



# Implicit and explicit drinker identities interactively predict in-the-moment alcohol placebo consumption



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## ABSTRACT

**Introduction:** Having an identity as a 'drinker' has been linked to increased alcohol-related harm, self-reported consumption and self-reported intention to engage in risky drinking behavior. These effects have been observed when identities have been measured using explicit measures (e.g. via questionnaires) and implicitly (e.g. using Implicit Association Tests [IATs] adapted to measure identity). Little research has used actual behavioral measures to measure alcohol consumption in-the-moment, nor compared the effects of implicit and explicit identities directly.

**Methods:** Participants' ( $n = 40$ ) implicit and explicit identities associated with being a drinker were measured. Attitudes towards one's own drinking were measured explicitly. Participants completed a Pouring Taste Preference Task [PTPT] involving the consumption and rating of non-alcoholic wine. This provided a behavioral measure of intention (pouring), a behavioral measure of consumption and a measure of the implementation of intention into behavior.

**Results:** Results showed an interactive effect of implicit and explicit identities on attitudes and behavior. Explicit identities predicted attitudes towards drinking, but not behavior. Neither identity predicted the amount poured. Implicit identities predicted the amount consumed. A greater proportion of wine poured was predicted by higher implicit identities when explicit identities were absent.

**Conclusion:** These results suggest that explicit identities may be associated more with those beliefs about drinking that one is aware of than behavioral intention. In addition, explicit identities may not predict behavioral enactment well. Implicit identity shows effects on actual behavior and not behavioral intention. Together this highlights the differential influence of reflective (explicit) and impulsive (implicit) identity in-the-moment behavior.

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## 1. Introduction

Social identities, or those aspects of self-identity tied to the groups we are a part of, (see Tajfel & Turner, 1979) have been highlighted as a pathway into (Dingle, Cruwys, & Frings, 2015) and out of (Best et al., 2015; Frings & Albery, 2015, in press) addictive behaviors. Social identities contain important information for understanding the social world by, for example, providing behavioral norms for adoption and influencing the development and use of attitude and belief sets (see Tajfel, 1978; Tajfel & Turner, 1979). As such the identities we hold should influence all forms of intention formation and subsequent ongoing action. For example, research working within the theory of planned behavior framework has shown that explicitly reported identity as a drinker predicts future intentions to drink above and beyond variance predicted by attitudes, subjective norms and perceived behavioral control (Conner, Warren, Close, & Sparks, 1999). Similarly, identities around student life (being a student or a member of fraternity) are linked with self-

reported frequency of heavier drinking because of the social influence of other group members in the development and use of intragroup consumption norms (Reed, Lange, Ketchie, & Clapp, 2007). Tarrant, Haggart, and Farrow (2012) also discuss work which suggests that making salient a student identity (in contrast to a national identity) was associated with increased intentions to binge drink. Student athletes also appear to be more likely to be risky drinkers to the extent that their social identity facilitates this (Zhou, Heim & Levy, in press). In addition seeing oneself as a 'drinker' may also lead to more positive attitudes to drinking and increased consumption. For example, an analysis of how 17–24 year olds present themselves on social media suggests that displaying alcohol related cues in profiles is common, and that drinking is an important aspect of identity for this group (Ridout, Campbell, & Ellis, 2012). Interviews with young men living in London suggest that drinking plays important part of masculinity, and that this may guide their drinking behavior (De Visser & Smith, 2007). In addition, a stronger identity around being a drinker is associated with the more ready use of alcohol in times of stress (Hershenson, 1965). More recently, Foster, Yeung, and Quist (2014) showed that, amongst US college students, higher levels of drinker identity were linked with increased self-reported alcohol consumption and related problems.

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This evidence is useful to the extent that it provides an account of the importance of identities in the generation of behavior-specific beliefs and intentions as explicitly reported by individuals. More contemporary models argue that this is one part of the cognitive landscape used in behavioral enactment and that we need to consider those processes that act outside of conscious reflection (see Sheeran, Gollwitzer, & Bargh, 2013). In particular, dual process models of alcohol consumption (e.g. Moss & Albery, 2009; Wiers et al., 2010) argue that decisions to drink, and on-going behavior, are influenced by *both* automatic (implicit) and reflective (explicit) cognitions. Automatic cognition is fast and often unconscious and uncontrollable. Reflective cognition is (relatively) slower, often controllable and open to conscious inspection. As social identities are cognitive constructs, it is possible that they can (i) operate at and impact other cognitions and behaviors at both explicit and implicit levels of processing and (ii) there may be a disassociation between these two processes, such that the effects of implicit identities may be more or less influential, and have effects in the same or opposite directions as explicit identities. As drinking is a behavior influenced by habitual processes (Albery, Collins, Moss, Frings, & Spada, 2015) and other automatic processes (Wiers et al., 2010) it is also likely that drinking related identities will have a particularly strong implicit effect on behavior enactment.

Recently, a number of studies have revealed that implicit associations between the self and being a drinker are linked to both higher levels of self-reported past behavior and stronger intentions to drink heavily in the future. Typically these studies use an Implicit Association Test (see Greenwald, McGhee, & Schwartz, 1998) or similar tasks to measure levels of association between the cognitive categories of 'self' and 'drinker'. Stronger associations are thought to be linked to stronger implicit identities. Gray, LaPlante, Bannon, Ambady, and Shaffer (2011) showed that such measures are stable over time (six months sampling period) and have good internal reliability and converging validity with other measures. Importantly, Gray et al. (2011) also showed that alcohol related identities predict self-reported risky drinking behaviors. Similarly, Lindgren, Neighbours et al. (2013) showed that their Drinking Identity IAT can predict alcohol consumption, alcohol related problems and alcohol craving. Lindgren, Foster et al. (2013) also employed this method and observed that having an implicit drinking identity predicted self-reported alcohol consumption and alcohol related harms to a greater extent than implicit approach/avoid attitudes to alcohol. Implicit drinker identity also appears to mediate the relationship between drinking motives (around coping, enhancement and social goals) and self-reported consumption and craving (Lindgren, Neighbors, Wiers, Gasser, & Teachman, 2015). These effects do not seem to be moderated by other individual differences (e.g. habit) which predict consumption (Lindgren, Neighbours et al., 2013). Not all evidence has shown such strong effects: Caudwell and Hagger (2014) showed that positive implicit alcohol identity linked to self-reported alcohol related harm, but found only a significantly marginal link to self-reported typical alcohol consumption. The current study adopts a dual process account of identities (see Frings & Albery, 2015, *in press*) to explore the effects of identities (reported both explicitly and implicitly) on actual drinking behavior.

As one would expect from an emerging area of study, the extant literature has both theoretical and methodological limitations. From a methodological point of view, existing alcohol consumption studies have relied on self-report measures of retrospective consumption patterns. This is problematic to the extent that people are poor judges of how much they have consumed in the past (see Bellis, Hughs, Cook, & Morleo, 2009) and that their intentions to drink (particularly in moderation) may not predict future behaviors. Alongside this, admissions of heavy drinking may be either seen as desirable or undesirable amongst participants leading to presentation biases. As a result, there is an increasing use of measures of actual drinking behaviors to corroborate the results of retrospective and intentional designs. One way of achieving this without the administration of actual alcohol is to use a *Taste-Preference Task* [TPT, see Morrison, Noel, & Ogle, 2012] or the more recently developed *Pouring Taste Preference Task* [PTPT, Albery et al., 2015].

The TPT and PTPT measure 'in-the-moment' drinking behavior. In the TPT participants are given a set volume of realistic wine or beer substitutes (in reality, a placebo) to consume over a set time period, purportedly to allow them to rate the drinks on taste/quality, etc. At the end of the study the remaining fluid is measured, allowing a calculation of consumption. The PTPT adds an additional step. Participants pour their own drinks from a known volume, allowing the calculation of the amount poured, the amount consumed, and the proportion of the amount poured consumed. This allows the differentiation of behavioral intention (pouring), behavior (drinking) and the intention-behavior link (proportion consumed). These measures have been used variously by multiple research labs, probe debriefing suggests that they possess a good level of plausibility amongst participants and they appear to be sensitive to both contextual and individual differences (e.g. Albery et al., 2015; Frings, Albery, Rolph, Leczfalvy & Moss, *under review*; Morrison et al., 2012; Moss et al., 2015). In the present study, the PTPT was employed as a direct measure of consumption.

From a conceptual perspective, one issue is that the majority of existing studies measure identities either explicitly or implicitly. Directly comparing the influence of these two identities is important, as without understanding the relative influence of each process, it is hard to draw conclusions around mechanisms for their relative operation. It is possible that the effects of implicit and explicit identities are dissociated which would have important implications for understanding alcohol consumption as a behavior. Such disassociation can only be identified if both constructs are measured simultaneously. One study which informs this question is Lindgren, Neighbours et al. (2013) which measured both implicit and explicit identities as a drinker, and observed both to be positive and unique predictors of self-reported drinking. However, little other work directly addresses this issue, and none to the authors' knowledge using actual behavioral measures of drinking. The current study aimed to expand this literature by simultaneously measuring drinker identities, and linking them with in-the-moment consumption.

In summary, the current experiment examined the effects of implicit and explicit drinker identities on in-the-moment alcohol consumption intentions and actual consumption, and how these identities relate to explicit attitudes towards drinking. As alcohol consumption has many features which make it a more automated, as opposed to reflective, behavior, we expect in-the-moment drinking behavior to be more strongly influenced by implicit rather than explicit drinking identities. In contrast, the generation of explicit attitudes about one's own behavior is a conscious, reflective process. As such, attitudes about one's own drinking should be influenced more strongly by explicit identity processes than implicit ones.

## 2. Methodology

### 2.1. Participants

Forty participants (32 females and 8 males) were recruited from an undergraduate population. Their ages ranged from 18 to 41 years ( $M = 24.60$ ,  $SD = 4.90$ ). All participants were over 18 and all reported that they drank alcohol.

### 2.2. Design

A correlational design was used. Measures comprised levels of explicit and implicit and levels of drinker identity, and amount of placebo alcohol poured, drank and the proportion drank, measured via the *Pouring Taste Preference Task*.<sup>1</sup>

<sup>1</sup> In addition, participants either conducted the study in a traditional laboratory or bar laboratory (see Moss et al., 2015 for details of the setting). Subsequent t-tests revealed no differences in any dependent variables due to context ( $ps > .17$ ) and including context as a covariate made no difference to pattern of results presented below (see Footnote 2).

## 2.3. Materials

### 2.3.1. Explicit drinker identity

Five items were used to measure explicit levels of identification with being a drinker. These comprised the following items 'I am proud to be a drinker' (drawn from Sellers, Rowley, Chavous, Shelton, & Smith, 1997), 'I am similar to other people who drink' (adapted from Spears, Doosje, & Ellemers, 1997), 'I feel like I am a member of a group of drinkers', 'I have things in common with people who drink' (both adapted from Spears et al., 1997) and 'I am a drinker'. These were presented on seven point Likert scales (1 = *Strongly disagree*, 7 = *Strongly agree*). Cronbachs  $\alpha$  was .82 and a mean scale score was calculated such that higher scores indicate higher levels of identity.

### 2.3.2. Explicit attitudes towards own drinking

Seven items were used to measure participant's explicit attitudes towards their own drinking behavior. These consisted of the following items: 'I feel good about my drinking', 'I like to drink', 'I do not like to drink', 'I do not feel good about my drinking', 'I sometimes regret drinking', 'I find drinking relaxing', 'I enjoy drinking'. These were also presented on seven point Likert scales (1 = *Strongly disagree*, 7 = *Strongly agree*). Negatively framed items were reversed scored. Cronbachs  $\alpha$  was .74 and an aggregate scale was calculated such that higher scores indicate positive attitudes towards drinking.

### 2.3.3. Implicit drinker identity

A drinker Implicit Association Test (IAT) was used to measure implicit levels of drinker identity using stimuli generated by Lindgren and colleagues (Lindgren, Foster, et al. 2013; Lindgren, Neighbors, et al. 2013). This measured alcohol-related memory associations. Participants were asked to assign words to categories, with the letter 'E' representing categories on the left and the letter 'I' for categories on the right. The categories (and associated stimuli) were either 'Me' (Me, My, Mine, Self) or 'Not me' (They, Them, Theirs, Other) and 'Drinker' (Drinker, Partier, Drunk, Drink) or 'Non-drinker' (Non-drinker, Abstainer, Sober, Abstain). The presentation rate for the stimuli was 700 ms, in Arial font, size 22, in black on a white background. An initial block of 80 trials trained participants to correctly identify the 'me' and 'not me' words ( $n = 40$  trials) and 'drinker' vs 'non-drinker' words ( $n = 40$  trials). Two blocks were then presented. Block A (80 trials) paired drinker/me and not drinker/not me categories, Block B (80 trials) reversed the pairings (e.g. drinker/not me). The order in which Blocks A and B were presented were counterbalanced between participants.

Between each trial a fixation point was presented where the stimuli would subsequently appear for 250 ms. To look at levels of association between the cognitive categories of self and drinker reaction times to correctly answered trials in which self and drinker were paired on the same response key was subtracted from correctly answered instances where self and non-drinker were paired on the same response key. Following Nosek, Greenwald, and Banaji (2007) participants who had more than 10% of trials with a response time of <300 ms ( $n = 1$ ), or those who had a greater than 30% error rate ( $n = 5$ , including the participant with erroneous response times) were screened out prior to calculation of IAT scores. Using guidelines from Greenwald, Nosek, & Banaji, 2003, these scores were divided by the pooled standard deviation of all trials in Blocks A and B to calculate a D score. Higher difference scores indicate a longer latency in drinker-not me trials than drinker-me trials (i.e. a stronger cognitive association between 'self' and 'drinker' than between 'self' and 'non-drinker').

### 2.3.4. Pouring Taste Preference Task (PTPT)

A Pouring Taste Preference Task was employed to measure drinking behavior. Participants were presented with a bottle of red wine and a bottle of white wine (both in reality containing non-alcoholic wine). At the start of each participant's testing, each bottle and its initial level of fluid weighed 1025 g (and was filled to the top of the label on the

**Table 1**

Mean scores (standard deviation and in parentheses) and Pearson's  $r$  correlation between measures.

Variable	Mean (SD)	(2)	(3)	(4)	(5)	(6)
(1) Explicit identity	4.01 (1.33)	-.069	.56**	-.10	-.20	-.24
(2) Implicit identity	-0.08 (.67)	-	-.16	.08	.33†	.28
(3) Explicit attitude towards drinking	5.20 (.87)		-	-.23	-.16	-.07
(4) Total poured (ml)	85.16 (35.66)			-	.41*	-.04
(5) Total drank (ml)	27.59 (29.74)				-	.82**
(6) Proportion drank	0.33 (.30)					-

Note:  $N = 32$ . \*  $p < .05$ , \*\*  $p < .01$ , †  $p < .07$ .  $N = 32$  for all correlations.

main body of the bottle). Participants were also given a rating sheet (asking them to pour as much or as little of the wine as they liked, and to rate the wines on dimensions such as taste, quality, possible cost). Participants informed that they were to be given 10 min to complete this task, and that the drinks contained alcohol. Once participants had completed this task the bottle and glasses were placed to one side and, once the participant had concluded the study and left the lab. At this point both vessels were weighed to determine the total wine poured and subsequently drank. From this, the proportion of poured wine drank was calculated.

## 2.4. Procedure

Once informed consent was gained, participants completed the identity IAT, explicit measures of identity and attitude (these items were ordered randomly together in the study design phase and presented in this order to all participants) and finally undertook the PTPT. After the PTPT they are asked some funnel debriefing questions (see Bargh & Chartrand, 2000) to probe awareness of the studies purpose or use of a placebo. These consisted of asking the participants what the study was about, and whether they had any suspicions regarding the study. No participants were excluded on this basis. Finally, participants were given a full debriefing and thanked for their participation.

## 3. Results

Three participants had IAT-D scores which fell over two standard deviations from the mean and were excluded from subsequent analysis. Mean scores and Pearson's  $r$  coefficients for the intercorrelations for all variables can be seen in Table 1.

Explicit levels of identity as a drinker were unrelated to implicit levels or any PTPT measures. Explicit levels of identity did, however, positively relate to attitude towards drinking. Implicit levels as a drinker positively related to total drank with one tailed statistical significance ( $p = 0.07$ ). Total poured was positively related to total drank, but not proportion drank. The proportion of wine poured that was drunk was also positively related to total drank.

### 3.1. Regressions

To test the relative effects of implicit and explicit drinker identities on attitudes to own drinking and also behavior during the PTPT, a number of regressions were undertaken.<sup>2</sup> For each regression, implicit and explicit levels of identity were included as predictors in the first step of the regression. The interaction term between the two was also calculated, and included in the second step. This model was used to predict variance in participants' attitude to their own drinking, the amount of

<sup>2</sup> Additional analysis were undertaken to check whether context (bar or barlab) influenced the analysis as a single predictor or interactively with the other variables. No significant effects were found. All variables were normally distributed with the exception of total drank, which had a moderate positive skew (Skewness = 1.78, SE = .41).



**Table 2**  
The relationships between implicit and explicit identities on drinker attitude and PTP outcomes.

Criterion variable	Regression model fit				Explicit identity			Implicit identity			Interaction		
	R <sup>2</sup>	$\bar{R}^2$	F	p	$\beta$	t	p	$\beta$	t	p	$\beta$	t	p
Drinker attitude	.32	.28	4.48	.011	.55	3.58	.001	-.12	.79	.44	-.017	-.03	.97
Total poured	.04	-.06	0.41	.747	-.09	.49	.627	.07	.39	.69	.55	.90	.37
Total drank	.16	.07	1.74	.182	-.18	1.04	.305	.31	1.82	.079	-.44	-.77	.446
Proportion drank	.30	.23	4.04	.017	-.22	1.27	.213	.27	1.54	.134	-1.38	2.63	.014

Note: Models are reported by row, with the dependent (criterion) variable in the first column, followed by model fit statistics, the effects of each identity as a predictor variable, and the resulting interaction term. Model fit statistics reflect the full model with both predictors and interaction term. For all models, N = 32 and degrees of freedom were (3,28). R<sup>2</sup> indicates adjusted R<sup>2</sup>.  $\beta$  indicates standardised betas.

wine poured, the amount of wine drank, and the proportion of the wine pour by including each singly as the criterion variables (in separate regression models, see Table 2).

In summary, participants' attitude towards their own drinking was related to their explicit identity as a drinker (with greater identification being related to more positive attitudes), but not their implicit identity as a drinker. The amount participants poured was unrelated to the either identity. There was a marginal ( $p = .079$ ) association between implicit identities and total consumed. There was no relationship ( $p = .31$ ) between this outcome and explicit identity. The proportion of the amount poured consumed was predicted by a significant interaction between the two identities. To explore this interaction via simple slopes analysis, both identity variables were standardised, a new interaction term calculated and simple slopes analysis was undertaken, testing at values  $\pm$  one standard deviation from the mean (see Fig. 1). When levels of explicit identity were high, there was no effect of implicit identity,  $\beta = -.06$ ,  $t(32) = .73$ ,  $p = .47$ . When levels of explicit identity were low, higher implicit identity was linked to a greater proportion consumed,  $\beta = .22$ ,  $t(32) = 3.03$ ,  $p < .001$ . When levels of implicit identity were low, there was no effect of explicit identity,  $\beta = .07$ ,  $t(32) = 1.09$ ,  $p = .29$ . When levels of implicit identity were high, lower levels of explicit identity were linked with a greater proportion consumed,  $\beta = .21$ ,  $t(32) = 2.81$ ,  $p = .009$ .

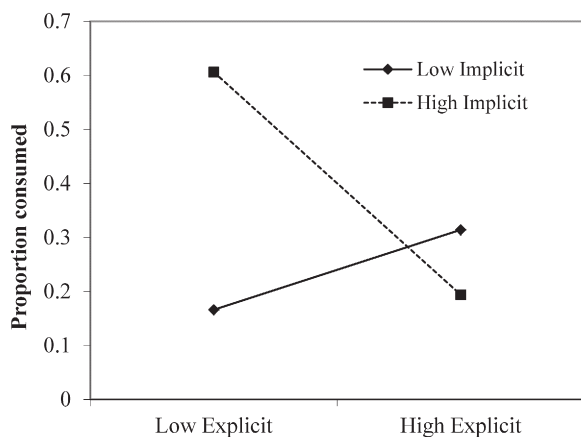
#### 4. Discussion

The current study aimed to test the effects of having explicit and implicit identities as a drinker upon in-the-moment drinking behavior. The results suggest that explicit identities as a drinker relate to explicitly reported attitudes towards one's own drinking. Neither identity predicted behavioral intention (i.e. how much people poured). However, the proportion of the amount poured (which represents the behavior-

intention enactment link) and the total amount consumed (i.e. actual behavior) were both predicted by identity measures. A trend in the data was observed such that higher levels of implicit (but not explicit) identity as a drinker predicted higher levels of actual consumption. No suggestion of such relationship was observed for explicit behaviors. Unexpectedly, an interactive effect of these two identities was observed to predict the proportion of the amount poured which was actually consumed. Specifically, participants in our study who explicitly reported low levels of identification towards the social category 'drinker', but also showed a high implicit association between self and this category consumed the highest proportion of the alcohol poured. In other words, in enacting the behavioral intention to drink alcohol there appears to be no dissociable relationship between reporting increased explicit awareness of one's personal identity as a drinker and one's implicit identity as a drinker. Conversely, amongst those who report decreased identity as a drinker it appears that translating one's intention into ongoing behavior is dependent on one's implicit identity as a drinker. For these individuals the translation of intention into behavior is best predicted by an increased implicit associative pattern for the self as a drinker. That the implementation of intentions into behavior can be characterised as a more automated processes has been previously established (see e.g. Bargh, 1992; Gollwitzer, 2014). Our findings, however, directly suggest that in understanding the role of identity in translating intention into behavior we need to assess covariation between those concepts of the self as a drinker of which we are not aware but particularly amongst those with decreased self-reports for themselves as being a drinker. This need to consider the interactive effects of different cognitive systems for health and non-health behaviors is characteristic of all dual processes approaches (e.g. Wiers et al., 2010; Strack & Deutsch, 2004).

These findings replicate and expand on current research which link implicit identities to both alcohol related harms and self-reported previous consumption (e.g. Caudwell & Hagger, 2014; Gray et al., 2011; Lindgren et al., 2015; Lindgren, Foster et al., 2013; Lingren, Neighbours et al., 2013). It also expands the range of samples which have been included in this body of research to include UK as well as US student populations. This is important as UK students, who can drink legally, are more likely to have been drunk at an earlier age, and for whom drinking may be more normalised may have different contents to their identities, and such could have differing identity-behavior links.

In contrast, neither zero order correlations nor our regression analysis linked explicitly reported identities to actual drinking behavior. Why may the current studies have not replicated existing findings showing explicit identities that predict alcohol related harms and use? One explanation of this effect is that whilst explicit identities predict behavior over a long period of time (e.g. average behaviors), they are not sensitive in the shorter term for immediate behavioral enactment. Alternatively, in terms of retrospective measures, thinking about oneself as a 'drinker' may also affect recall of related prior experiences (e.g. alcohol related harms). For instance, if people with a stronger identity are more affected by this bias, they would also report higher consumption. Alternatively, people who explicitly identify more highly with being a drinker may also be more motivated to report increased consumption



Note: Values are at plotted at  $\pm$  1SD from the mean.

**Fig. 1.** Effects of implicit and explicit identities on proportion consumed. Note: Values are plotted at  $\pm$  1SD from the mean.

and harms (especially if this is seen as socially normative). Future research could explore these issues by comparing data from real-time consumption (for instance, collected via smartphone app) with self-report, and testing for a relationship between levels explicit drinker and degrees of disparity between outcome measures. What the current study does suggest, however, is that for the prediction of immediate behaviors, levels of active implicit identity are a more accurate predictor than explicit identity. This may well reflect drinking as a behavior with more habitual components (see Albery et al., 2015). In line with dual process accounts of cognition in health and social behaviors (see Sheeran et al., 2013; Strack & Deutsch, 2004; Wiers et al., 2010), this work supports the idea that one mechanism through which the goal to drink (intention) results in behavior to fulfill this goal may comprise active and accessible beliefs about the 'self' related to drinking which operate predominantly outside of one's immediate conscious awareness. The importance of the current work is to show that these implicit beliefs include those related to one's identity per se (see Frings & Albery, 2015, in press) and that these beliefs predict behavior prospectively.

One interesting finding of the current study was that implicit and explicit levels of identity were unrelated. This is in contrast to other work which shows positive correlations between the two (e.g. Lindgren, Foster et al., 2013). This could be due to the relatively moderate levels of explicit identification with being a drinker observed in the current study (with the mean around the mid-point of the scale) as opposed to lower levels observed in other studies (such as Lindgren, Foster et al., noting these use very different instruments). One possibility is that the relationship between explicit and implicit drinker identities may vary as a function of levels of explicit identity. Indeed, as implicit measures are relatively uncontrollable, it may be the case that explicit measures are either highly prone to self-presentation biases (intentionally or not), or that they are malleable such that the presence of alcohol related cues (e.g. a PTPT) shifts them immediately prior to action (e.g. if we measured identity *during* as opposed to *prior* to the drinking episode a different pattern of results would be observed). Future work could perhaps disentangle these explanations by looking at the relationship between social desirability and the extent of implicit and explicit identity disparity. It could also compare the link between implicit and explicit identities when levels of the latter are higher or lower. Whichever process is in operation the current research shows that a disassociation is present – explicit identity affected attitudes but not behavior, whilst implicit identity predicted behavior but not attitudes. This finding represents an important theoretical advance in that it suggests that exploring identity effects requires an understanding of *both* their explicit and implicit contents. It also suggests that actual behaviors may be better predicted by implicit measures such as drinker IATs.

One limitation of this (and other) research on the links between identity and alcohol consumption is that it focuses on younger drinkers, and almost exclusively upon student populations. Whilst this is entirely defensible in that (i) these groups contain many high risk drinkers and (ii) basic cognitive processes should not vary between populations, it also presents some issues of generalisability. In particular, the *content* of identities associated with drinking (including the association they have with behavioral outcomes) may vary. In support of this, Wilson et al. (2013) observed that amongst older participants, being seen as a 'drinker' was a less desirable identity (although heavy drinking was still perceived as highly prevalent). Specifically to the current study, male participants were under-represented. This presents an avenue for further work – it is possible that men may drink more than women, may be more or less open about their drinker identities and their attitudes towards alcohol. These effects could, for example, be an additional factor which changes the nature of the relationship between implicit and explicit identities.

The PTPT task is relatively novel, and advantageous in its ease of use and low pharmacological impact. However, it shares with other in-the-moment measures (including alcohol consumption tasks) a number of limitations. For instance, participants may drink differentially due to

levels of thirst, mood, later commitments in the day, and if they prefer the chosen drink more or less. For this latter factor, possible improvements to the paradigm could include offering beer or wine (and calculating hypothetical units consumed) or pre-screening participants according to preference. Specifically to the PTPT, it may be possible that participants may in fact have suspected that a placebo design was being used. Although our probe debriefing did not reveal such effects in this study, other work from our own laboratory and that of others shows detection rates of between 5 and 20%. In the current study, these low detection rates may be a function of chance (particularly with our modest sample size) or due to the additional cues present (i.e. for those participants undertaking the study in the bar–lab context).

Targeting identities has been postulated as be an avenue for intervention amongst risky/problem drinkers. Amongst alcoholics and those with other addictions (e.g. smoking), the importance of social identity in maintaining cessation is increasingly recognised (see Frings and Albery, 2015, in press, for an overview). For instance, Buckingham, Frings, and Albery (2013) showed that for those who are recovering from alcoholism a strong preference for 'recovery' based identities over 'using' ones is linked to reduced lapse rates. Similarly, activating more health orientated identities over less health orientated ones has been shown to reduce drinking intention (see Tarrant et al., 2012). The current research suggests that such interventions may be particularly (or, perhaps only) effective when changes in identity are achieved at an implicit level. In particular, having an explicit identity as a non-drinker may affect intentions and 'average' long term outcomes. However, resilience to in-the-moment behaviors (e.g. 'accepting an offered drink') may only grow to the extent that changes in implicit identity are achieved. In situations where single lapses are highly costly, such resilience may be of particular importance.

In summary, the current study shows that implicit identities as a drinker predict actual in-the-moment levels of consumption amongst drinkers who do not explicitly identify themselves highly as social drinkers. Explicit identities predict explicit attitudes whereas implicit identities did not. This suggests that implicit measures may at times be more suitable for predicting in-the-moment behaviors. Moreover, it is suggested that interventions aiming to increase controls over such behaviors may need to affect implicit identities to be effective.

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#### Role of authors

Frings directed the research and wrote up the first draft of manuscript for publications. Melichar assisted with the design of the project, collected the data and assisted with analysis. Albery was involved in the design, analysis and draft revisions. All authors have contributed to and have approved the final manuscript.

#### Conflict of interest

No authors have conflicts of interest to declare.

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