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Peer pressure and alcohol use in young men: A mediation analysis of drinking motives

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Abstract

Background: Peer pressure (PP) has been shown to play a major role in the development and continuation of alcohol use and misuse. To date, almost all the studies investigating the association of PP with alcohol use only considered the PP for misconduct but largely ignored other aspects of PP, such as pressure for peer involvement and peer conformity. Moreover, it is not clear whether the association of PP with alcohol use is direct or mediated by other factors. The aim of the present study was to investigate the association of different aspects of peer pressure (PP) with drinking volume (DV) and risky single-occasion drinking (RSOD), and to explore whether these associations were mediated by drinking motives (DM).

Methods: A representative sample of 5,521 young Swiss men, aged around 20 years old, completed a questionnaire assessing their usual weekly DV, the frequency of RSOD, DM (i.e. enhancement, social, coping, and conformity motives), and 3 aspects of PP (i.e. misconduct, peer involvement, and peer conformity). Associations between PP and alcohol outcomes (DV and RSOD) as well as the mediation of DM were tested using structural equation models.

Results: Peer pressure to misconduct was associated with more alcohol use, whereas peer involvement and peer conformity were associated with less alcohol use. Associations of drinking outcomes with PP to misconduct and peer involvement were partially mediated by enhancement and coping motives, while the association with peer conformity was partially mediated by enhancement and conformity motives.

Conclusions: Results suggest that PP to misconduct constitutes a risk factor, while peer conformity and peer involvement reflect protective factors with regard to alcohol use. Moreover, results from the mediation analyses suggest that part of the association of PP with alcohol use

came indirectly through DM: PP was associated with DM, which in turn were associated with alcohol use.

Word count: 300

Keywords: alcohol use, risky single occasion drinking, peer pressure, drinking motives, mediation, young adults.

Introduction

Late adolescence and early adulthood have been described as periods of frequent alcohol abuse and risky behaviour (Barnes, Welte, & Dintcheff, 1992; Schulenberg & Maggs, 2002), leading to numerous negative consequences and problems (Gmel, Rehm, & Kuntsche, 2003; Hingson, Heeren, Zakocs, Kopstein, & Wechsler, 2002; Kuntsche, Knibbe, Gmel, & Engels, 2005). Peer pressure (PP), defined as the "pressure to think or to behave along certain peer-prescribed guidelines" (Clasen & Brown, 1985, p. 452), has been shown to play a major role in the development and continuation of alcohol use and other risky behaviour during adolescence and early adulthood (e.g. Aseltine, 1995; Bahr, Hoffmann, & Yang, 2005; Borsari & Carey, 2001; Brown, Clasen, & Eicher, 1986; Crockett, Raffaelli, & Shen, 2006; Dielman, Campanelli, Shope, & Butchart, 1987; Dumas, Ellis, & Wolfe, 2012; Jessor, Costa, Krueger, & Turbin, 2006; Kuntsche, Rehm, & Gmel, 2004; Stacy, Sussman, Dent, Burton, & et al., 1992). However, little is known about the more proximal factors underlying the association of peer pressure with drinking behaviour. The present study looks at the association between the more distal factor of 'peer pressure' and alcohol use in a sample of 20-year old Swiss men, and how this association is mediated by a more proximal factor, namely the motives for drinking alcohol.

Peer pressure is a key component in the socialization of adolescents and younger adults (Clasen & Brown, 1985). It shapes their sense of identity (Erikson, 1968) and the perceived norms of which behaviours are acceptable or not (Bandura, 1977). Peer pressure is not a unitary (one-dimensional) construct, but rather a multidimensional one. Clasen and Brown (1985, see also Brown et al., 1986) clustered peer pressure into 5 different domains: peer involvement (i.e. involvement in peer social activities, such as spending free time with friends, attending parties, and school social events), misconduct (i.e. use of substances, unsafe sex, and minor delinquent

behaviours), peer conformity (i.e. conformity to peer norms such as dressing or grooming styles, and musical tastes), involvement in school (e.g. being agreeable with teachers, working as diligently as possible), and involvement with family (e.g. obeying parents, showing respect for adults). These authors developed a questionnaire – the peer pressure inventory (PPI) – designed to evaluate different aspects of peer pressure.

To date, almost all the studies investigating the association of peer pressure with alcohol use only considered the aspect of misconduct as one sub-dimension of peer pressure. They showed that number of peers drinking alcohol, and peer pressure to use alcohol and other substances (which is the main part of the concept of 'misconduct'), were positively related to drinking outcomes (Bahr et al., 2005; Dielman et al., 1987; Flannery, Vazsonyi, Torquati, & Fridrich, 1994; Jamison & Myers, 2008; Keefe, 1994; Oostveen, Knibbe, & De Vries, 1996; Scull, Kupersmidt, Parker, Elmore, & Benson, 2010; Steinberg & Monahan, 2007; Svensson, 2010; Urberg, Değirmencioğlu, & Pilgrim, 1997). However, as noted by Allen and Antonishak (2008), not all peer influences are negative by definition: peers may also have positive influence, such as promoting prosocial and non-deviant behaviours. This positive side of peer pressure has been typically overlooked, in particular with regards to its association with alcohol. The first aim of the present study was to fill this gap by investigating not only the associations of misconduct with alcohol use, but also that of other aspects of peer pressure.

Literature on peer pressure also indicated that peer pressure may be direct and indirect. Direct peer pressure may exist in the form of explicit invitations to drink, such as offering somebody drinks, paying for rounds, dares or encouragement to drink (e.g. during drinking games), whereas indirect peer pressure may occur because of its contribution to the formation of alcohol-related cognitions (e.g. the personal norms, beliefs, expectations and motivations of the

individual) that are in turn expected to dictate drinking behaviours (Borsari & Carey, 2001; Maisto, Carey, & Bradizza, 1999; Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001). Few studies have examined whether the association of peer pressure and substance use was direct or indirect, i.e. independently contributed to alcohol use or was mediated through other more proximal factors.

Drinking motives (DM) – the value placed on the particular effects individuals want to achieve when drinking alcohol (Cox & Klinger, 2004) – are often considered the most proximal factors underlying drinking behaviour through which the influence of more distal factors are mediated (Cooper, 1994; Kuntsche, Knibbe, Engels, & Gmel, 2007; Tragesser, Sher, Trull, & Park, 2007). Drinking motives have been described according to 2 distinct dimensions of the outcomes which individuals hope to achieve by drinking: valence (i.e. drinking to enhance positive or reduce negative affect), and source (i.e. drinking to obtain an internal reward or to achieve external reward) (Cox & Klinger, 1988). Cooper (1994) developed a questionnaire – the Drinking Motive Questionnaire Revised (DMQ-R) – designed to yield 4 distinct drinking motives resulting from the combination of the dimensions of valence and source. Social motives (e.g. drinking because it makes social gatherings more fun) reflect drinking for positive, externally generated reinforcement; conformity motives (e.g. drinking to not feel left out) denote drinking for negative, externally generated reinforcement; enhancement motives (e.g. drinking to get high) indicate drinking for positive, internally generated reinforcement; coping motives (e.g. drinking to forget worries) indicate drinking for negative, internally generated reinforcement.

Several recent studies have provided evidence that associations of alcohol use with psychological factors such as alcohol expectancies (Kuntsche et al., 2007; Kuntsche, Wiers, Janssen, & Gmel, 2010), temperament, and personality (Kuntsche, von Fischer, & Gmel, 2008;

Stewart, Zvolensky, & Eifert, 2001; Tragesser et al., 2007; Willem, Bijttebier, Claes, & Uytterhaegen, 2012) were mediated by drinking motives. Other studies have provided evidence that associations of alcohol use with more social factors, such as social norms (Halim, Hasking, & Allen, 2012) and parental drinking habits (Müller & Kuntsche, 2011), were also mediated by drinking motives. These findings suggest that drinking motives may also account for indirect (i.e. mediated) associations of alcohol use with peer pressure. The second aim of this study was to investigate whether the association of peer pressure with alcohol use was mediated by drinking motives. Evidence of mediation would suggest that peer pressure influences the formation of drinking motives which in turn are associated with alcohol use. Direct effects would mean that peer pressure itself is an additional risk factor for alcohol use, over and above its association with the drinking motives of an individual.

Based on a representative sample of young Swiss adult males, the present study aimed to investigate the associations of usual weekly drinking volume (DV) and risky single-occasion drinking (RSOD) with three peer pressure aspects (i.e. misconduct, peer involvement, peer conformity). The other peer pressure domains related to family involvement and school involvement were not assessed because most young adults in Switzerland no longer attend school nor live with their parents (Baggio, Studer, Daeppen, & Gmel, 2013). We hypothesized that peer pressure to misconduct was positively related to alcohol use because misconduct reflects the negative side of peer pressure. In contrast, we hypothesized that peer pressure for peer involvement and peer conformity reflected the positive side of peer pressure and negative associations with alcohol use were expected, over and above that of misconduct. With regard to mediation, we expected associations of peer pressure with alcohol use to be mainly mediated by enhancement and coping motives, because enhancement and coping motives are generally more

strongly related to alcohol use outcomes than social and conformity motives (Kuntsche et al., 2005).

Methods

Enrolment Procedure

The present study's data are part of the baseline phase of a larger project – the Cohort Study on Substance Use Risk Factor (C-SURF) – designed to assess substance use patterns and their related consequences in a cohort of young Swiss men. The protocol (Protocol No. 15/07) was approved by Lausanne University Medical School's Clinical Research Ethics Committee.

In Switzerland, army recruitment is compulsory and virtually all young men of around 19 years old are called up to one of 6 national recruitment centres to determine their eligibility for military or civil service. Study enrolment took place between August 23, 2010, and November 15, 2011, in 3 army recruitment centres located in Lausanne (French-speaking), Windisch, and Mels (German-speaking). These 3 centres cover 21 of Switzerland's 26 cantons, including all French-speaking cantons. As there is no pre-selection for army conscription, a virtually complete census of the Swiss male population in this age group was eligible for inclusion in the study.

Participants

Of the 7,563 men who gave written consent to their participation (50.2% of the eligible population), 5,990 (79.2%) completed the baseline questionnaire between September 30, 2010 and March 5, 2012; this had been sent out to them privately, two weeks after recruitment centre visits. Questionnaires were self-completed, without any face to face contact. Sampling procedures and potential non-response bias have been described elsewhere (Studer, Baggio, et al., 2013; Studer, Mohler-Kuo, et al., 2013). Briefly, non-respondents drank more alcohol than respondents, but the magnitude of the differences was small, indicating a small non-response

bias. Abstainers were excluded (n = 469, 7.83%) because the DM questionnaire was only assessed among 12-month drinkers. The final sample consisted of 5,521 participants.

Measures

Alcohol use. Usual quantities and frequencies of alcohol consumption during the 12 months prior to the questionnaire were assessed separately for workdays (i.e. Monday to Thursday) and weekend days (i.e. Friday, Saturday, Sunday). Frequency was measured by asking about the average number of days on which alcohol was consumed. Choices for weekend frequency were 3 days per weekend (coded 156), 2 days per weekend (coded 104), 1 day per weekend (coded 52), 2–3 weekend days per month (coded 30), 1 weekend day per month (coded 12), less than 1 weekend day per month (coded 6), and never (coded 0). Choices for workday frequency were 4 days per week (coded 208), 3 days per week (coded 156), 2 days per week (coded 104), 1 day per week (coded 52), 2–3 workdays per month (coded 30), 1 workday per month (coded 12), less than 1 workday per month (coded 6), and never (coded 0). Weekend and workday drinking quantities were assessed separately by asking about the usual number of standard drinks consumed during those periods. Response choices were 12 drinks or more (coded 13), 9–11 drinks (coded 10), 7–8 drinks (coded 7.5), 5–6 drinks (coded 5.5), 3–4 drinks (coded 3.5) and 1–2 drinks (coded 1.5). Pictures of standard drinks containing approximately 10–12 grams of pure alcohol were provided. Weekly weekend and workday DV were obtained by multiplying drinking frequency by quantity and dividing by 52. Weekly DV was obtained by summing weekend and workday drinking volumes. As the distribution of DV was right skewed, a log transformation was applied. The frequency of RSOD – i.e. occasions when at least six standard drinks were consumed – was also assessed. Monthly or more frequent RSOD was coded 1 and less than monthly RSOD was coded 0.

Peer pressure. PP was assessed using a short version of Clasen and Brown's original PPI (Brown et al., 1986; Clasen & Brown, 1985): a questionnaire recently validated in French (F-PPI) and German (G-PPI) (Baggio et al., 2013). Both the F-PPI and G-PPI asked participants to evaluate how strongly they perceived pressure from their friends in 17 pairs of statements representing polar opposite pressures. These statements refer to 3 of the 5 original PPI domains: misconduct (M, e.g. not to get drunk vs. to get drunk or get "a buzz"), peer involvement (PI, e.g. to stay at home at the weekends vs. to go out with friends), and peer conformity (PC, e.g. to talk or act differently from vs. in the same way as your friends do). Each statement was evaluated on a seven-point Likert scale ranging from -3 "a lot of pressure not to do" to 3 "a lot of pressure to do" with 0 for "no pressure". Following Baggio et al. (2013), -3 to 0 responses were grouped together to produce item responses ranging from 0 "pressure not to do or no pressure" to 3 "a lot of pressure to do". PP domains showed questionable to acceptable internal consistency (α_M = .65; α_{PI} = .72; α_{PC} = .49). In the analyses, the three PP domains were treated as latent variables for ordinal data and separate mean scores were computed for each domain for descriptive purposes.

Drinking motives. DM were assessed using the Drinking Motives Questionnaire Revised Short Form (DMQ-R SF; Kuntsche & Kuntsche, 2009). The DMQ-R SF consists of 12 statements, 3 for each of the 4 DM: social, enhancement, coping, and conformity. Using a five-point Likert scale, ranging from never (coded 1) to always (coded 5), participants were asked to consider all the times they had drunk alcohol in the last 12 months and to indicate the frequency at which they had drunk for each specific reason. Each DM showed good internal consistency (α_{Social} = .84; $\alpha_{Enhancement}$ = .82; α_{Coping} = .84; $\alpha_{Conformity}$ = .84). The four DM were treated as latent variables for ordinal data in the analyses, and mean scores for each DM were computed separately for descriptive purposes.

Socio-demographic variables. Socio-demographic variables included age and linguistic region (German- or French-speaking).

Statistical Analyses

Descriptive statistics were calculated to characterize the sample in terms of age, linguistic region, DV, RSOD, DM, and PP. Zero-order correlations between all variables (i.e. bivariate correlations), simultaneous associations of the three PP domains and alcohol outcomes, and mediation of DM, were all tested using Mplus 7 (Muthén & Muthén, 1998-2012). Structural equation models (SEM) were calculated separately for DV and RSOD. Age and linguistic region were included as covariates in both models. Compared with Baron and Kenny's (1986) classic four-step procedure to test mediation, SEM have the advantage of being a single-step testing model for mediation (MacKinnon, Fairchild, & Fritz, 2007). To do this, SEM (see Figure 1 for a graphical representation of the structural model) estimate the paths (c') between predictors (i.e. PP domains) and outcomes, the paths (a) between the predictors and mediators (i.e. DM), and the paths (b) between mediators and outcomes. The specific indirect association of a given PP domain on the outcome, via a given DM, is defined as the product of the path linking that PP domain to the DM (a) and the path linking that DM to the outcome (b). For example, the specific indirect associations of misconduct on drinking outcome, via enhancement, is quantified as $a_1 * b_1$ (see Figure 1). The total indirect associations of a given PP domain on drinking outcomes is the sum of all the specific indirect associations of that PP domain. For example, in Figure 1, the total indirect associations of PP to misconduct is defined as $\sum_{i=1}^{4}(a_i * b_i)$. The total association (c) of a given PP domain on the outcome, is the sum of the direct association c' and the total indirect association. For example, for PP to misconduct, the total association is defined as: $c = c' + \sum_{i=1}^{4}(a_i * b_i)$. If both the indirect and direct association are significant, then there is

evidence for partial mediation. In contrast, if the indirect association is significant and the direct association is zero, or close to zero, then there is evidence of full mediation.

Seven latent variables for ordinal data were created for the 3 PP domains and the 4 DM. Definitions and examples of these constructs are summarized in Table 1. Parameter estimates were based on the weighted least squares mean-variance (WLSMV) adjusted estimator with missing data estimation. The delta method was used to calculate standard errors and the statistical significance of indirect associations (Muthén & Muthén, 1998-2012). The statistical analysis handled missing values (2.00% of all data, 7.15% of participants with at least one missing value) by using the full information maximum likelihood (FIML) method. The model fit was examined using the comparative fit index (CFI), the Tucker-Lewis index (TLI) and the root mean square error of approximation (RMSEA). CFI and TLI higher than .95, and RMSEA lower than .06, are indicative of good fit (Hu & Bentler, 1999). Standardized coefficients are presented because they permit direct comparisons of the different path coefficients.

Insert Table 1 and Figure 1 about here.

Results

Sample characteristics are presented in Table 2. On average, participants were 20 years old. A little less than half were German-speaking. Participants drank an average of 9 drinks per week, and about half of them reported having RSOD at least once a month. These young men more often endorsed social and enhancement motives than coping and conformity motives. The highest PP was peer involvement, followed by pressure to misconduct, and then peer conformity.

Insert Table 2 about here.

Zero-order correlations between PP domains, DM, DV, and RSOD are presented in Table 3. All associations were positive and significant. Nevertheless, drinking outcomes had higher

correlations with DM than with PP. Results of SEM of DM as mediators of the association between PP and alcohol use outcomes are presented in Tables 4 and 5. All fit indices suggested that both the SEM predicting DV (CFI = .968; TLI = .961; RMSEA = .043) and RSOD (CFI = .968; TLI = .961; RMSEA = .043) fit well the data.

Insert Table 3 about here

When all aspects of PP were introduced into the SEM simultaneously, the associations of PP to misconduct and both alcohol use outcomes remained positive and significant ($\beta = 0.576$, SE = 0.033, $p < 0.001$, for DV; $\beta = 0.637$, SE = 0.040, $p < 0.001$, for RSOD, see total association, Table 4). The total association can be decomposed into a direct association ($\beta = 0.218$, SE = 0.036, $p < 0.001$, for drinking volume; $\beta = 0.286$, SE = 0.045, $p < 0.001$, for RSOD) and a total indirect, or mediated association, of DM ($\beta = 0.358$, SE = 0.023, $p < 0.001$, for DV; $\beta = 0.351$, SE = 0.024, $p < 0.001$, for RSOD). The total mediated association is the sum of the specific indirect associations in Table 5, i.e. for misconduct, it consists mainly of the specific indirect associations of enhancement ($\beta = 0.327$, SE = 0.029, $p < 0.001$, for DV; $\beta = 0.370$, SE = 0.038, $p < 0.001$, for RSOD) and coping ($\beta = 0.106$, SE = 0.013, $p < 0.001$, for DV; $\beta = 0.051$, SE = 0.014, $p < 0.001$, for RSOD). Thus, the positive total association of PP to misconduct was partially mediated by the significant specific indirect associations of enhancement and coping motives: misconduct was positively associated with enhancement and coping DM, which in turn were positively related to drinking volume and RSOD (see Table 5). Mediation analysis also indicated a significant negative indirect association of PP to misconduct with the alcohol use outcomes via conformity DM ($\beta = -0.052$, SE = 0.013, $p < 0.001$, for DV; $\beta = -0.052$, SE = 0.016, $p = 0.001$, for RSOD). PP to misconduct was positively related to conformity motives, which in turn was negatively related to both drinking volume and RSOD.

Whereas associations of both alcohol outcomes with PP to conform were found to be positive and significant in zero-order correlations, when all the PP domains were introduced simultaneously into the SEM, these associations were found negative and significant ($\beta = -0.184$, $SE = 0.034$, $p < 0.001$ for volume; $\beta = -0.180$, $SE = 0.044$, $p < 0.001$, for RSOD , see total association, Table 4). The negative total association of PP to conform was mediated predominantly by the enhancement ($\beta = -0.061$, $SE = 0.019$, $p = 0.002$ for DV; $\beta = -0.069$, $SE = 0.022$, $p = 0.002$, for RSOD) and conformity motives ($\beta = -0.041$, $SE = 0.010$, $p < 0.001$ for DV; $\beta = -0.042$, $SE = 0.013$, $p = 0.001$, for RSOD, see specific indirect associations, Table 5). PP to conform was negatively associated with enhancement and positively related to the conformity DM. In turn, associations of the enhancement and conformity DM with DV and RSOD were positive and negative, respectively. A significant positive indirect association of PP to conform on DV and RSOD was also found via the coping DM ($\beta = 0.032$, $SE = 0.011$, $p = 0.004$ for DV; $\beta = 0.015$, $SE = 0.007$, $p = 0.021$, for RSOD).

As with PP to conform, when introduced simultaneously with other PP domains, the associations of PP for peer involvement with alcohol use outcomes were negative ($\beta = -0.157$, $SE = 0.037$, $p < 0.001$ for volume; $\beta = -0.180$, $SE = 0.044$, $p < 0.001$, for RSOD, see total association, Table 4). The negative association of peer involvement was partially mediated, predominantly through the enhancement ($\beta = -0.094$, $SE = 0.020$, $p < 0.001$ for volume; $\beta = -0.107$, $SE = 0.023$, $p < 0.001$, for RSOD) and coping DM ($\beta = -0.086$, $SE = 0.013$, $p < 0.001$ for volume; $\beta = -0.042$, $SE = 0.012$, $p = 0.001$, for RSOD, see specific indirect associations, Table 5). Peer involvement was negatively related to enhancement and coping, which were in turn positively associated with both DV and RSOD. A significant positive indirect association of peer involvement with drinking outcomes was also found through the conformity DM ($\beta = 0.054$, SE

= 0.013, p < 0.001 for DV; β = 0.054, SE = 0.017, p = 0.001, for RSOD): peer involvement was negatively related to the conformity DM, which in turn were negatively related to both drinking volume and RSOD.

Insert Tables 4 and 5 about here

Discussion

The present study's goal was to investigate the associations of drinking volume and risky single occasion drinking with different aspects of peer pressure in a representative sample of Swiss young male adults, and to test whether these associations were mediated by drinking motives.

Associations of alcohol use outcomes with peer pressure

With regard to relations with alcohol use outcomes, both zero-order correlations and SEM yielded similar results for peer pressure to misconduct. As often shown in the literature (Bahr et al., 2005; Dielman et al., 1987; Flannery et al., 1994; Jamison & Myers, 2008; Keefe, 1994; Oostveen et al., 1996; Scull et al., 2010; Steinberg & Monahan, 2007; Svensson, 2010; Urberg et al., 1997), peer pressure to misconduct was associated with increased alcohol use. Accordingly, peer pressure to misconduct constitutes a risk factor for alcohol use as defined by the U.S. National Institute on Drug Abuse (Robertson, David, & Rao, 2003).

With regard to associations of peer pressure domains, other than misconduct, and alcohol use outcomes, discrepancies were found between zero-order correlations and SEM coefficients. Zero-order correlations showed positive and significant associations between peer involvement and peer conformity, and both drinking volume and risky single occasion drinking, whereas SEM yielded significant and negative associations for these two peer pressure domains. This lack of consistency probably arises from the substantive overlap between the different peer pressure

domains and suggests the presence of negative suppression (Lancaster, 1999; Maassen & Bakker, 2001; Pandey & Elliott, 2010; Tzelgov & Henik, 1991). Thus, correlations did not properly reflect the association of pressure for peer involvement and for peer conformity *per se*, but rather reflected the effect of the variance that those variables share with peer pressure to misconduct. Those reporting pressure to misconduct may also have frequent deviant peers who put pressure on them to conform with and get involved in deviant behaviour, such as drinking alcohol excessively. However, when this link with misconduct is taken into account, as is the case in SEM, the remaining variance of peer involvement and peer conformity may reflect pressure from non-deviant and positive peers, such as e.g. involvement in caring for friends and conformity with non-deviant and positive behaviours. Accordingly, this finding suggests, that over and above the association of misconduct, pressure for peer conformity and peer involvement operate as protective factors and have a beneficial effect on young adults' alcohol use. This is in line with the proposition of Allen and Antonishak (2008), suggesting that the influence of peers may have a positive side.

Mediation of drinking motives

As previously shown for distal factors such as personality, social norms, and parental drinking habits (Halim et al., 2012; Kuntsche et al., 2008; Müller & Kuntsche, 2011; Stewart et al., 2001; Tragesser et al., 2007; Willem et al., 2012), evidence of mediation by drinking motives was found for the links between each peer pressure domain and alcohol use. This finding provides support for the indirect influence of peers on young adults' alcohol use (Borsari & Carey, 2001; Maisto et al., 1999; Simons-Morton et al., 2001). It complements previous studies showing mediation of the influence of peers (e.g. friends' attitudes to alcohol, friends' alcohol use, pressure to drink) on alcohol use via cognitive factors, namely positive alcohol expectancies

(Scheier & Botvin, 1997; Wood, Read, Palfai, & Stevenson, 2001). As the link between alcohol expectancies and alcohol use is mediated by drinking motives (Kuntsche et al., 2010), this finding therefore provides further support to the assumption that drinking motives constitute the final path toward alcohol use, through which the influence of more distal factors is mediated (Cooper, 1994; Cox & Klinger, 2004; Kuntsche et al., 2007; Tragesser et al., 2007).

Generally, results were very similar for drinking volume and risky single occasion drinking, probably related to the fact that most of the alcohol volume consumed by young men was during risky single occasion drinking: these results can thus be discussed together. The positive association between misconduct and drinking outcomes, and the negative association between peer involvement and drinking outcomes were partially mediated, mostly by enhancement, but additionally by coping motives. These two motives have an internal source (Cooper, 1994) and are related to the regulation of individuals' affective states (Cooper, Frone, Russell, & Mudar, 1995). They are generally associated with heavier alcohol use and more alcohol related problems than are external motives (Kuntsche et al., 2005). A possible explanation is that individuals reporting high peer pressure to misconduct may have learned the desirable effects of alcohol from their deviant peers and have developed maladaptive strategies to regulate their affective state; these could be using alcohol to dampen unpleasant emotions (coping motives) or to optimize pleasant emotions (enhancement motives). In contrast, we speculate that those reporting high pressure for peer involvement may have more positive friends who take care of individuals' behaviours and disapprove of deviant behaviours such as using too much alcohol. By spending time with positive friends, individuals may have learned to avoid using alcohol to regulate affective states and thus to endorse fewer enhancement and coping drinking motives. As a consequence, they may in contrast develop more adaptive emotion

regulation strategies than using alcohol; these could be finding support from friends to cope with negative feelings or doing sports or other leisure activities to boost positive emotions.

With regard to the negative association between peer conformity and drinking outcomes, evidence showed that the main mediators were enhancement motives, followed by some conformity motives. High pressure for peer conformity was associated with low enhancement motives and high conformity motives, which in turn were associated with high and low alcohol use, respectively. Thus, because they drink less for enhancement and more for conformity motives, some individuals reporting high peer pressure to conform may drink less than those reporting low pressure. Unlike those endorsing other drinking motives, conformity drinkers do not seek the physiological effects of alcohol, but drink in order to avoid social rejection due to non-participation in 'normative' behaviours (Cooper, 1994; Patrick, Lee, & Larimer, 2011). They are prone to drink primarily on special occasions and to consume less alcohol than those drinking for other motives (Kuntsche, Knibbe, Gmel, & Engels, 2006; Kuntsche & Kuntsche, 2009). Thus, those reporting high peer pressure to conform may consume less alcohol because they drink just enough so as to not stand out or be seen as abstainers by their peers.

It should be noted that results principally showed evidence for partial mediation (except for peer involvement with drinking volume). Therefore, drinking motives only mediate a part of the association between peer pressure and alcohol use; the remaining part of this association may reflect a direct link between peer pressure and alcohol use, supplementary to that accounted for by drinking motives. This finding is in line with the proposition of the existence of a direct influence of peers on alcohol use as a result of explicit peer encouragement to drink (Borsari & Carey, 2001; Maisto et al., 1999; Scheier & Botvin, 1997; Simons-Morton et al., 2001). However, the lack of evidence of full mediation may not necessarily indicate the presence of a link that is

direct per se. This may also be the sign of the existence of other mediators of the link between peer pressure and alcohol use, which were not considered in the present study. These omitted mediators may be drinking motives other than the four assessed. For example, Doyle, Donovan and Simpson (2011) proposed that drinking motives are more distinctly delineated into 9 reasons, rather than 4. Accordingly, we cannot exclude that this more refined classification of drinking motives may better account for the peer pressure–alcohol use associations. Further studies are needed to investigate the possible mediation of drinking motives other than those considered in this study.

Nevertheless, particularly for peer pressure to misconduct, the size of indirect associations was often stronger than, or close to, that of the direct associations, thus contributing to a large part of the link between peer pressure and alcohol use. Current prevention programs addressing the link between peers and alcohol use focus essentially on training resistance to peer pressure or on providing normative feedback (Botvin, 2000; Donaldson, Graham, Piccinin, & Hansen, 1995; Hansen & Graham, 1991; Walters, Vader, & Harris, 2007). As several promising intervention approaches incorporate changing drinking motives in order to prevent heavy drinking (Conrod, Stewart, Comeau, & Maclean, 2006; Stewart et al., 2005), our results suggest that these approaches may also be effective to prevent the negative influence of peer pressure on alcohol use. More specifically, prevention programs targeting changes in the drinking motives of enhancement and coping may provide alternative or complementary ways to improve the efficacy of those current prevention programs.

Limitations

This study does have a few limitations. The cross-sectional design precludes drawing any causal conclusions; results should therefore be confirmed in future longitudinal studies. The

Cronbach's alpha coefficient of the peer conformity domain is suboptimal, but is nevertheless higher than in previous studies (see Baggio et al., 2013, for a discussion). Also, the sample is limited to young adult males, preventing a generalization of the results to females or people in other age ranges. An additional limitation may be the use of a 12-month reference period for questions on alcohol use instead of shorter period: longer reference periods are associated with higher recall bias (forgetting). However, using reference periods shorter than 12 months may also induce bias other than recall bias, such as the underestimation of the number of rare drinkers and infrequent heavy drinkers, but equally the overestimation of abstainers (Dawson & Room, 2000; Gmel & Rehm, 2004). Thus, when the objective is to examine the association between alcohol use and individual variables (e.g. psychological factors, number of alcohol related consequences), using shorter reference periods may lead to more pronounced bias than using longer reference periods (Gmel & Rehm, 2004; Gmel et al., in press).

Conclusion

The present study examined the association of different aspects of peer pressure with alcohol use in young adult males, and tested the mediation of drinking motives. As often shown in the literature, results indicated that peer pressure to misconduct constitutes a risk factor for increased alcohol use. In contrast, although the association of other aspects of peer pressure with alcohol use have been rarely studied, results suggest that over and above peer pressure to misconduct, pressure for peer involvement and peer conformity may shield young adult males from alcohol abuse, thus constituting protective factors.

The results of mediation analysis suggest that a large part of the link between peer pressure and misconduct and alcohol use is indirect, and occurs by through the enhancement and (to a lesser extent) the coping drinking motives. In other words, peer pressure to misconduct is

internalized in cognitive representations (i.e. enhancement and coping motives) that are associated with the heavy alcohol use (Kuntsche et al., 2005). Thus, prevention programs targeting a change in the drinking motives of enhancement and coping may be a more efficient strategy to reduce the negative influence of peer pressure to misconduct than targeting peer pressure directly; this is because peer pressure may be more difficult to change than drinking motives.

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Figure captions

Figure 1

Heading: Schematic representation of the structural model of peer pressure domains associated with drinking outcome directly, and indirectly via drinking motives

Legend: Age and linguistic region covariates and covariances between peer pressure domains and between drinking motives were omitted from the figure for ease of presentation

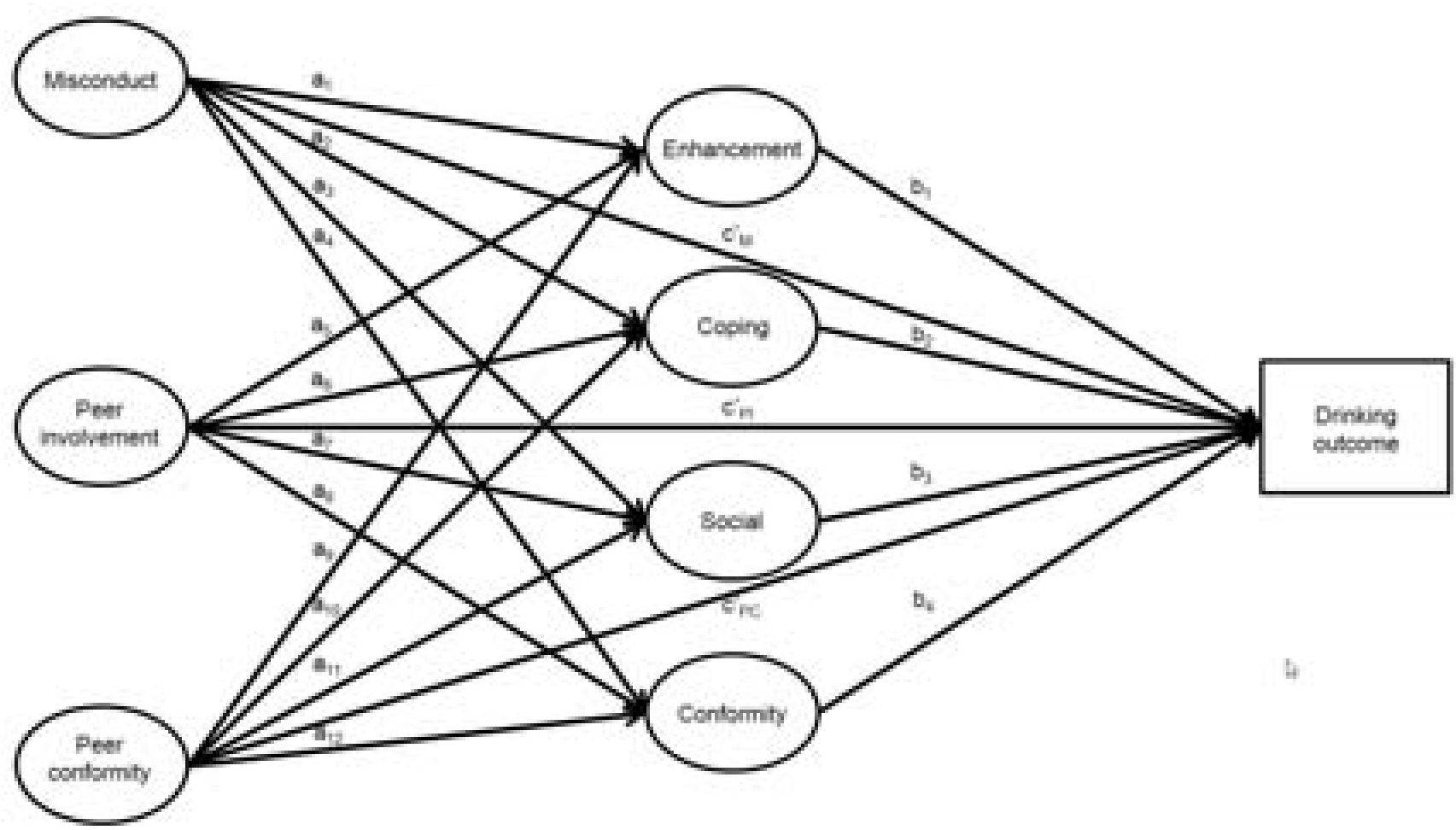
Misconduct
Peer involvement
Peer conformity
Enhancement
Coping
Social
Conformity
Drinking outcome

Table 1. Summary of key variables

Concept	Definition	Example
Peer pressure (PP)	Multidimensional construct defined as the pressure to think or to behave along certain peer-prescribed guidelines.	Peer pressure to misconduct, pressure for peer conformity, pressure for peer involvement
Pressure to misconduct (M)	Pressure to involve in deviant behaviors	Pressure to get drunk, to "trash" or vandalize things
Pressure for peer conformity (PC)	Pressure to conform to peer norms	Pressure to have the same opinion as their friends, to wear the same styles of clothes as their friends
Pressure for peer involvement (PI)	Pressure to involve in peer social activities	Pressure to spend free time with friends, to be sociable
Drinking motives (DM)	Value placed on the effects individuals want to achieve when drinking alcohol. May be conceptualized as a function of two dimensions of the outcome individuals hope to achieve by drinking, namely valence (drinking to enhance positive or reduce negative affect) and source (drinking to obtain internal or to achieve external reward)	Enhancement, coping, social, and conformity motives
Enhancement (E)	Drinking for positive, internally generated reinforcement	Drinking to get high
Coping (Cop)	Drinking for negative, internally generated reinforcement	Drinking to forget worries
Social (S)	Drinking for positive, externally generated reinforcement	Drinking because it makes social gatherings more fun
Conformity (Con)	Drinking for negative, externally generated reinforcement	Drinking to not feel left out

Table 2. Descriptive characteristics of the sample

	Mean or %	SD
Age	19.98	1.23
Linguistic region		
French-speaking	54.80%	
German-speaking	45.20%	
Alcohol use outcomes		
Weekly drinking volume	9.08	10.48
Monthly or more RSOD	49.90%	
Drinking motives		
Enhancement	2.50	1.09
Coping	1.60	0.78
Social	2.75	1.07
Conformity	1.25	0.56
Peer pressure		
Peer conformity	0.20	0.29
Peer involvement	0.94	0.77
Misconduct	0.36	0.43

Note. SD, standard deviation, RSOD, risky single-occasion drinking.

Table 3. Zero-order correlation between alcohol use outcomes, drinking motives and peer pressure

	1	2	3	4	5	6	7	8
1. RSOD								
2. Drinking volume	.813							
3. DM social	.553	.531						
4. DM coping	.375	.445	.519					
5. DM enhancement	.633	.609	.872	.554				
6. DM conformity	.174	.201	.395	.600	.346			
7. PP peer conformity	.104	.074	.212	.161	.174	.300		
8. PP peer involvement	.174	.145	.261	.051	.225	.105	.683	
9. PP misconduct	.394	.345	.488	.252	.463	.305	.635	.739

Note. All $r \geq .051$ are significant at $p < .01$. All $r \geq .074$ are significant at $p < .001$. RSOD, risky single-occasion drinking. DM, drinking motives. PP, peer pressure.

Table 4. Total, direct and total indirect associations of peer pressure domains on alcohol outcomes.

	Total association			Direct association			Total indirect association		
	β	SE	*p*	β	SE	*p*	β	SE	*p*
Drinking volume									
PP Misconduct	0.576	0.033	<.001	0.218	0.036	<.001	0.358	0.023	<.001
PP Peer conformity	-0.184	0.034	<.001	-0.117	0.033	<.001	-0.067	0.024	.005
PP Peer involvement	-0.157	0.037	<.001	-0.037	0.035	.294	-0.120	0.025	<.001
RSOD									
PP Misconduct	0.637	0.040	<.001	0.286	0.045	<.001	0.351	0.024	<.001
PP Peer conformity	-0.180	0.044	<.001	-0.087	0.044	.049	-0.093	0.024	<.001
PP Peer involvement	-0.180	0.045	<.001	-0.090	0.046	.049	-0.090	0.025	<.001

Note. β, standardized slopes. SE, standard error of β. *p*, p-value. RSOD, risky single-occasion drinking. DM, drinking motives. PP, peer pressure.

Table 5. Peer pressure domains and drinking motives as simultaneous predictors of drinking volume and RSOD.

	DM enhancement			DM coping			DM social			DM conformity		
	β	SE	*p*	β	SE	*p*	β	SE	*p*	β	SE	*p*
Drinking volume (DV)												
DM to DV (b)	0.474	0.037	<.001	0.245	0.023	<.001	-0.034	0.037	.355	-0.127	0.027	<.001
PP Misconduct												
Misconduct to DM (a)	0.690	0.035	<.001	0.432	0.037	<.001	0.678	0.032	<.001	0.408	0.041	<.001
Specific indirect (a*b)	0.327	0.029	<.001	0.106	0.013	<.001	-0.023	0.025	.358	-0.052	0.013	<.001
PP Peer conformity												
Peer conformity to DM (a)	-0.128	0.040	.001	0.129	0.042	<.002	-0.098	0.038	.009	0.327	0.047	<.001
Specific indirect (a*b)	-0.061	0.019	.002	0.032	0.011	.004	0.003	0.004	.398	-0.041	0.010	<.001
PP Peer involvement												
Peer involvement to DM (a)	-0.199	0.039	<.001	-0.352	0.043	<.001	-0.178	0.037	<.001	-0.424	0.051	<.001
Specific indirect (a*b)	-0.094	0.020	<.001	-0.086	0.013	<.001	0.006	0.007	.363	0.054	0.013	<.001

Table 5 (continued)

	DM enhancement			DM coping			DM social			DM conformity		
	β	SE	*p*	β	SE	*p*	β	SE	*p*	β	SE	*p*
RSOD												
DM to RSOD (b)	0.537	0.051	<.001	0.119	0.032	<.001	-0.027	0.050	.585	-0.127	0.036	<.001
PP Misconduct												
Misconduct to DM (a)	0.690	0.035	<.001	0.432	0.037	<.001	0.678	0.032	<.001	0.408	0.041	<.001
Specific indirect (a*b)	0.370	0.038	<.001	0.051	0.014	<.001	-0.018	0.034	.586	-0.052	0.016	.001
PP Peer conformity												
Peer conformity to DM (a)	-0.128	0.040	.001	0.129	0.042	.002	-0.098	0.009	.014	0.328	0.047	<.001
Specific indirect (a*b)	-0.069	0.022	.002	0.015	0.007	.021	0.003	0.005	.596	-0.042	0.013	.001
PP Peer involvement												
Peer involvement to DM (a)	-0.199	0.039	<.001	-0.352	0.043	<.001	-0.177	0.037	<.001	-0.424	0.051	<.001
Specific indirect (a*b)	-0.107	0.023	<.001	-0.042	0.012	.001	0.005	0.009	.541	0.054	0.017	.001

Note. DM, drinking motives. PP, peer pressure. DV, drinking volume. RSOD, risky single-occasion drinking. β, standardized slopes. SE, standard error of β. *p*, p-value.