys of substance abuse", *Alcohol & Alcoholism*, Vol. 44 No. 3, pp. 314–320.
- Kypiri, K., Paschall, M., Maclennan, B. And Langley, J. (2007), "Intoxication by drinking location: a web-based diary study in a New Zealand university community", *Addictive Behaviours*, Vol. 32, pp. 2586–2596.
- Lefebvre, R.C. (2011), "An integrative model for social marketing", *Journal of Social Marketing*, Vol. 1, No. 1, pp. 54–72.

- Leung, C. (2003), "Women hit the bottle", *The Age*, 10 September, available at [www.theage.com.au/articles/2003/09/09/10629092055425.html](http://www.theage.com.au/articles/2003/09/09/10629092055425.html) (accessed 5 August 2005).
- Mc Dermott, L., Stead, M. and Hastings, G. (2005), "What is and what is not social marketing: the challenge of reviewing the evidence", *Journal of Marketing Management*, Vol. 21, pp. 545–553.
- McDonald, T. and Webster, I. (2010), "Alcohol abuse costs \$36 billion a year", *ABC World News*, available at: <http://www.abc.net.au/worldtoday/content/2010/s2991780.htm> (accessed 25 August 2010).
- Maibach, E.W., Rothschild, M.L. and Novelli, W.D. (2002), "Social Marketing", in: Glanz, K., Rimer, B.K. and Lewis, F.M. (Eds.), *Health Behavior and Health Education: Theory, Research, and Practice*, 3rd edn, Jossey-Bass, San Francisco, pp. 431–461.
- Marshall, A. (1920), *Principles of Economics*, 8th edn, Macmillan, London.
- Martin, B.A., McCoy, T.P., Champion, H., Parries, M.T., DuRant, R.H., Mitra, A. and Rhodes, S.D. (2009), "The role of monthly spending money in college student drinking behaviors and their consequences", *Journal of American College Health*, Vol. 57 No. 6, 587–596.
- Meffert, H., Burmann, C. and Kirchgeorg, M. (2008), *Marketing: Grundlagen Marktorientierter Unternehmensführung*, 10th edn, Gabler, Wiesbaden.
- Menard, S. (1995), *Applied Logistic Regression Analysis*, Sage, California.
- Moore, G.F., Rothwell, H. and Segrott, J. (2010), "An exploratory study of the relationship between parental attitudes and behaviour and young people's consumption of alcohol", *Substance Abuse Treatment, Prevention, and Policy*, Vol. 5 No. 6.
- Nyaronga, D., Greenfield, T. and McDaniel, P. (2009), "Drinking context and drinking problems among black, white and Hispanic men and women in the 1984, 1995 and

- 2005 U.S National Alcohol Surveys”, *Journal of Studies on Alcohol and Drugs*, Vol. 70, pp.16–26.
- O’Brien, A. (2010), “A quarter of us abuse alcohol”, *The Australian*, available at: <http://www.theaustralian.com.au/news/health-science/a-quarter-of-us-abuse-alcohol/> (accessed 25 August, 2010).
- O’Hara, R., Harker, D., Raciti, M. and Harker, M. (2007), “Attitudinal, normative and demographic influences on female students’ alcohol consumption”, *Young Consumers*, Vol. 9 No. 1, pp. 7–16.
- Organisation for Economic Co-Operation and Development ‘OECD’, (2011), *Health at a Glance 2011: OECD Indicators*, OECD Publishing.
- Paschall, M, and Saltz, R. (2007), “Relationship between college settings and student alcohol use before, during and after events: a multi-level study”, *Drug and Alcohol Review*, Vol. 26, pp. 635–644.
- Park, A., Sher, K.J. and Krull, J.L. (2009), “Selection and socialization of risky drinking during the college transition; the importance of microenvironments associated with specific living units”, *Psychology of Addictive Behaviors*, Vol. 23 No. 3, pp. 404–414.
- Plant, M.A., Plant, M.L., Miller, P., Gmel, G. and Kuntsche, S. (2009), “The social consequences of binge drinking: a comparison of young adults in six European countries”, *Journal of Addictive Diseases*, Vol. 28 No. 4, pp. 294–308.
- Preventative Health Taskforce, (2008), *Australia: the healthiest country by 2020 - Discussion Paper*, Canberra: Preventative Health Taskforce.
- Rabinovich, L., Brutscher, P.B., Vries, H.D., Vliet, J. and Reding, A. (2009), “The affordability of alcoholic beverages in the European Union: understanding the link between alcohol affordability, consumption and harms”, *European Commission*, Cambridge.



- Rehm, J., Mathers, C.J., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., and Patra, J. (2009), "Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders", *Lancet*, Vol. 373, pp. 2223-2233.
- Roxon, N. (2009), "Alcopops tax loophole finally closed", Office of the Minister for Health and Ageing, media release 13 August, available at: [www.health.gov.au](http://www.health.gov.au) (accessed 5 February 2010).
- Siemieniako, D., Rundle-Thiele, S. and Kubacki, K. (2010), "Exploring locality and college binge drinking: a Polish and Canadian perspective", *Young Consumers: Insight and Ideas for Responsible Marketers*, Vol. 11 No. 4, pp. 320–329.
- Shanahan, P., Wilkins, M. and Hurt, N. (2002), "A study of attitudes and behaviours of drinkers at risk research report", Commonwealth Department of Health and Ageing, Canberra.
- Shim, S. and Maggs, J. (2005), "A psychographic analysis of college students' alcohol consumption: implications for prevention and consumer education", *Family and Consumer Sciences Research Journal*, Vol. 33 No. 3, pp. 255–273.
- Skidmore, J.R. and Murphy, J.G. (2011), "The effect of drink price and next-day responsibilities on college student drinking: a behavioural economic analysis", *Psychology of Addictive Behaviours*, Vol. 25 No. 1, pp. 57–68.
- Spotswood, F., Tapp, A, French, J. and Stead, M. (2012), "Some reasonable but uncomfortable questions about social marketing", *Journal of Social Marketing*, Vol. 2 No 3, Emerald Earlycite (accessed 6 August 2012).
- Sun, I.Y. and Longazel, J.G. (2008), "College students' alcohol-related problems: a test of competing theories", *Journal of Criminal Justice*, Vol. 36, pp. 554–562.
- Tabachnick, B.G. and Fidell, L.S. (2007), *Using Multivariate Statistics*. 4th edn., Pearson, Needham Heights.

- Wechsler, H., Kuh, G. and Davenport, A. (2000), "Fraternities, sororities and binge drinking: results from a national study of American colleges", *NASPA Journal*, Vol. 33, pp. 260–279.
- Wechsler, H., Nelson, T.F., Lee, J.E., Seibring, M., Lewis, C., and Keeling, R.P. (2003), "Perception and reality: A national evaluation of social norms marketing interventions to reduce college students' heavy alcohol use", *Quarterly Journal of Studies of on Alcohol*, Vol. 64, pp. 484–494.
- Wettstein, D., Suggs, S.L. and Lellig, C. (2012), "Social marketing and alcohol misuse prevention in German speaking counties", Vol. 2 No. 3, *Emerald Earlycite* (accessed 6 August, 2012).
- White, H.R., Fleming, C.B., Kim, M.J., Catalano, R.F. and McMorris, B.J. (2008), "Identifying two potential mechanisms for changes in alcohol use among college-attending and non-college-attending emerging adults", *Developmental Psychology*, Vol. 44 No. 6, pp. 1625–1639.
- Wiebe, G.D. (1952), "Merchandising commodities and citizenship on television", *Public Opinion Quarterly*, Vol. 15, pp. 679–691.
- Wood, M.G., DeJong, W., Fairlie, A.M., Lawson, D., Lavigne, A.M. and Cohen, F. (2009), "Common ground: an investigation of environmental management alcohol prevention initiatives in a college community", *Journal of Studies on Alcohol and Drugs*, Vol. 16 July, pp. 96–105.
- World Health Organisation, (2011), *Global Status Report on Alcohol and Health*, WHO Press, Geneva, Switzerland.
- Yeh, M.Y., Chiang, I.C. and Huang, S.Y., (2006), "Gender differences in predictors of drinking behaviour in adolescents", *Addictive Behaviors*, Vol. 31, pp. 1929-1938.

Zamboanga, B.L. and Ham, L.S., (2008), “Alcohol expectancies and context-specific drinking behaviours among female college athletes”, *Behavior Therapy*, Vol. 39, pp. 162-170.

Zamboanga, B.L., Olthuis, J.V., Horton, N.J., McCollum, E.C., Lee, J.J. and Shaw, R. (2009), “Where’s the house party? Hazardous drinking behaviors and related risk factors”, *The Journal of Psychology*, Vol. 143 No. 3, pp. 228–244.

**Table 1: Summary of Results of Hypothesis Testing**

		Australia	Wales	Germany	
Multinomial Logistic	<b>H1.</b> <i>Price promotions</i> is a significant predictor in differentiating between low-risk, risky and high-risk alcohol consumers.	Unsupported $\chi^2 = 2.92, p > 0.05$	Supported $\chi^2 = 55.15, p < 0.05$	Unsupported $\chi^2 = 3.63, p > 0.05$	
	<b>H2.</b> <i>Venue</i> is a significant predictor in differentiating between low-risk, risky and high-risk alcohol consumers.	Unsupported $\chi^2 = 2.13, p > 0.05$	Supported $\chi^2 = 14.46, p < 0.05$	Unsupported $\chi^2 = 0.72, p > 0.05$	
	<b>H3.</b> <i>Place of residence</i> is a significant predictor in differentiating between low-risk, risky and high-risk alcohol consumers.	Supported $\chi^2 = 8.64, p < 0.05$	Unsupported $\chi^2 = 0.46, p > 0.05$	Unsupported $\chi^2 = 1.67, p > 0.05$	
Bivariate Logistic	Low-risk vs. Risky	Price promotions	Unsupported $z = 2.29, p > 0.05$	Supported $z = 26.76, p < 0.05$	Unsupported $z = 2.82, p > 0.05$
		Venue	Unsupported $z = 1.43, p > 0.05$	Supported $z = 9.54, p < 0.05$	Unsupported $z = 0.56, p > 0.05$
		Place of Residence	Supported $z = 6.22, p < 0.05$	Unsupported $z = 0.34, p > 0.05$	Unsupported $z = 0.30, p > 0.05$
	Low-risk vs. High-risk	Price promotions	Unsupported $z = 2.35, p > 0.05$	Supported $z = 27.10, p < 0.05$	Unsupported $z = 1.63, p > 0.05$
		Venue	Unsupported $z = 0.98, p > 0.05$	Supported $z = 10.40, p < 0.05$	Unsupported $z = 0.25, p > 0.05$
		Place of Residence	Supported $z = 5.66, p < 0.05$	Unsupported $z = 0.19, p > 0.05$	Unsupported $z = 1.58, p > 0.05$
	Risky vs. High-risk	Price promotions	Unsupported $z = 0.76, p > 0.05$	Supported $z = 9.54, p < 0.05$	Unsupported $z = 0.91, p > 0.05$
		Venue	Unsupported $z = 0.26, p > 0.05$	Unsupported $z = 0.34, p > 0.05$	Unsupported $z = 0.60, p > 0.05$
		Place of Residence	Unsupported $z = 0.04, p > 0.05$	Unsupported $z = 0.34, p > 0.05$	Unsupported $z = 0.54, p > 0.05$