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**A Volitional Help Sheet to Reduce Binge Drinking in Students:
A Randomized Exploratory Trial**

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Aims

This study tested the ability of a volitional help sheet (VHS) to decrease binge drinking in UK students.

Methods

Fifty-six participants were randomly allocated to one of three conditions: *control*, *active control* or *VHS* as part of a questionnaire-based study.

Results

There were significant decreases in units of alcohol consumed and self-reported binge drinking frequency in the *VHS* condition, but not in either of the control conditions.

Conclusions

The findings support use of the VHS to help people to reduce their alcohol consumption and binge drinking.

A Volitional Help Sheet to Reduce Binge Drinking in Students:

A Randomized Exploratory Trial

Alcohol-related morbidity and mortality is an increasing problem across the UK, particularly among young people (16-24 years) with 25% of young women and 32% of young men binge drinking at least once a week (Health and Social Care Information Centre, 2009). Despite government campaigns designed to reduce harmful drinking (Alcohol Harm Reduction Strategy, 2004), the prevalence of harmful drinking continues to be a concern. The principal aim of the present study was to test a tool (the volitional help sheet) designed to facilitate the formation of implementation intentions (Gollwitzer, 1999) to reduce binge drinking in young people.

Implementation intentions are if-then plans that link in memory a critical situation with an appropriate behavioural response. When the critical situation is encountered, the linked behavioural response is activated automatically (Gollwitzer & Sheeran, 2006). Implementation intentions have been shown to be an effective means of changing behaviour, with an average effect size of $d = .65$ reported in Gollwitzer and Sheeran's (2006) meta-analysis. Although only 1 of the 94 studies reported in Gollwitzer and Sheeran's (2006) meta-analysis investigated alcohol consumption (Murgraff et al., 1996), implementation intentions have successfully reduced alcohol consumption in four more recent studies (Murgraff et al., 2007; Gebhardt et al., 2008; Armitage, 2009; Armitage, Harris and Arden, 2011).

The volitional help sheet (VHS; Armitage, 2008) is a tool designed to enable the construction of effective implementation intentions in which participants are asked to link in memory temptations (difficult situations that result in urges to engage in a specific behaviour) or "critical situations" with processes of change (means by which behaviour is changed/sustained or "appropriate behavioural responses") from the transtheoretical model

(Prochaska & DiClemente, 1983). Armitage (2008) tested the ability of a VHS to encourage quitting in a sample representative of smokers. The results showed that significantly more people quit in the experimental group ($p < 0.01$, 19%, $n = 9$) when they were asked to form implementation intentions by linking critical situations (e.g. "If I am tempted to smoke at a bar or pub while having a drink" adapted from Velicer et al., 1990) with appropriate behavioural responses (e.g. "then I will remember that I get upset when I think about my smoking" adapted from Prochaska et al., 1988) compared with the equivalently active control group (2%, $n = 1$), who were asked simply to identify critical situations and appropriate behavioural responses that might be useful to them without linking them together in memory.

No studies to date have utilized a VHS in relation to binge drinking, although evidence-based drinking temptation scales and processes of change for drinking scales exist that could be used to create a binge drinking volitional help sheet. A binge drinking VHS could be a very simple, cost-effective and easy to use intervention to reduce drinking because VHSs are self-directed and take fewer than five minutes to complete. Therefore, the present study aimed to pilot an alcohol-reduction VHS in a population at risk of high levels of binge drinking. It was hypothesised that: (a) planning to reduce binge drinking using the VHS (linking critical situations and appropriate behavioural responses in a *VHS condition*) would reduce binge drinking over and above being asked simply to form a plan (*control condition*) or being asked to tick critical situations and solutions (*active control condition*), and (b) there will be no difference between being asked to form a plan (*control condition*) and being asked to tick critical situations and solutions (*active control condition*).

Method

Design

A randomized controlled design with one between-subjects factor and one-within subjects factor was used. The between-subjects factor was condition, which had three levels: *control*, *active control* and *VHS* condition. The within-subjects factor was time with all measures being taken at baseline and follow-up. The dependent variables were weekly alcohol intake in UK Units (a UK “Unit” is defined as 8 grams/10ml of alcohol, which is equivalent to half a pint/284ml of ordinary strength (3.5% abv) beer, a 125ml glass of wine at 9% abv strength or one measure/25ml of (40% abv strength) spirits and binge drinking frequency.

Participants

Participants were students recruited via advertisements (for a study about binge drinking) and opportunity sampling (e.g. in lectures) on a UK University campus, meaning it was not possible to collect data on the number of participants who were approached and eligible to take part but who declined. Potential participants were approached and screened to ensure that they were over 18 and had drunk alcohol within the last month. They were then asked to take part in a study about binge drinking and asked if they would be willing to complete a further questionnaire in two weeks time. The University ethics committee gave approval for the study and all participants gave informed consent to take part in the study and were made aware of their right to withdraw.

All fifty-six participants completed both baseline and follow-up questionnaires: 17 in the *control* condition, 18 in the *active control* condition, and 21 in the *VHS* condition. Their ages ranged from 18 to 28 years ($M = 20.57$ years, $SD = 1.90$). Thirty-seven (66.1%) were women.

Procedure

Once participants had been recruited to the study they were given a baseline questionnaire and left alone to complete it. On completion the participant returned it to the experimenter and an appointment was made to meet in 2 weeks time to complete the second questionnaire. Personal contact details were kept separate from the questionnaires. Baseline and follow-up questionnaires were matched on the basis of self-generated personal codes.

Measures

Alcohol consumption. Participants were asked to describe the types and number of alcoholic drinks that they consumed in 'an average week' (baseline) and 'last week' (follow-up). Each day of the week was presented on a separate line with space given alongside to write a description of the type of drink and the size of the glass or bottle. These descriptions were then converted into units of alcohol for analysis. This method has been utilized successfully in previous research (e.g., Armitage, 2009; Armitage et al., 2011; Sobell & Sobell, 1992) and similar self-report instruments have been shown to agree 97.1% with biological measures (Babor et al., 2000).

Binge drinking frequency. Participants were asked "How often did you binge drink in the last 2 weeks?", which was answered on a 7-point (+1 to +7) scale with the endpoints *never* and *frequently*. Binge drinking was defined as females drinking more than 3 units of alcohol in one session, or males drinking more than 4 units in one session. This definition was deliberately broad to enable all types of potentially hazardous drinking to be considered, and is consistent with the wide variations in definition of the term 'binge drinking' used by young people (Cooke, French & Sniehotta, 2010).

Manipulations

In addition to completing the measures above participants were randomized to one of three conditions: *control*, *active control* or *VHS*. After completing the baseline questionnaire,

participants in all conditions read the statement: "I would like you to plan to avoid binge drinking in the **next two weeks.**" Participants in the *control condition* then read a second statement, which said: "You may do this in whatever way you wish. You may use the space below to make a plan."

Participants randomized to the *active control condition* were additionally presented with the following instructions: "On the following page is a list of situations in which binge drinking may occur. There is also a list of solutions that could be used to avoid binge drinking taking place in these situations. You should use these to plan how you will behave in situations in which you would normally engage in binge drinking. Please read and then tick all statements you feel are relevant to you. Then use these to assist you in avoiding binge drinking." The next page contained a list (on the left hand side of the page) of 20 situations, which were adapted from the binge drinking temptation scale (Maddock et al., 1999) to form critical situation statements (see Table I for a list of the *Situation* statements). Each critical situation was accompanied by a tick box. On the right hand-side of the page were 20 possible solutions: Two for each of the ten of processes of change (Prochaska & DiClemente, 1983). These were selected from the alcohol processes of change (Cancer Prevention Research Center, 2010) and adapted to form appropriate behavioural responses (see Table I for a list of the *Solution* statements). Each appropriate behavioural solution was accompanied by a tick box.

Participants randomized to the *VHS* condition were provided with the same instructions and the same lists of situations and solutions as the active control condition (see Table I). In addition they were instructed: "You now need to match up situations you have ticked with a solution you have ticked by drawing a line connecting the two. You can match any up in any order; whichever way you think will work best for you. It is important you make a clear link between each set of statements that you choose, i.e., it is important to link

each situation with the solution you choose to go with it to form one statement." An example of a linked statement in relation to smoking behaviour was presented in order to further clarify the instructions.

Results

MANOVA was used to test whether randomization had been successful. Condition was the independent variable and age, baseline units of alcohol, and baseline binge drinking were the dependent variables. Neither the multivariate nor any of the univariate tests were statistically significant, $F_s(2,53) = 0.11-0.62$, $p_s > .54$, η_p^2 's $< .01$. There was no difference in the proportion of men and women in the three conditions either, $\chi^2(2) = 1.31$, $p = .52$.

The effect of condition on alcohol consumption was tested using a one-way ANCOVA with units of alcohol per week at follow-up as the dependent variable, condition as the independent variable and units of alcohol per week at baseline as the covariate (Table 1). There was a significant effect of condition, $F(2,52) = 3.75$, $p = 0.03$, $\eta_p^2 = 0.13$, and pairwise comparisons indicated that participants in the *VHS condition* reported drinking significantly ($p = .01$) fewer units at follow-up, controlling for baseline, than the *control condition*, and a trend toward significantly fewer units ($p = .08$) than the *active control condition* (Table II)ⁱ.

A one-way ANCOVA tested the effects of the intervention on the frequency of self-reported binge drinking at follow-up with baseline frequency of binge drinking as the covariate, and condition as the independent factor. Consistent with the reductions in alcohol consumption, this revealed a significant effect of condition, $F(2, 52) = 4.11$, $p = .02$, $\eta_p^2 = .14$. Pairwise comparisons indicated that participants in the *VHS condition* reported binge drinking on significantly fewer occasions than both control and active control conditions ($p = .01$ and $p = .03$, respectively, see Table II for adjusted means)ⁱⁱ. Overall, episodes of self-reported binge drinking decreased by 39.5% over the course of the study in the *VHS* group.

Discussion

This is the first study to have looked at the utility of a VHS to reduce binge drinking. Implementation intentions formed by linking temptations with processes of change in a VHS resulted in significant decreases in both weekly alcohol consumption and frequency of self-reported binge drinking compared to planning to reduce binge drinking and listing (but not linking) temptations and processes of change.

The VHS appeared to provide a useful structure to assist participants in creating effective implementation intentions. This is consistent with a growing body of research showing the success of the VHS in other domains (Armitage, 2008; Armitage & Arden, 2010). Further research is now needed to ascertain which pairings of temptations and processes of change are most effective, the optimal number of implementation intentions that should be made using the approach, and the extent to which these findings are generalizable within the domain of alcohol-use, and to other health behaviour domains.

The binge drinking VHS used in this study caused an average decrease of more than seven units of alcohol per week compared to controls. This compares very favourably with Armitage (2009) who reported a 3.5 unit per week decrease for people who were asked to form their own implementation intentions. This suggests that a structured implementation intention intervention may be more effective than a self-generated implementation intention. This may be because the VHS provides useful direction about likely temptations to drink and effective behavioural solutions that participants may not have the insight to generate independently. Before an individual has attempted to reduce binge drinking they may not have experienced or reflected on the likely temptations and how they might avoid them. Further research should therefore compare directly the utility of the VHS with self-generated implementation intentions.

Although the present findings seem to support the use of VHSs, it is important to acknowledge some limitations of the research that could be addressed in future research. First, being an exploratory study, we utilized a relatively small sample and short follow-up period of 2 weeks. While future research needs to examine whether these effects can be sustained over a longer period of time, the magnitude of the effect found in this study (>7 unit weekly reduction compared to controls) is promising given that research has found that greater initial changes in health behaviour are associated with larger improvements in ongoing behaviour change (e.g. Jeffery et al., 1998). In addition the effects of implementation intentions have been found to persist over a 6 month period in the domain of physical activity (Luszczynska, 2006). Second, the study could have measured intentions to binge drink alongside binge drinking behaviour. Although implementation intentions have not been found to affect intentions (Armitage, 2009) due to their automatic action (Gollwitzer & Sheeran, 2006), their effects are more potent in those with stronger intentions to engage in the behaviour (Armitage & Arden, 2008) and a measure of binge drinking intention may have allowed us to test this possibility.

A third limitation was that the binge drinking frequency measure was on a 7-point scale in order to make it consistent with the other measures in the questionnaire. However, it is possible that measuring binge drinking frequency in numerical terms (0-14) might have been more sensitive to changes in behaviour. Nevertheless, our measure was sufficiently sensitive to detect a significant effect. Fourth, because there are wide variations in the use of the term 'binge drinking' by young people (Cooke et al., 2010), it is possible that definitions of binge drinking may have varied between individuals. However, the fact that the VHS also significantly reduced the number of Units people drank suggests a genuine decrease in the number of binge drinking episodes.

In conclusion, the present research study demonstrated the effectiveness of a structured implementation intention intervention to reduce binge drinking. The VHS intervention that required participants to link temptations (critical situations) with processes of change (behavioural responses) produced significant decreases in weekly alcohol consumption and frequency of self-reported binge drinking. Although the study was small and over a short time frame, these findings suggest that the VHS may provide a simple and effective intervention that could be generalized to broader samples and to other health behaviours. Future research is needed to establish the best protocol for the delivery of the VHS intervention and the extent to which the behavioural changes are long-lasting.

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Table I: Situations (adapted from Maddock et al., 1999) and Solutions (adapted from Cancer Prevention Research Center (2010) from the binge drinking VHS and active control task

<i>Situations</i>	<i>Solutions</i>
If I am tempted to binge drink when I am excited	then I will avoid situations that encourage me to drink
If I am tempted to binge drink when I am with others who are drinking a lot	then I will use reminders to help me not to drink
If I am tempted to binge drink when things are not going my way and I am frustrated	then I will do something nice for myself for making efforts to change
If I am tempted to binge drink when I am really happy	then I will reward myself when I don't give into my urge to drink
If I am tempted to binge drink when my friends push me to keep up with their drinking	then I will then I will calm myself then I will do something else instead of drinking
If I am tempted to binge drink when I am feeling depressed	then I will seek out someone who listens when I want to talk about my drinking
If I am tempted to binge drink when I am having fun with friends	then I will notice signs in public places trying to help people not to drink
If I am tempted to binge drink when other people encourage me to have a drink	then I will seek out social situations where people respect the rights of others not to drink
If I am tempted to binge drink when I am very anxious and stressed	then I will stop to think about how my drinking is hurting people around me
If I am tempted to binge drink when offered a drink by someone	then I will remember that I have strong feelings about how much my drinking has hurt the people I care about
If I am tempted to binge drink when I am feeling angry	then I will remember the information that people have personally given me on the benefits of quitting drinking
If I am tempted to binge drink when things are going really well for me	then I will seek out people who can increase my awareness about the problems of drinking
If I am tempted to binge drink when I go to party where there is a lot of drinking	then I will that warnings about the health hazards of drinking have an emotional effect on me
If I am tempted to binge drink when I am anxious about sex	then I will remember that I get upset when I think about illnesses caused by drinking
If I am tempted to binge drink when there are drinking games going on	then I will tell myself that I can choose to change or not to change
If I am tempted to binge drink when I have my feelings hurt	then I will tell myself that if I try hard enough I can keep from drinking
If I am tempted to binge drink when I am with someone I am attracted to	then I will remember that I feel more competent when I decide not to drink
If I am tempted to binge drink when I am feeling shy	then I will think about the type of person I will be if I am in control of my drinking
If I am tempted to binge drink when I feel like keeping up with my friends drinking	
If I am tempted to binge drink when I am nervous about being socially outgoing	

Table II

Means and standard deviations for Units of alcohol, frequency of binge drinking

Dependent Variable	Time Point	<i>Control</i>	<i>Active control</i>	<i>VHS</i>
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Units of alcohol (per week)	Baseline	23.85 (15.05)	22.58 (13.25)	22.40 (19.12)
	Follow-up	22.47 (13.59)	19.39 (12.41)	14.95 (12.14)
	Adjusted follow-up	21.87 (7.60)	19.59 (7.60)	15.27 (7.60)
Frequency of binge drinking (last 2 weeks)	Baseline	2.12 (0.99)	1.94 (0.99)	2.05 (1.24)
	Follow-up	1.94 (0.97)	1.78 (1.00)	1.24 (0.89)
	Adjusted follow-up	1.90 (0.80)	1.82 (0.80)	1.23 (0.80)

Footnotes

ⁱ Repeating the same analysis with gender as a second independent variable revealed that there was no gender x condition interaction for Units of alcohol consumed per week ($F[2,49] = 0.37, p = 0.69$).

ⁱⁱ Repeating the same analysis with gender as a second independent variable revealed that there was no gender x condition interaction for frequency of self-reported binge drinking ($F[2,49] = 0.67, p = 0.99$).