INTRODUCTION

Over the second half of the 1990s, alcopops and designer drinks (ready-made, pre-mixed spirit-based beverages) enjoyed increasing popularity in Scotland, Wales, and England (Hughes et al., 1997; McKeganey, 1998; Roberts et al., 1999; Brain et al., 2000). These ‘new drinks’ rapidly spread to Scandinavian and continental European, as well as Mediterranean countries, where wine is traditionally preferred. Adolescents and young adults represent the primary target groups for alcopops. This is, for example, reflected in the prevalence rates published in the most recent European School Survey Project on Alcohol and other Drugs (ESPAD). The proportion of 15–16-year-old pupils who had consumed alcopops at the last possible opportunity fluctuated from 6% (Poland) to 62% (Cyprus and Isle of Man) across those countries involved in the 2003 ESPAD survey (Hibell et al., 2004).

Following the successful launch of alcopops, the new alcoholic beverages received considerable attention. It was argued that (i) the taste and the flavour, (ii) the trendy design, (iii) the specific advertisement and marketing strategies, and (iv) the image of the drinks specifically appeal to youngsters, who consequently begin consuming alcohol at a younger age. The sweet flavour was particularly considered to entice girls to embark on the use of alcohol, who otherwise would not drink. Through both sweetness and flavouring the alcoholic content of alcopops is masked to such an extent that teenagers find the product itself (Covell, 1992; McKibben, 1996; Kelly and Adamson, 1998) and artificially coloured (Glenewinkel et al., 1998; Forsyth, 2001). The packaging is often marked and artificially coloured (Glenewinkel et al., 1998; Robledo de Dios, 1998; Forsyth, 2001). The packaging is often marked with a particular imprint (McKibben, 1996; MacCall, 1998) and the drinks carry fashionable, rebellious or antisocial names (Hughes et al., 1997; Glenewinkel et al., 1998).

Further reasons for the success of alcopop beverages are to be found in the young-adult-tailored advertisement and marketing strategies (Glenewinkel et al., 1998; Robledo de Dios, 1998; Haustein, 2003; Setertobulte and Hurrelmann, 2003). In addition to classical broadcasting, new forms of image and lifestyle advertising, centring on a particular way of life which is designed to be associated by potential consumers with the product, makes a better impression on the adolescent target group than traditional product-oriented advertising, which presents the characteristics or qualities of the product itself (Covell, 1992; McKibben, 1996; Kelly and Edwards, 1998; Waiters et al., 2001; Haustein, 2003). The relationship established within advertising between alcohol consumption, fun, and social acceptance is viewed as being especially influential (Wyllie et al., 1998).

Finally, alcopops are connected with an image of youthfulness (Leeming et al., 2002) and their relatively high price, also carry the prestige of being exclusive (Brain et al., 2000). They appear to enjoy an even better image among girls and are perceived as being soft and specifically developed for girls (Brain et al., 2000). Alcopops possess tangible emotional attributes, which are especially attractive to young people and appear to legitimise adolescent alcohol consumption (Hughes et al., 1997; Sutherland and Willner, 2006).
Adolescents seem to consider alcopops to be particularly innocuous and less associated with unpleasant physiological changes (Leeming et al., 2002).

The current paper will thus review the evidence provided by studies investigating the relationship between alcopop consumption, drinking patterns and negative consequences, in particular, considering specific effects beyond the effect of ethanol intake. An alcopop-specific effect only exists if those problems attributed to alcopops, such as earlier onset of consumption and increased consumption, are either absent or reduced when alcopops are no longer or not so easily available.

The urgent necessity of general endeavours to reduce alcohol consumption among young people is indisputable. That this goal can be attained solely by limiting alcopops is, however, controversially discussed. Crossland and Potier de la Morandiere (2001) for example, view the causes of expanding alcohol use among adolescents less as resting in the form of the additional alcopop drink and more in modified social attitudes towards alcohol. Crawford and Allsop (1996) also ascribe the growing problem of teenage alcohol consumption to the almost unrestricted availability of alcoholic beverages rather than to continually changing drink preferences. And finally, in their recent analysis of the impact of alcopops on alcohol consumption and alcohol-related problems in Switzerland, Wicki and colleagues (2006) found alcopops not to be linked to specific riskier drinking patterns or consequences per se. Regarding the positive relationship between alcopops use, alcohol consumption, and negative consequences found in other studies they argue that in most studies total volume of alcohol use was not controlled for.

The current review is based on studies directly investigating alcopops in the context of adolescent drinking behaviour. Systematic computer-assisted searches in PubMed, PsycINFO and Addiction Abstracts were carried out using the keywords ‘alcopop’, ‘alcopops’, ‘designer drink’ or ‘designer drinks’. Criteria for inclusion were (i) relevance to the topic alcopops or designer drinks and their impact on adolescent drinking; (ii) publication in English, German, French, or Spanish. We also attempted to find articles that had not been included in the above named bibliographic databases by searching the World Wide Web and references in relevant articles using the same terms. Publications predominantly concerning medical, biochemical, pharmacological or dental topics were excluded. Employing this strategy, we found nine articles. These articles came from four countries: six from the UK, two from Switzerland and one from Sweden. In Table 1 the main characteristics and findings of these nine articles are described: the main topics concern (i) gender specific preference, the impact of alcopops on (ii) total alcohol consumption, (iii) the age of onset of alcohol use, (iv) the frequency of use and heavy episodic drinking, (v) the use of other drugs, and (vi) risk behaviours and negative consequences.

RESULTS

Gender specific beverage preferences
Existing studies indicate in unison that alcopops are preferred by girls, whereas boys more frequently report consuming beer (Sutherland and Willner, 1998; Roberts et al., 1999; Brain et al., 2000; Romanus, 2000). It is also evident that younger girls more regularly drink alcopops than conventional beverages (Roberts et al., 1999; Bundeszentrale für gesundheitliche Aufklärung, 2001). In the most recent ESPAD study, distinctive differences are to be found in the drink preferences of girls and boys. Boys prefer beer in three-quarters of the countries in which alcopops as well as the traditional beverages beer, wine, and spirits were included. Alcopops and spirits are each favoured by girls in one-third of the investigated countries (Hibell et al., 2004). These pronounced gender differences are corroborated by Brain et al. (2000), who reported that girls prefer to drink cider, alcopops, and aperitifs, while boys prefer lager. A study by Romanus (2000) also revealed that 62% of boys and 73% of girls in the ninth grade to be alcopop consumers. Moreover, girls reported higher frequencies of alcopop consumption as compared with boys.

Total alcohol consumption
Romanus (2000) compared Swedish survey data (telephone and school surveys) for different age groups across various times of measurement, selected in such a manner as to ensure that the market launch of alcopops occurred after the first time of measurement. A comparison of alcohol consumption data from telephone surveys in 1996 and 1998 revealed an increase in consumption for 16–24-year-olds of 6%. Given that 13% of the total quantity of consumed pure alcohol in 1998 comprised
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<th>Author name (year)</th>
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<td><strong>Brain et al. (2000)</strong></td>
<td>UK, one region of northwest England</td>
<td><strong>Quantitative:</strong> - Confidential self-report questionnaire • N: 721 • Age: 13–16 years</td>
<td><strong>Quantitative:</strong> • First choice drink: Hooch (alcopop) (20%) • Girls are more likely to drink ciders, alcopops or aperitifs while boys prefer lager • Younger adolescents and light drinkers drink cider and alcopops while older youth drink lager • Most amount of alcohol consumed with lager and cider, with alcopops lowest • Alcopop drinkers (first choice): 1/5 of young drinkers, predominantly female, young, more prosperous, less likely to indulge in risk behaviours <strong>Qualitative:</strong> • Gender specific preference</td>
<td><strong>Impact of alcopops on</strong> • Impact of alcopops on frequency of use and heavy episodic drinking • Impact of alcopops on risk behaviours and negative consequences</td>
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<td><strong>Griffiths and Sutherland (1998)</strong></td>
<td>UK, England 1997</td>
<td><strong>Questionnaire</strong> • N: 4516 • Age: 11–16 years</td>
<td>Drinks who preferred alcopops were more likely to gamble than those who preferred other types of alcohol</td>
<td><strong>Impact of alcopops on</strong> • Impact of alcopops on risk behaviours and negative consequences • Impact of alcopops on use of other drugs</td>
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<td><strong>Hughes et al. (1997)</strong></td>
<td>UK, Argyll, and Clyde Health Board area, west Scotland 1995</td>
<td><strong>Multistage cluster probability sample from the community health index (designer drinks = fortified fruit wines and strong white ciders)</strong> • Self-completion questionnaire • N: 824 • Age: 12–17 years</td>
<td>Consumption of designer drinks is associated with drinking in less controlled environments, heavier drinking, and greater drunkeness</td>
<td><strong>Impact of alcopops on</strong> • Impact of alcopops on frequency of use and heavy episodic drinking</td>
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<td><strong>Kuntsche et al. (2006)</strong></td>
<td>Switzerland 2003</td>
<td><strong>National representative sample of 8th–10th graders (Beverage preference based on last drinking occasion; Drinking motives: drinking motive questionnaire revised (DMQ-R))</strong> • N: 5379</td>
<td>Negative association between enhancement motives and a preference for wine and alcopops</td>
<td><strong>Impact of alcopops on</strong> • Impact of alcopops on frequency of use and heavy episodic drinking</td>
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<td><strong>McKeganey et al. (1996)</strong></td>
<td>UK, Dundee, Scotland 1994</td>
<td><strong>Sample (1 in 10) of all comprehensive school children in compulsory school years (five schools); questionnaire</strong> • N: 758 • Age: 12–15 years</td>
<td>Consumers of new drinks were found to be drinking alcohol more often</td>
<td><strong>Impact of alcopops on</strong> • Impact of alcopops on frequency of use and heavy episodic drinking</td>
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• Age: 11–16 years | • 17% reported consuming alcopops at least weekly  
• A minority of 11–16-year-olds reported drinking alcopops only  
• In the 11–12-year-old group, the increase in weekly drinking between 1994 and 1996 exactly matched the proportion drinking alcopops and no other alcoholic drink and half of the increase among 13–14-year-olds  
• Impact of alcopops on total alcohol consumption  
• Impact of alcopops on frequency of use and heavy episodic drinking  
• Impact of alcopops on age of onset of alcohol use  
• Gender specific preference  
• Impact of alcopops on total alcohol consumption  
• Impact of alcopops on age of onset of alcohol use  
• Gender specific preference | |
• N: approximately 2000 interviews each  
• Age: 16–24 years  
School surveys anonymous self-administered questionnaires, annually since 1971, randomly selected  
• Age: 15–16 years, every other year 12–13 years | • The introduction of alcopops accounted for approximately half of the increase in alcohol consumption by 15–16-year-old boys from 1996 to 1999, and for two-thirds of the increase among girls  
• Alcopops and ciders did not replace any other alcoholic beverage  
• Public debate on alcopops and cider; the sales of alcopops have been declining since 1997; sweet ciders have continued to increase; alcopops and sweet ciders have penetrated the youth market  
• Impact of alcopops on total alcohol consumption  
• Impact of alcopops on frequency of use and heavy episodic drinking  
• Gender specific preference | |
| Sutherland and Willner (1998) | UK, England 1997 | Classroom survey of the total population of pupils in six schools selected from different locations around England  
• N: 5383  
• Age: 11–16 years | • 46.8% of the drinkers preferred alcopops to other types of alcoholic drinks; greater in girls (56.4%) than in boys (37.1%), decreasing with age (62.9% at age 11; 37.7% at age 16)  
• Spirits drinkers were more likely to use cigarettes and drugs, and had been more frequently drunk, than either beer/wine or alcopops drinkers; these measures also tended to be higher in alcopop drinkers than in beer/wine drinkers, particularly among 11–13-year-old girls  
• Public debate on alcopops and cider; the sales of alcopops have been declining since 1997; sweet ciders have continued to increase; alcopops and sweet ciders have penetrated the youth market  
• Impact of alcopops on total alcohol consumption  
• Impact of alcopops on frequency of use and heavy episodic drinking  
• Gender specific preference  
• Impact of alcopops on total alcohol consumption  
• Impact of alcopops on age of onset of alcohol use  
• Gender specific preference | |
| Wicki et al. (2006) | Switzerland 2003 | Cross-sectional national representative sample; anonymous self-report questionnaire administered in classroom setting  
• N: 5444 (drinker)  
• Age: 13–16 years | • Earlier initiation of consumption, more frequent risky single occasion drinking (RSOD), and a higher likelihood of negative consequences for consumers than for non-consumers of alcopops were due mainly to higher overall consumption  
• Alcopops do not seem to be linked to specific riskier drinking patterns or consequences, they add to the problems caused by drinking and seem to be consumed in addition to conventional alcoholic beverages without replacing them  
• Other alcoholic beverages had similar effects, and whether the same amount of alcohol was consumed as alcopops or as any conventional alcoholic beverage made no difference  
• Impact of alcopops on total alcohol consumption  
• Impact of alcopops on age of onset of alcohol use  
• Impact of alcopops on risk behaviours and negative consequences  
• Impact of alcopops on frequency of use and heavy episodic drinking | |
alcopop consumption, the author infers an influential effect of alcopops. Data from school surveys also suggest that the consumption prevalence for any form of alcoholic drink slightly rose for girls and boys aged 12–13 years between the years 1995 and 1999. Following the introduction of alcopops in Sweden in the year 1996, survey data indicated a disproportionately high increase in alcohol consumption between the years 1996 and 1999: A 30% increase in total consumption of pure alcohol was observed for boys aged 15–16 years and a 35% increase for girls of the same age group. One-half of this surge was traced back to alcopops for boys and two-thirds for girls.

Roberts et al. (1999) analysed cross-sectional data on the alcohol consumption of 11–16-year-olds in Wales. The authors compared the prevalence in increase of weekly alcohol consumption between 1994 and 1996 with the proportion of pure and weekly alcopop drinkers in the year 1996. While the proportion of pure alcopop consumers in the youngest age group (11–12 years) corresponded to the increase, the proportion of pure alcopop consumers in the 13–14-year-olds covered approximately 50% of the increase. Alcopops had a considerably less influential effect on 15–16-year-old boys than girls.

Both studies reach the conclusion that the launch of alcopops is responsible for the observed increase in total alcohol consumption in adolescents. Romanus (2000) describes the alcopop-contingent increase in total prevalence with simultaneous decrease in prevalence of other alcoholic beverages found in the telephone survey as an interaction of two effects: Alcopops replace other alcoholic drinks and are also additionally consumed. In their cross-sectional investigation of Swiss adolescents, Wicki et al. (2006) conclude that alcopops are consumed in addition to, rather than as a replacement for other alcoholic beverages.

In the studies carried out by Roberts et al. (1999) and Romanus (2000), however, cross-sectional surveys were repeatedly performed, whereby earlier surveys without questions regarding alcopops were compared with more recent surveys including alcopop questions. Given that more beverage-specific questions on alcohol use generally result in higher volumes of reported alcohol use (Gmel and Rehm, 2004) the found increase in alcohol consumption may as well be confounded by differences in the alcohol measures. Furthermore, the comparisons rest on the assumption that, with the exception of the introduction of alcopops, all other conditions remained constant. Various factors, such as for example, changes in drinking behaviour or periodic effects could be responsible for the increase in alcohol consumption, independent of the availability of alcopops.

Onset of alcohol use and first intoxication

Trend analyses show a general tendency that children and adolescents first encounter alcohol at an increasingly earlier age. An earlier onset of alcohol use is associated with various alcohol-related problems: Young people who first come into contact with alcohol at a very young age often go on to develop problematic patterns of consumption (Forney et al., 1998; Kraus et al., 2000; Poikolainen et al., 2001; Andersen et al., 2003; Tucker et al., 2003). An earlier onset is also connected with more frequent drinking, heavy episodic drinking and earlier episodes of drunkenness (Fergusson et al., 1995; Hill et al., 2000; Chassin et al., 2002). Further evidence indicates that the earlier individuals begin drinking, the greater their probability of developing an alcohol dependency (Chou and Pickering, 1992; Grant and Dawson, 1997; Andersen et al., 2003). Moreover, more alcohol-related secondary problems arise when alcohol is consumed from a very early age (Gruber et al., 1996; Hingson et al., 2000; Hingson et al., 2001). These include violence, injuries, driving under the influence of alcohol and drugs, as well as an increased risk of consuming other drugs (Gruber et al., 1996). Individuals with an early onset of alcohol use are also more at risk for alcohol-related accidents (Hingson et al., 2000) and psychological conflicts under the influence of alcohol (Hingson et al., 2001).

While there is clear evidence of a forward shift in age at first use of alcohol, as well as of a relationship between early onset on the one hand and problematic consumption patterns and negative acute and chronic complications on the other, the single available study by Wicki et al. (2006) does not provide any indications that alcopop consumers begin consuming alcohol at an earlier age, nor that they have earlier experiences of intoxication with an accompanying higher risk of developing alcohol-related secondary problems. Interestingly, both Romanus (2000) and Roberts et al. (1999) infer an alcopop-contingent increase in alcohol consumption of adolescents in Sweden and Wales from their observations and argue that ‘...the introduction of alcopops/sweet ciders have contributed substantially ... to an earlier drinking debut in the youngest age group ...’ (Romanus, 2000, p. 618) and ‘...the arrival of alcopops on the market has been a factor in encouraging a new group of young drinkers to develop a regular drinking habit at an age earlier than might have been the case.’ (Roberts et al., 1999, p.13).

From the increase in the proportion of adolescents with a weekly consumption of alcohol (Roberts et al., 1999) and the increase in the proportion of alcohol consumers (Romanus, 2000), an increase in the number of young consumers can be deduced. An association between alcopop consumption and an early onset of alcohol use cannot, however, be inferred. In investigating the influence of type of drink on age at onset of drinking, a comparison of alcopop and non-alcopop consumers with respect to their age at onset of alcohol use is required.

Such a comparison was performed by Wicki et al. (2006). Irrespective of the average quantity of alcohol consumed, alcopop consumers began drinking at an earlier age than consumers of other alcoholic beverages. Since, however, this relationship was also found for beer, wine, cider, and spirits, i.e. consumers of these beverages also began drinking at an earlier age, the association cannot be considered to be alcopop-specific. This result may be connected with the definitions of alcopop, beer, wine, cider, and spirit consumers. Each individual who does not claim to have drunken alcopops, beer, wine, cider, or spirits, is defined as a consumer of the respective beverage. It is to be assumed that consumer groups strongly overlap, given a high likelihood that the majority of surveyed individuals have tried each of the listed
drinks at least once. Hence, it is rather the ‘drinkers of everything’ who begin drinking at an early age.

Wicki et al. (2006) further analysed the effect of quantity of alcopops consumed at the last given opportunity on drinking debut age and age at first intoxication, controlling for the consumption quantity accounted for by other alcoholic drinks. While a relationship was found, the effect was partially observed to be even greater for other alcoholic beverages, so that no further alcopop-specific effect appears to exist beyond total alcohol consumption.

Frequency of alcohol use and heavy episodic drinking

The frequency of alcohol consumption is associated with alcohol-related risk behaviours (Munro and Learmonth, 2004) and with problematic alcohol use (Gmel et al., 2001). A number of studies have also shown that the frequency of consumption relates to aggressive actions under the influence of alcohol (Wells et al., 2005) as well as to experimental and regular smoking of cigarettes and the consumption of illegal drugs (Donato et al., 1995). The risk of negative consequences, such as serious injuries, is considerably higher in the case of regular heavy episodic drinking (Castilla et al., 1999; Hill et al., 2000; Paljarvi et al., 2005). According to an investigation by Wechsler et al. (1994), regular heavy episodic drinkers more frequently experience symptoms of intoxication, negative consequences at school, unplanned and unprotected sexual intercourse, aggressive conflicts with friends, loss or damage of property, and trouble with the police.

If indications that alcopop consumers in comparison to non-alcopop consumers more frequently drink alcohol or are more frequently intoxicated are found, then this would speak in favour of the assumption that alcopops are related to increased risk behaviour. In their studies of 12–15-year-old school pupils in Dundee (McKeganey et al., 1996) and 12–17-year-olds in Argyll and Clyde (Hughes et al., 1997), the authors come to the conclusion that alcopop drinkers tend to more frequently consume alcohol and are more often intoxicated. In addition, alcopop consumers, in contrast to non-alcopop consumers, more commonly demonstrate aggressive and antisocial behaviour (Hughes et al., 1997). An investigation of 11–16-year-old pupils from six schools in England also suggests that heavy episodic drinking tends to more habitually occur among alcopop consumers (Sutherland and Willner, 1998).

All three studies failed, however, to control for total quantity of consumed alcohol. Assuming, for example, that those individuals who drink more frequently, or are more often intoxicated, consume other alcoholic beverages in addition to alcopops, it follows that while alcopops are indeed correlated with more heavy consumption and more regular intoxication, the association is also valid for other forms of alcohol and is not alcopop-specific. Furthermore, the significance of the study carried out by McKeganey et al. (1996) is severely limited by the subsumption of ‘new’ and ‘old’ drinks (Crawford and Allsop, 1996) as well as by the data collection, which took place seven months prior to the official introduction of alcopops onto the British market (McKibben, 1996). The suggested increased probability of risk behaviour cannot clearly be attributed to alcopops: The definition of designer drinks employed by Hughes et al. (1997) refers to cider and fortified wines with an alcoholic content ranging between 13 and 21% (Catterson et al., 1997).

Results of a study by Brain et al. (2000) oppose the assumption that alcopop drinkers more frequently consume alcohol, are more often intoxicated, and demonstrate more risk behaviour. In their study in northwest England, non-alcopop consumers proved more at risk for regular alcohol and tobacco use, experimental dealings with drugs, being arrested or stopped by the police, and being convicted. The neglected total quantity of alcohol, however, once again prevents conclusions pertaining to the specific effect of alcopops. Analyses of the influence of alcopop consumption on the frequency of alcohol use and the frequency of risky single occasion drinking in the study carried out by Wicki and colleagues (2006) found no alcopop-specific effects beyond the general influence of consumed quantity. Furthermore Kuntsche et al. (2006) investigated beverage preference, drinking motives, and alcohol use in adolescence. According to their results, adolescents who preferred alcopops and had social drinking motives drank less than those who did not prefer alcopops. In this study, drinking motives were identified as explanatory factors for the association between beverage preference and alcohol use.

An investigation by Roberts et al. (1999) also contradicts an increasingly occurring pattern of heavy episodic drinking among adolescent alcopop consumers. Alcopop drinkers were less likely to have consumed large quantities of alcohol at the last given opportunity, or consumed alcohol in the past week. In investigating acute intoxications and accidents as well as emergency admissions, Crossland and Potier de la Morandiere (2001) found no evidence of a significant influence of alcopops for 13–15-year-old adolescent in-patients in England.

Use of other drugs

A large number of investigations have established that adolescent alcohol consumption frequency occurs in combination with the smoking of cigarettes (Johnson and O’Malley, 2003; Windle, 2003; Wilson et al., 2005). Moreover, adolescents who have already consumed alcohol are more likely to take cannabis (Young et al., 2002; Wilson et al., 2005) or other illegal drugs (Sakai et al., 2004; Grant et al., 2006). To date, only one study has provided evidence of a possible link between the consumption of alcopops and cigarettes and illegal drugs. A survey of 11–16-year-old pupils in five English schools showed that adolescents who prefer alcopops, as opposed to those favouring beer or wine, were more likely to smoke or take drugs (Sutherland and Willner, 1998). The risk was highest for those young people who claimed to prefer spirits. Adolescent alcopop drinkers who played the lottery drank more and consumed more drugs, as compared with non-lottery players (Griffiths and Sutherland, 1998). Since this study also did not control for total quantity of alcohol indications of a greater use of cigarettes and illegal drugs among adolescents preferring alcopops cannot clearly be attributed to the consumption of alcopops.
**Risk behaviour and negative consequences**

Risk behaviours can be conceived as all behaviours possessing damage potential with respect to one’s own life, or the environment, or living conditions (Raithel, 2001). The spectrum of adolescent risk behaviours can be related to various behavioural domains and levels. In terms of alcopop consumption, risk behaviours are to be considered which are related to substance consumption, in addition to the consumption itself. Although only few studies have examined the relationship between alcopop consumption and negative consequences such as delinquency or problems at school or in the family, this factor also formed the basis of the political decision to take preventative measures.

Studies by Hughes et al. (1997) and Griffiths and Sutherland (1998) indicate that alcopop consumers show more delinquent behaviour than consumers of other alcoholic beverages. According to the investigation by Hughes et al. (1997), alcopop (defined as cider and fortified wines with an alcoholic content between 13 and 21%) consumers demonstrated more pronouencedly aggressive and antisocial behaviour than consumers of other alcoholic drinks. Griffiths and Sutherland (1998) found that adolescents whose favourite drink was alcopops were more likely to play the lottery and scratch cards. The assumption of increased delinquency among alcopop consumers is refuted by the investigations performed by Brain et al. (2000) and Sutherland and Willner (1998). Brain et al. (2000) found that only few adolescent alcopop consumers exhibit delinquent behaviour. Sutherland and Willner (1998) also observed young alcopop consumers to be less delinquent than spirit consumers, though more delinquent than beer drinkers. In comparison to spirit consumers they were less at risk, and in comparison to beer drinkers, more at risk of being arrested or stopped by the police, convic ted, of carrying out unprotected sexual intercourse, or having sexual contact which were later regretted. No additional effects were found for adult alcopop consumers compared with consumers of other alcoholic beverages. None of these studies, however, controlled for quantity of alcohol consumption.

In the investigation carried out by Wicks et al. (2006), alcopop consumers in comparison to non-alcopop consumers showed a higher risk for physical conflicts, accidents, problems with parents, poorer school achievements, and risky or regretful sexual intercourse when total alcohol consumption is not controlled for. Following the inclusion of quantity of other consumed alcoholic beverages, the risks associated with alcopops were even lower.

**DISCUSSION AND CONCLUSIONS**

Alcopops enjoy particular popularity among adolescents and young adults. This led to a massive surge in the sale and consumption of the drinks, beginning in the UK and spreading to various countries of the European Union. The success of this new form of drink has been attributed to its sweet flavour, specific design, adolescent-tailored advertising, and associated image. These attributes have caused the drinks to be suspected of prematurely tempting, in particular, female adolescents to alcohol consumption. Furthermore, the drinks have been made responsible for more frequent alcohol consumption and more regular consumption up to the point of intoxication. Accordingly, alcopops are considered to represent a risk factor for alcohol-related problems.

The review of results from investigations of alcopop consumption and its impact on an early onset of alcohol use, more frequent alcohol consumption, heavy episodic drinking, and negative alcohol-related consequences show that there is scarce evidence of a relationship between the consumption of alcopops and the described effects. In order to identify alcopop consumption as a risk factor for a certain outcome, for example, an earlier onset, it would be necessary to prove that the outcome remains absent when exposition to alcopops is not given.

**Empirical evidence**

For obvious ethical reasons, investigations with a high grade of evidence, in which individuals are randomly assigned to an exposition condition (alcopop consumption) in order to control for potential confounding variables, do not exist. Neither have relevant results been yielded in the context of cohort or case-control studies, which at least allow known explanatory factors to be controlled for (see Rothman and Greenland, 1998). The evidence provided by the results rather rests on data from cross-sectional investigations, the very least of which have attempted to control for known confounders such as the total quantity of consumed alcohol. Comparisons of alcopop and non-alcopop consumers, with their resulting alcopop effect, are misleading, given that they fail to provide evidence of an alcopop-specific effect, i.e. that alcopops increase certain risks above and beyond the known effects of total alcohol consumption.

**Confounding**

The greatest danger of confounding in the presented studies most probably lies in the self-selection of comparison groups with and without alcopop consumption. Individuals who prove similar in beginning to consume alcohol at an early age, regularly partaking in heavy episodic drinking and tending towards deviant behaviour, drink alcopops in addition to more traditional alcoholic beverages. The so-defined group of alcopop consumers indeed differs from a comparison group of non-consumers in relevant outcome variables (e.g. earlier onset); the underlying causal mechanism is, however, not explained by the consumption of alcopops, but rather by the total quantity of consumed alcohol.

According to Jessor (1986, 1998), the use of alcohol or drugs can assume a number of functions in coping with developmental tasks and problems during adolescence. Here, several different risk behaviours can be adopted to reach the very same goal and are thus equifinal. This behaviour fulfills particular functions such as the opposition of society or solidarity with peers, and can be understood as an attempt to achieve certain goals, which would otherwise be unattainable. Varying problematic behaviours can be viewed as an expression of a single syndrome. The cumulative and combined occurrence of different risk behaviours has been demonstrated in numerous studies (Loeber, 1998; Nelson and Wittchen, 1998; Castilla et al., 1999; Raithel, 1999).
Additive effect

Despite the fact that no evidence of a significant contribution of alcopops to an earlier onset, or more regular heavy episodic drinking can be derived from the studies considered in this review, alcopops constitute a substantial additional proportion to total alcohol consumption. Furthermore, the association between alcopop consumption and quantity of alcohol consumed indicated that those who drink heavily also drink alcopops. Analyses that adjusted consumption quantity indicate no specific effects of alcopops, beyond that of total quantity of consumed alcohol. From the fact that the majority of alcopop consumers also drink other alcoholic beverages, it can, in turn, be concluded that reducing the availability of alcopops would most probably have no effect on total alcohol consumption, and hence, alcohol-related problems, so long as other alcoholic beverages remain as widely available as they currently are. Only for those adolescents who only drink alcopops and would not drink any alcoholic beverage if there were no alcopops, a special tax on alcopops would be reasonable. According to the investigation of Roberts et al. (1999) only a minority reported consuming alcopops only (4% of boys and 3% of girls among 11–12-year-olds; 4% of boys and 5% of girls among 13–14-year-olds; and 3% of boys and 8% of girls among 15–16-year-olds).

Special taxes on alcopops

After the introduction of higher alcopop taxes in Germany and in Switzerland, the consumption of spirit-based alcopops declined moderately with respect to frequency and quantity (Bundeszentrale für gesundheitliche Aufklärung, 2005; Schmid et al., 2007). In Germany, for example, following the legislative measures 63% of young people stated that alcopops were too expensive as a reason for the reduced consumption of spirit-based alcopops. The drop in alcopop consumption observed in Germany was also reflected in national revenue figures. Due to the decline in turnover of spirit-based alcopops, tax revenue was considerably smaller than foreseen (Deutsche Bundesregierung, 2005). Interestingly, an almost identical decline in alcopop consumption was also observed in Austria, where no comparative tax increase had been introduced (Uhl, 2007). Despite available evidence pertaining to the effectiveness of tax measures (see Babor et al., 2003), the observed parallel reduction in the consumption of alcopops in both countries suggests that factors other than the given tax increase may have played a role.

CONCLUSIONS

The results of the few methodologically sound investigations of alcopop consumption do not support the assumption of alcopop-specific effects beyond those of total quantity of consumed alcohol. The literature so far provides no evidence to underpin the arguments brought forward in public discussions press for a special treatment of alcopops. Findings rather indicate a clear relationship between quantity of consumed alcohol and alcohol-related negative consequences. Even though tax measures have been proven to be effective, there is little evidence that the reduction of a certain drink will influence total alcohol consumption when the availability of other beverages remains unchanged.

Hence, from the evidence provided no significant effects of preventative measures which do not total the quantity of consumed alcohol can be expected. Strategies which look to impose a specific instead of a general tax increase, or in some EU countries the establishment and enforcement of a general age limit for all alcoholic drinks, permit the alcohol industry to constantly be one step ahead. The alcohol industry has long since responded to tax measures with the manufacturing of alcopops which are wine or beer-based instead of spirit-based, in order to bypass the alcopop tax law. For example this can be seen in the results of a pre-post investigation of the effectiveness of the tax increase on spirit-based alcopops in Germany: The drop in quantity of pure alcohol consumed in the form of spirit-based alcopops was for the most part compensated by the quantity of ethanol consumed in beer and wine-based alcopops (Bundeszentrale für gesundheitliche Aufklärung, 2005). From a preventative viewpoint, this not only represents a lack of progress, but also a step in the wrong direction. Beer and wine-based alcopops are not subject to special taxes and are thus cheaper, plus, in contrast to spirit-based alcopops which can be served to young people over the age of 18 years, the minimum age for beer and wine-based alcopops is 16 years.

CONFLICTS OF INTEREST

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C. METZNER AND L. KRAUS


