

# Personal experiences of drinking and alcohol-related risk perceptions: The importance of the subjective dimension

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## ABSTRACT

**AIMS** – To explore the association between subjective experiences of drinking and alcohol-related risk perceptions. **METHODS** – The data is based on a questionnaire with questions about beliefs, use habits and experiences of alcohol and tobacco sent to a random sample of 3,000 Swedes aged 18 to 70 years (response rate= 1,623 individuals, or 54%). In this study, those respondents who had ever been drinking alcohol were included (1,536 individuals). The data were analysed statistically by cross tabs and multiple logistic regression. **RESULTS** – With some exceptions, the results generally showed that differences in subjective experiences of drinking were related to risk perceptions of alcohol consumption. In particular, those who had more negative than positive subjective experiences of alcohol consumption had substantially higher risk perceptions than those who had more positive than negative experiences, controlling for alcohol consumption and potential confounders. There were also several significant differences between individuals differently involved in alcohol consumption, net of subjective experiences. **CONCLUSIONS** – Subjective experiences of alcohol consumption appear to be an important construct in relation to alcohol-related risk perceptions. To understand the link between personal experiences and risk perceptions pertaining to alcohol consumption, both objective measures of personal experiences and subjective measures should be considered.

**KEY WORDS** – risk perceptions, alcohol, subjective experiences, behavioural experience.

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## Introduction

The aim of this paper is to explore the relationship between people's subjective experiences of drinking and their alcohol-related risk perceptions. Personal experiences are in different research fields assumed to affect people's beliefs, including their risk perceptions, and experimental evidence suggests that people assign greater informational value to personal experiences than to indirect experiences (Simonsohn et al. 2008). Delineating how personal experiences are linked to risk perceptions is thus an important theoretical issue across

all fields interested in this issue. Previous research, however, indicates "that the relationship is complex" (Twigger-Ross & Breakwell 1999, 81), and it is obvious that more work is needed on this general link.

When trying to untangle this relationship, it is arguably useful to bear in mind that the concept of experience entails different dimensions (Barnett & Breakwell 2001), where a rough distinction can be drawn between an objective and a subjective dimension. The objective dimension may, for example, refer to whether

an individual actually has engaged in a particularly activity such as drinking alcohol, whereas the subjective dimension may refer to how this individual evaluates this experience (for example, as pleasant/unpleasant). It is also possible that people with similar objective experiences may sometimes subjectively evaluate these experiences differently. To understand how personal experiences are related to risk perceptions, the subjective dimension seems important to consider. However, few studies have analysed the relationship between subjective experiences and risk perceptions regarding alcohol consumption (or other substance use). Most studies have instead focused on the association between behavioural experience as such (that is, consumption patterns) and risk perceptions (see, for instance, Agostinelli & Miller 1994; Miller et al. 2009).

In focusing on subjective experiences of drinking, this paper may also inform preventive initiatives that target people's risk perceptions. Policymakers commonly fail to acknowledge that the impact of health-related information may be counteracted by personal experiences that tell a different story about the risks involved (see Baron et al. 2008). It therefore seems crucial in intervention contexts to pay attention to the personal experiences that people have with a potentially health-affecting behaviour such as drinking. To the extent that people's subjective experiences of alcohol consumption shape their risk perceptions, this study can pinpoint situations where the prospect for effective risk communication is favourable (when people have mainly negative experiences) and where it is less favourable (when people have mainly positive experiences).

### **Assessing the relationship between personal experiences and risk perceptions: alternative approaches**

The association between personal experience and risk perceptions has been assessed in several research areas and with different approaches. The different approaches may broadly be divided according to how they measure personal experiences: 1) studies focusing on behavioural experience as such (or the extent to which people have engaged in a particular behaviour); 2) studies focusing on specific, "objective" negative events experienced following behavioural engagement (such as an injury following alcohol consumption); and 3) studies focusing on subjective evaluations of the experiences (henceforth called subjective experiences).

The first approach is the most common in the area of substance use, and most studies have documented a negative association between substance use and risk perceptions (Agostinelli & Miller, 1994; Benthin et al. 1993; Hemmelstein 1995; Karlsson 2006; Miller et al. 2009). That is, people who have engaged more in substance use rate the risks associated with substance use as lower than people without, or with less, behavioural experience. It should be noted, though, that some of these studies were not specifically designed to assess the relationship between personal experiences on risk perceptions. The association between behavioural experiences and risk perceptions may also reflect an effect of the latter on the former. The beliefs that people hold about potential consequences of engaging in a particular behaviour are by several theories assumed to impact upon their behaviour (see, for example, Wein-

stein 1993). Panel studies also show that both these factors affect each other when it comes to substance use (Aas et al. 1998; Gerrard et al. 1996). It is therefore probably questionable to assume only effects in one direction between these variables.

The potential explanations for the impact of behavioural experience on risk perceptions that have been highlighted in this line of research have to a large extent emphasised various forms of "rationalisations" among those more engaged in substance use. For example, Agostinelli and Miller (1994) have interpreted the relationship according to "self-serving motives" (327). More heavily involved users provide, allegedly, lower risk ratings because they attempt to justify their behaviours: "by lowering their own judgments of the negative consequences associated with their behaviours, they can protect themselves from threatening self-knowledge" (Agostinelli & Miller 1994, 328.). To some extent, concerning the important role assigned to "rationalisations", this view agrees with how the link between past behaviour and beliefs (or future behaviour) is explained by cognitive dissonance theory, which basically asserts that people strive for consistency between how they behave and what they believe (Harmon-Jones & Mills 1999). According to this view, if people do something that they know may be dangerous, they tend to downplay the negative sides in order to avoid cognitive dissonance, an alleged unpleasant feeling.

The lower risk perceptions observed among individuals with greater behavioural experiences could also be down to few negative experiences of substance use in this group (Halpern-Felsher et al. 2001;

Millstein & Halpern-Felsher 2002). From this perspective, it is the different "qualities" (Twigger-Ross & Breakwell 1999, 81) of the experiences that explain the link between behavioural experience and risk perceptions. As Millstein and Halpern-Felsher (2002) emphasise with regard to adolescents, the likelihood that one will harm oneself from risky behaviours is often quite small compared to the likelihood that one will be experiencing positive effects, something that people learn once they initiate such behaviours (see also Barron et al. 2008). It is thus possible that the experiences of drinking differ between user categories, which would explain the association between behavioural experiences and perceived risk. Studies show that college students who drink alcohol experience positive consequences more often than negative consequences (Lee et al. 2010; Park 2004) and that children tend to have mostly negative alcohol-related beliefs but that the beliefs tend to be more positive after their drinking debut (see Leigh & Stacy 2004).

Studies that pay attention to specific, "objective" negative events experienced following behavioural engagement have given mixed results. Slater and Rasinski (2005) found that people who had experienced first or second-hand "alcohol-related assault, crashes or injuries" (816) rated the risks associated with these as higher than those without such experiences. Greening et al. (2005) demonstrated that experiences of negative events (such as bicycle injuries) among youths were associated with higher risk judgements on these events. Roe-Berning and Straker (1997) found experiences of or "exposure" to "traumatic events", such as criminal

violence, to be associated with higher risk perceptions regarding these events. In contrast, Halpern-Felsher et al. (2001) detected no difference in risk perceptions on alcohol consumption and sexual behaviours between those who had negative experiences associated with these behaviours and those who had not. Also, Kilmer et al. (2007) found no differences in risk perceptions on marijuana use between users who had experienced negative consequences of marijuana use and those who had not.

An implicit assumption in studies assessing the association of "objective" negative experiences to risk perceptions is that particular events, once experienced, affect different individuals' risk perceptions equally. It seems plausible, however, that the effect of a particular negative experience differs according to how people evaluate its "severity" (Weinstein 1989). An alternative design in studies of the link between personal experiences and risk perceptions is therefore to ask people about their subjective experiences of engaging in the particular behaviour in question.

Very few studies in the substance use area – or in other research areas – have assessed the association between subjective experience and risk perceptions. Denscombe (2001), in a qualitative analysis among youth, demonstrated that what he refers to as "critical incidents" have little impact as such on health-related risk perceptions. Rather, he argues, what is decisive is the "meaning" that people assign to these: "there is a clear warning about the dangers of identifying critical incidents on the basis of 'objective' criteria...if events that are objectively similar...can have different repercussions [which was shown]...

it is because the events can evoke different meanings" (Denscombe 2001, 303).

The current study adds to previous research by focusing on the link between subjective experiences and risk perceptions in a sample of the adult population in Sweden. I use a simple measure that captures people's overall evaluation as to whether their positive experiences of alcohol consumption outweigh their negative experiences or vice versa. While people well may have experienced several negative consequences of substance use, it is possible that these only constitute a minor part of the "pool" of experienced consequences (see Lee et al. 2010, for a similar point)<sup>2</sup>. The positive experiences may on balance be greater than the negative experiences (Lee et al. 2010), and failing to take this into account may obscure the relationship of personal experiences to risk perceptions (but see Breakwell & Barnett 2001, for a study failing to find an association between people's subjective experiences and risk perceptions for activities carried out voluntarily)<sup>3</sup>. A central point of departure for this study is thus that it is not necessarily the number of experienced consequences that matters the most, but rather the balance or ratio between (subjectively) experienced negative and positive consequences (see also Pomerleau et al. 1998, for the use of a similar measure). Although it has been shown that heavier alcohol consumers experience both more positive and negative consequences (Mäkelä & Mustonen 2000; Park 2004), the ratio of negative to positive experiences is possibly lower in this group compared to lighter users.

## Method

### *Data*

A questionnaire with a main focus on beliefs, use habits and experiences of alcohol and tobacco use was mailed to a national, random sample of 3,000 Swedes aged 18 to 70 drawn from the Swedish Address and Population Register (SPAR). SPAR is a public register that includes all persons registered in Sweden. The questionnaire was included as part of a research project on experienced and perceived positive and negative consequences of substance use among Swedish people. A cover letter informed participants about the research and also included short instructions on how to fill out the questionnaire. Confidentiality was ensured, and participants were told that all personal information would be destroyed after the data collection phase was completed. A returned, filled-out questionnaire was assumed to imply informed consent. Reminders (totaly three) were sent to individuals who did not return their questionnaire. In all, 1,623 individuals returned the questionnaire, which yields a response rate of 54 %. The data collection was carried out between March and June 2008. TNS Gallup, a market research company, was responsible for data collection. TNS Gallup delivered the questionnaires (not including any personal information about study participants) and an anonymous data file to me after the data collection phase was completed. The subsample included in the current analysis consists of individuals who have ever been drinking alcohol ( $n = 1,536$ , or 95 % of the full sample). Because the study was concerned with personal experiences of drinking alcohol, lifetime abstainers were excluded from the analyses.

### *Measures*

Risk perceptions of drinking alcohol were measured by two questions. Since personal risk was addressed, the questions were "conditional", as recommended (Brewer et al. 2007; Millstein & Halpern-Felsher 2002). Participants were instructed to rate the risk to health if they were to (1) drink six "glasses" of alcohol during one day once a month and (2) drink two "glasses" of alcohol every day for ten years. Six "glasses" of alcohol was defined as, for example, 200 cl strong beer or 75 cl wine. Two "glasses" was determined as, for example, 66 cl strong beer and 20–30 cl wine. These specifications were based on transformations of the amount of different alcoholic beverages that are equivalent to "one standard glass", as specified in a Swedish version of the consumption questions in the Alcohol Use Disorders Identification Test (that is, AUDIT-C; see, for example, Dawson et al. 2005), and which is used by the Swedish National Board of Public Health in their National Public Health Survey (<http://www.fhi.se/Statistik-uppfoljning/Nationella-folkhalsoenkaten/>). The response options for both questions were "very great risk", "quite great risk", "quite small risk" and "no risk". In the analyses reported below, the risk perception variables are dichotomised ("very great risk"=1)<sup>4</sup>

It should be noted that the phrasing of these two risk perception questions differed slightly, which may to some extent have affected the results, although the significance of this should probably not be exaggerated. The first question asked "How great do you think the risk is that your health will be harmed if you...[drink 6 'glasses' of alcohol during the same day once a month?]", whereas the second

question read as "Imagine that you would drink two 'glasses' of alcohol every day for 10 years. How great do you think the risk is that this would lead to... [worse health in general?]"

Subjective experiences were measured by the question "Overall, have your experiences of drinking alcohol mainly been positive or negative?". The response options ranged from (1) "more positive than negative experiences" to (5) "more negative than positive experiences", with a neutral response (3) in between. This single question measure of subjective experiences is somewhat crude and as such cannot show the type of consequences that people may have experienced from substance use. This is a limitation that should be considered when interpreting the results.

Using a question adopted from the AUDIT-C (see, for example, Dawson et al. 2005), drinking behaviour was measured as follows. Those who had been drinking alcohol 2–3 times a week or more often during the last 12 months were classified as "frequent drinkers". Those who reported that they had been drinking 2–4 times a month during the past year were classified as "regular drinkers", whereas those who had been drinking alcohol once a month or less during the last 12 months were labelled as "occasional drinkers". Finally, individuals who had not been drinking alcohol during the last 12 months were classified as "former drinkers".

Gender, age, education and second-hand negative experiences (of health problems probably attributable to alcohol consumption among family members or close friends; response options: "yes", "no" and "don't know") were included in the multivariate logistic regression. Age was meas-

ured in years, and the education variable distinguished between three categories here called "low" (pre-secondary education), "medium" (secondary education or post-secondary education less than three years), and "high" (at least three years of post-secondary education). Since the question of second-hand negative experiences did not define what kind of outcomes are included in the general expression "health problems", the participants may have thought about different outcomes when answering this question.

### *Statistical analyses*

The data were analysed by cross tabs and multiple logistic regression. In the logistic regression, all independent variables were entered simultaneously. The independent variables of main interest in this analysis were subjective experiences of drinking and actual drinking behaviour during the past year, with the other variables treated as controls.

## **Results**

### *Descriptive results*

Descriptive statistics for included variables is shown in table 1. The respondents' risk perceptions of drinking were related to the consumption patterns to which the risk perception measures refer (see table 1). Looking at risk perceptions of drinking six "glasses" of alcohol during one day once a month, we find that about a quarter felt that the risk was very great. More than half the sample (52.6 %) stated that there is a very great risk associated with drinking two glasses a day for ten years.

The experiences of drinking alcohol were rather positive overall, with more than six in ten stating that their experienc-

**Table 1.** Descriptive statistics for included variables.

	<i>n</i>	Per cent
Gender		
Male	698	45.7
Female	831	54.3
Age (M, SD)	1532	45.5(14.6)
Education <sup>a</sup>		
Low	252	16.5
Medium	835	54.8
High	437	28.7
Drinking behaviour last 12 months		
Frequent drinkers	315	20.6
Regular drinkers	713	46.7
Occasional drinkers	416	27.2
Former drinkers	83	5.4
Subjective experiences drinking		
More positive	607	39.9
Somewhat more positive	331	21.8
Neither positive nor negative (neutral)	383	25.2
Somewhat more negative	107	7.0
More negative	93	6.1
Second hand negative experiences		
Yes	465	30.6
No/ don't know	1055	69.4
Perceived risk of drinking 6 'glasses' during one day once a month		
Very great risk	339	22.7
Quite great risk	503	33.6
Quite small risk	585	39.1
No risk at all	68	4.5
Perceived risk of drinking 2 'glasses' every day for ten years		
Very great risk	787	52.6
Quite great risk	459	30.7
Quite small risk	209	14.0
No risk at all	41	2.7

<sup>a</sup>Low= pre-secondary education, Medium= secondary education or post-secondary education less than 3 years, High= at least three years post-secondary education.

es were either more positive or somewhat more positive (see table 1). Only 13.1% had more negative experiences than positive experiences or somewhat more negative experiences than positive experiences, and about a quarter had neither positive nor negative experiences. About a third reported that they had second-hand negative experiences of drinking. A small fraction were former drinkers during the last year, whereas close to half the sample

were regular drinkers. About 20% were frequent drinkers. Females were somewhat overrepresented among participants, and the majority of the sample had a medium level of education.

#### *The relationship of personal experiences to risk perceptions*

Table 2 shows the share of participants with different subjective experiences who responded that there was a very great risk



**Table 2.** Perceived risk of different drinking habits, by subjective experiences of drinking, per cent in each category of drinking experiences.

	Very great perceived risk of drinking 6 'glasses' during one day once a month <sup>a</sup>	Very great perceived risk of drinking two 'glasses' every day for ten years <sup>b</sup>
Subjective experiences		
More positive	16.2	43.4
Somewhat more positive	13.4	50.6
Neutral	33.6	61.0
Somewhat more negative	27.6	64.4
More negative	46.7	73.6
<i>n</i>	1482	1484

<sup>a</sup>Differences in very great perceived risk of drinking 6 'glasses' of alcohol during one day once a month between subjective experiences categories are significant at  $p<0.001$  ( $\chi^2=86.582$ ,  $df=4$ )

<sup>b</sup>Differences in very great perceived risk of drinking two 'glasses' of alcohol every day for ten years between subjective experiences categories are significant at  $p<0.001$  ( $\chi^2=53.017$ ,  $df=4$ )

associated with the two different drinking patterns covered. There were several differences between those who had more or somewhat more positive experiences and those who had more or somewhat more negative experiences. For example, close to 50 % among those with more negative experiences stated that there was a very great risk associated with drinking 6 "glasses" of alcohol on one day once a month, compared with slightly more than 15 % in the group with more positive experiences. There was also a large difference between these two "extreme groups" in the perceived risk of drinking two "glasses" of alcohol every day for ten years. There were also differences between the two groups having more positive than negative experiences and those with neutral experiences in both outcomes.

While the differences between the two "positive groups" and the three other groups were generally logical and quite

easy to interpret across both outcomes, the comparisons between the other groups displayed a somewhat more ambiguous picture of the responses to the question measuring the perceived risk of drinking 6 "glasses" during one day once a month. In this outcome, a larger share within the neutral group than within the group with somewhat more negative experiences responded that they perceived a very great risk. In the other outcome, however, a more theoretically logical result was found.

Table 3 presents the distribution of subjective experiences among the different categories of alcohol consumers (as measured by drinking behaviour during the last 12 months). As noted above, it is plausible that the relationship between behavioural experience and risk perceptions is attributable to different kinds of subjective experiences among people differently involved in alcohol consumption. Table 3 shows a consistent pattern of different



**Table 3.** Subjective experiences of alcohol consumption by drinking behaviour last 12 months. Per cent (n=1517)

	More positive	Somewhat more positive	Neutral	Somewhat more negative	More negative
Frequent drinkers	57.8	23.6	15.3	1.9	1.3
Regular drinkers	44.9	23.2	24.4	5.8	1.7
Occasional drinkers	23.2	20.8	35.2	10.8	10.0
Former drinkers	10.8	8.4	19.3	18.1	43.4

**Note:** Differences in subjective experiences of drinking between drinking categories are significant at  $p < 0.001$  ( $\chi^2 = 382.468$ ,  $df = 12$ )

distributions of subjective experiences of drinking among the different categories of alcohol consumers. The largest difference, as could be expected, in the distribution of subjective experiences was found between frequent drinkers and former drinkers. For instance, more than 80 % of the frequent drinkers reported having more positive or somewhat more positive experiences, compared to former drinkers, of whom slightly less than 20 % had more positive or somewhat more positive than negative experiences. Almost six in ten among the frequent consumers reported having more positive experiences (the most "extreme" positive response option). Moreover, only about 3 % of the frequent drinkers reported having more or somewhat more negative experiences, compared to more than 60 % among the non-drinkers.

Logistic regression analyses were estimated to further explore the relationship between subjective experiences of alcohol consumption and risk perceptions (very great risk=1). Results are shown in table 4. Table 4 displays a consistent difference between those who had more positive experiences and those who had more negative experiences (both "extreme groups"), controlling for gender, age, education, drinking behaviour during the last 12 months

and second-hand negative experiences. There were also statistically significant differences between the group with more positive experiences and the neutral group across both outcomes. A significant difference was found between the group having more positive experiences than negative experiences and the group having somewhat more negative experiences in the second outcome, but not in the first outcome.

Regarding behavioural experience (that is, drinking behaviour in the last 12 months), there were considerable differences between frequent drinkers and former drinkers across both measures, controlling for subjective experiences and the other variables. The other categories of drinkers also differed from frequent drinkers in both types of risk perception outcomes.

## Discussion

Across different research fields, including the substance use field, personal experiences are assumed to affect beliefs such as risk perceptions. This paper employed a subjective measure of experience to study the association of personal experience of drinking to risk perceptions on alcohol consumption. The results show that individuals who evaluate their experiences more positively than negatively have lower

**Table 4.** Logistic regression analyses estimating the association between subjective experiences of drinking and very great perceived risk of drinking (very great risk=1), with control for drinking behaviour last 12 months and potential confounders. Odds ratios.

	Very great perceived risk of drinking 6 'glasses' during one day once a month	Very great perceived risk of drinking 2 'glasses' every day for ten years
Gender		
Female	1.00	1.00
Male	0.49***	0.53***
Age	1.02***	0.99**
Education		
Low	1.00	1.00
Intermediate	1.05	1.04
High	1.24	0.99
Drinking behaviour last 12 months		
Frequent drinker	1.00	1.00
Regular drinker	1.92**	2.96***
Occasional drinker	2.18***	2.86***
Former drinker	3.56***	4.57***
Subjective experiences		
More positive	1.00	1.00
Somewhat more positive	0.79	1.28
Neutral	2.35***	1.78***
Somewhat more negative	1.64	1.89**
More negative	3.08***	2.48**
Second hand negative experiences		
No/don't know	1.00	1.00
Yes	1.02	1.08
n	1450	1452

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ .

risk perceptions of drinking than individuals whose experiences are more negative. A consistent difference was also found between the group with more positive experiences and the neutral group. There were some exceptions: for example, no significant difference was found between individuals having more positive experiences and individuals having somewhat more negative experiences in risk perceptions on drinking 6 "glasses" during one day once a month in the logistic regressions. But overall, the results generally showed that subjective experiences of drinking are related to the way people perceive risks of alcohol consumption. A more precise understanding of the determinants of alcohol-related risk perceptions, then, should probably take into account this subjective

dimension to alcohol-related experiences.

An important finding is that, although the distributions of subjective experiences differed appreciably between different categories of drinkers, a differential remained in risk perceptions between drinking groups when subjective experience was controlled. This suggests that both subjective experiences and other factors produce the link between substance use and substance use related risk perceptions observed in this and other studies (Agostinelli & Miller 1994; Benthin et al. 1993; Hemmelstein 1995; Karlsson 2006; Miller et al. 2009). However, caution is needed when interpreting the "residual" association" (the part of the association that is not attributable to variations in subjective experiences) between alcohol consumption and

risk perceptions. Research shows that the relationship between substance use beliefs and substance use is of a reciprocal kind (Aas et al. 1998; Gerrard et al. 1996). The effect of behavioural experience on risk perceptions is therefore probably smaller than what the present estimates suggest.

Although this study did not consider the separate question of the "correctness" of the risk perceptions, it should be stressed that the lower risk ratings among those with more behavioural experience do not necessarily imply an underestimation of the true risks, even though this sometimes may be the case. It is also plausible that non-users (or lighter users) hold exaggerated risk perceptions compared to the true magnitude of the risks (see, for instance, Agostinelli & Miller 1994)<sup>1</sup>, which also means that these cannot be used as a benchmark against which the correctness of users' risk perceptions is estimated. For contributions favouring different ways to estimate the correctness of the users' risk perceptions (even if in the area of smoking), see Slovic (2000a; 2000b) and Viscusi (1990; 2000). For an illuminating discussion of different methods of measuring how correct risk perceptions users hold and the disparate conclusions that follow from these, also in the area of smoking, see Weinstein (1998).

The findings suggest that subjective experiences should be addressed in studies exploring the link between drinking patterns and alcohol-related risk perceptions, but more work is needed. More research is particularly needed that focuses on the "remaining" association between behavioural experience and risk perceptions. These studies should employ a panel design, making it possible to more precisely

assess the causal relationship between behavioural experience and risk perceptions. The cross-sectional data used in this study, of course, limits the possibility of drawing conclusions on causality. Further research would probably also benefit from using more fine-grained measures of subjective experiences. It is possible that the measure of subjective experiences in the present study was too crude, which to some extent also may explain the "remaining" differences between different categories of drinkers.

Another limitation is that this study did not explore what kind of consequences underlie the participants' overall evaluation of their experiences of alcohol consumption. As this measure tapped general, subjective experiences (it is not limited to health consequences, for example), different participant may also have thought about different consequences when responding to this question. Further, because individuals' "valuation" of their experiences may vary over time (see note [2]), the results on subjective experiences of drinking in this cross-sectional study should probably only be seen as a "snapshot" at a single time point.

Regarding experienced consequences, recent research among college students shows that commonly reported positive consequences of alcohol pertain to a "fun/social enhancement" dimension, whereas negative consequences to a considerable extent are related to a "personal" dimension (for example, passing out) (Lee et al. 2010). The experience of these consequences in turn affects how students on the whole perceive occasions when they consume alcohol. Students who experience more such specific positive consequences and fewer

negative consequences on a given drinking occasion consider their overall experience of the drinking occasion to be more positive and vice versa (Lee et al. 2010).

The risk perception measure only assessed perceived health risk. Further research should use measures that also capture perceptions of other risks. It should also be noted that the reference points for the three most important variables in the current study (risk perceptions, subjective experiences and drinking habits) are not the same. An optional design would be to use identical reference points for these three measures across both outcomes (for example, risk perceptions pertaining to consumption frequency and subjective experiences of drinking 6 "glasses" of alcohol during one day). Future research should be careful to employ measures with the same reference points in order to reach more certain conclusions. More work is in general needed on how to best measure subjective experiences of drinking and risk perceptions in quantitative studies exploring the relationship between them.

There are some implications of the present results for prevention. Because personal experiences are often seen as having greater informational value than impersonal information (Simonsohn et al. 2008), it may be difficult to affect risk perceptions that are based on personal experiences by simply providing information. The present study indicates that whether people can be assumed to "accept" risk information campaigns is contingent on their subjective experiences of the behaviour in question (in this case alcohol consumption). Hence, in general, information-based prevention initiatives may be more successful among individu-

als whose net experiences are not positive. However, there may still be a place for information/educational efforts on the link between alcohol consumption and negative consequences. If people are unaware of certain negative outcomes, they may fail to recognise that some of their actual, negative experiences are in fact caused by their consumption. They may think that they are caused by something else<sup>5</sup>.

Moreover, this study suggests that prevention could perhaps attempt to make people "reconsider" their subjective experiences of alcohol consumption. Similar conclusions, often recommending that Motivational Interviewing (MI) should play a central role in intervention contexts, have been reached in the literature on consequences of drinking among college students (Kilmer et al. 2007; Lee et al. 2010; Park 2004). Initiatives following this approach could try to make people recall more negative experiences of drinking in order to move people's subjective net experiences in a more negative direction. While this can be challenging outside more demarcated contexts such as schools, there should be gains in addressing a factor that can be assumed theoretically to shape risk perceptions among the general public and where the latter can be difficult to affect by information provision. Further research should explore the "malleability" of people's subjective experiences in order to assess the potential of this approach to changing risk perceptions.

**Declaration of Interest** None.

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## NOTES

- 1 Agostinelli and Miller (1994), for instance, call attention to this possibility by emphasizing the role of what they call "self-enhancement motives" among non-users or lighter users when, for example, providing risk estimates: "by *raising* their judgments of the negative consequences...they can enhance their self-images by proudly viewing themselves as above, or dissociated from, these bad consequences" (328, *italics added*).
- 2 This argument, it should be noted, in its basic form presupposes that there is no systematic difference between user categories in how consequences are valued along a temporal dimension (that is, depending on the time of their realisation). A link between drinking status and "discounting" (or devaluation) of future consequences has been established empirically, where a higher degree of discounting is associated with higher consumption (Rossow 2008). Perhaps even more central than the question of discounting of *future* consequences to the current analysis, however, is whether the valuation of *experienced* consequences is affected by a temporal factor. Ariely and Zauberman (2000, 219) point out that "Almost every daily experience one can think of changes in its intensity over time". Hence, it is possible that the "impact" of experienced alcohol-related consequences on current (or retrospective) judgements of alcohol-related experiences are affected by how far in the past they occurred.
- 3 In this study (Barnett & Breakwell 2001), people's overall evaluation of their subjective experiences (called "outcome", ranging from "very negative" to "very positive", 173) was related to risk perceptions for activities carried out involuntarily but not for activities carried out voluntarily. However, the analyses were based on aggregate measures of each of these two broad categories of activities (each measure was a sum score of eight activities). It is possible that the strength of the association between subjective experiences and risk perceptions vary across specific activities, and the lack of reference point for the ratings (that is, personal or general risk) may also have attenuated the relationship. Participants were instructed to rate "how concerned they were about each hazard" (173), but they were not told whether their judgements should be made in relation to themselves or in relation to people in general. If a non-trivial share of the respondents assumed (which we cannot know) that they should rate the risk in general, such design may be problematic. Theories pertaining to health-related behaviour hold that such beliefs concern the individual him/herself rather than people in general, and "general" beliefs may hence be less pivotal in relation to people's behaviour than "personal" beliefs (Brewer et al. 2007).
- 4 This choice is not the only possible but it was deemed reasonable. Grouping "very great risk" and "quite great risk", for example, would imply that more than half the sample (56.3%) would be included in this category in the first outcome, and more than 8 in 10 (83.3%) would be placed in this category in the second outcome (see Table 1). Additional analysis showed that some cells became small if the outcomes were treated this way. Only 6 individuals in the negative subjective experiences category and only 8 individuals in the category with somewhat more negative experiences responded that the risk of drinking 2 "glasses" of alcohol every day for ten years would pose "quite [a] small risk" or "no risk at all". However, the results from logistic regression with the outcomes treated this way (same independent variables included) revealed significant differences between frequent drinkers (the reference category) and the other categories of drinkers in both outcomes in an expected direction. Also, there were differences between those with positive subjective experiences (the reference category) and the other subjective experiences categories in the expected direction, although the difference between the two "extremes" did not reach significance in the latter outcome (which may be caused by the problem with small cells).
- 5 This important point was raised by one of the anonymous reviewers of this paper.

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