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A Brief Psychological Intervention That Reduces Adolescent Alcohol Consumption

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Objective. Alcohol consumption in adolescence is associated with problem drinking in later life and there is a need to develop evidence-based interventions to reduce adolescent alcohol consumption. The aims of the present study were to test the ability of a very brief intervention based on self-affirmation theory to reduce alcohol consumption in a sample of adolescents and to examine potential mediators of the effects.

Methods. 67 adolescents were randomly allocated either to form a self-affirming implementation intention or to complete a distracter task. All participants were exposed to a threatening message concerning the health risks of alcohol consumption. The main outcome measure was subsequent alcohol intake, but message processing (operationalized as perceived threat and message derogation), behavioral intention and self-efficacy were also measured as potential mediators.

Results. The intervention produced a significant decrease in alcohol consumption: Participants in the self-affirming implementation intention condition consumed 2.48 fewer grams of pure alcohol per day at the end of the study than adolescents who completed the distracter task. The effect was not mediated by perceived threat, message derogation, behavioral intention or self-efficacy.

Conclusions. The findings provide support for the efficacy of the self-affirming implementation intention for promoting health behavior change and extend previous research by testing an adolescent sample and observing longer-term effects. Further research is needed to find out what mediates the effects of self-affirming implementation intentions on health behavior change.

Key Words. adolescents, brief intervention, health behavior change, self-affirmation, alcohol, implementation intention.

A Brief Psychological Intervention That Reduces Adolescent Alcohol Consumption

Schools in the UK are legally obliged to integrate alcohol education throughout the curriculum (NICE, 2007), yet drunkenness among 13-15 year olds in the UK far exceeds that of comparable countries, including the US (see Currie et al., 2012). Concurrently, there is evidence that such alcohol education is perceived as threatening by some, and that subsequent defensive reactions (e.g., message derogation) undermine message persuasiveness (e.g., Leffingwell, Neumann, Leedy, & Babitzke, 2007). Further work is clearly needed to develop effective means of reducing alcohol consumption.

Steele's (1988; Sherman & Cohen, 2006) self-affirmation theory provides one approach to overcoming defensive reactions to health information. This theory states that people are motivated to defend their global sense of self-worth, which can be threatened by a health-risk message. Evidence shows that affirming the self by, for example, focusing on cherished values or elaborating on past acts of kindness, consistently improves message processing and boosts persuasiveness; however, whether these effects are translated into subsequent behavior change is less clear (Harris & Epton, 2009). One aim of the present study is therefore to examine whether a brief intervention based on self-affirmation theory (Steele, 1988) can reduce alcohol consumption.

Adolescence represents a key time for intervening to reduce alcohol consumption and it would be valuable to show that the promising findings from self-affirmation research in adults (e.g., Armitage, Harris, & Arden, 2011) can be replicated in adolescents. To date, manipulations have principally involved writing self-affirming essays (Harris & Epton, 2009), which may not be appropriate to adolescents. The present research therefore tests a self-affirmation manipulation that is brief and relies less on verbal fluency than essay writing, namely, the self-affirming implementation intention.

Implementation intentions are carefully-formulated plans that encourage people to link critical situations with appropriate behavioral responses (Gollwitzer, 1993). When implementation intentions are formed the salience of critical situations is enhanced and the appropriate behavioral response is triggered automatically (Gollwitzer, 1993). In relation to the threat induced by health risk messages, "feeling threatened or anxious" represents the critical situation (Harris, Napper, Griffin, Schuez, & Stride, 2011), and "remembering things that I have succeeded in" represent appropriate self-affirming responses (Harris et al., 2011). The present research therefore tests the effects of a self-affirming implementation intention on adolescent alcohol consumption. This not only addresses the dearth of literature on the effects of self-affirmation on subsequent health behavior change, but extends self-affirmation research beyond the undergraduate student population (Harris & Epton, 2009).

It is predicted that the self-affirming implementation intention will: (a) improve message processing and increase motivation with respect to reducing alcohol consumption; (b) significantly reduce alcohol consumption; and (c) exert effects that will be mediated through better message processing, more positive behavioral intentions and greater self-efficacy to drink less alcohol (Sherman & Cohen, 2006; Steele, 1988).

Method

Participants

Participants were recruited from a comprehensive school in the North of England. According to government figures almost 80% of pupils in England attend comprehensive schools. From an available sample of 105 adolescents, 67 agreed to participate (63.81%). Only adolescents who had drunk alcohol were invited and complete abstinence was the reason most commonly cited for declining participation. The baseline sample consisted of 37 girls and 30 boys aged 16-18 years ($M = 17.09$, $SD = 0.38$); consistent with UK census data[1], 90% (60/67) described themselves as "White." Unfortunately, the alcohol consumption of

16-18 year olds is typically included in figures for "young adults," (people aged 16-24 years) meaning that rates of alcohol consumption in the present sample cannot be compared directly with official figures (see Armitage, 2013). All analyses were subject to intention to treat with the last observation (i.e., the baseline measures) carried forward.

Design

The between participants factor was *condition*: Participants were randomized to either a self-affirming implementation intention condition or a control condition. The within-participants factor was the two-month *time* interval between baseline and follow-up. The main outcome measure was alcohol consumption. Baseline consisted of four phases: (i) pre-manipulation, (ii) self-affirming implementation intention/control questionnaire, (iii) health-risk message, and (iv) post-message reactions (i.e., message derogation and perceived threat).

The study was approved by the University [MASKED FOR BLIND PEER REVIEW] Institutional Review Board. Consistent with UK law, consent was given initially by teachers acting as legally authorized representatives and subsequently by adolescents who were told that they were free to choose whether or not to participate and that they could withdraw themselves or their data at any time. Adolescents who chose not to participate engaged in unrelated tasks. The experiment was run in classrooms, where the participants completed questionnaire packs in exam conditions under teacher supervision. Participants were randomly allocated to the self-affirmation condition ($n = 32$) or control condition ($n = 35$) on the basis of a web-based randomizer that determined the order of questionnaire pack distribution.

Materials

The self-affirming implementation intention is identical to that used by Armitage et al. (2011) and is based on Harris et al.'s (2011) work that identified ways in which people respond to threatening stimuli. In order to turn these into if-then statements in accordance

with Gollwitzer's (1993) recommendations, participants were first presented with the stem, "If I feel threatened or anxious, then I will…" (Harris et al., 2011). Participants were then presented with one of four options from Harris et al. (2011), including: "…think about the things I value about myself" (Armitage et al., 2011). In order to encourage participants to write the self-affirming implementation intention out in full, they were prompted with "If…" at the beginning of the first blank line.

The control questionnaire was a distracter task identical to that used by Armitage et al. (2011) and contained no self-relevant statements. Participants were asked their opinions on ten issues, including: "I think the color blue looks great on most people *yes-no*." When participants answered "yes," they were prompted to elaborate on their response.

The health-risk message consisted of a line drawing of the body that illustrated the thirteen parts of the body that are most affected by alcohol consumption alongside a list of thirty-nine medical conditions that are related to alcohol consumption. It was taken from page 7 of Babor, Higgins-Biddle, Saunders, and Monteiro's (2001) primary care guide to the use of the Alcohol Use Disorders Identification Test.

Measures

Alcohol consumption and motivation (e.g., behavioral intention) were measured at baseline before the self-affirming implementation intention manipulation/control questionnaire and threatening message, and at two-month follow-up. Reactions to the message were taken at baseline immediately after presentation of the health-risk message.

An adapted version of the timeline follow-back technique (Sobell & Sobell, 1992), designed to minimize memory errors was used to measure alcohol consumption before the self-affirmation manipulation and at follow-up. Participants were asked to describe in detail the types and number of alcoholic drinks they consumed in a typical week. Each day of the week was presented on a separate line and space was given to write a description. These

descriptions were converted to standard UK units (i.e., 8 grams) of alcohol. The validity of similar instruments has been established against several biomarkers, and when used in similar situations to the present study, self-reports have been shown to agree 97.1% with biological measures (Babor, Steinberg, Anton, & Del Boca, 2000).

Motivation was assessed at baseline and follow-up on 7-point (+1 to +7) Likert-type scales. These were phrased in terms of "drinking within the government's recommended levels," which differ depending on whether participants are aged 18 (the UK government recommends that women consume no more than 2-3 units per day; 3-4 units per day for men) or younger (for whom the government recommends abstinence)[2]. Behavioral intention was measured using three items ("I want / intend / plan to drink within the government's recommended levels *definitely do not-definitely do*"). Internal reliability was high at both baseline, $\alpha = .88$ and follow-up, $\alpha = .93$. Self-efficacy was measured with three items, including: "How confident are you that you will be able to drink within the government's recommended levels? *not very confident-very confident.*" Cronbach's α indicated high internal reliability at baseline, $\alpha = .85$ and at follow-up, $\alpha = .88$.

Message derogation was measured using Jessop, Simmonds, and Sparks' (2009) items on 7-point (+1 to +7) Likert-type scales. Participants were presented with the stem: "What did you think about the information you just read? Did you think it was…" to which they responded on five scales (e.g., *not at all over-blown—very over-blown*). Cronbach's α indicated excellent internal reliability ($\alpha = .95$). Five items adapted from Witte (2011) were used to measure *perceived threat* on 7-point (+1 to +7) Likert-type scales; participants were asked to complete the stem, "The information made me feel…" (e.g., *not at all frightened-very frightened*). Cronbach's α indicated high internal reliability ($\alpha = .95$).

Procedure

The adolescents were asked if they would be willing to participate in a study measuring "personal and social beliefs about alcohol consumption," which would involve filling out a second questionnaire two months later. The first page, entitled "personal and social beliefs questionnaire," gave information regarding consent and ethics, as well as instructions for completing the measures, and a description of the government's alcohol consumption guidelines. There followed measures to assess demographic variables, behavioral intention, self-efficacy, and alcohol intake. The self-affirming implementation intention manipulation or distracter task appeared next followed by the health-risk message, which was designed to reduce alcohol consumption. Reactions to the message were measured on the page immediately following the health-risk message.

The only difference between the experimental and control conditions was the material that appeared on the third page, namely, the self-affirmation manipulation or the control questionnaire. This meant that the person randomizing the questionnaires, the person administering the questionnaires and the participants were blind with respect to condition. Participants returned their questionnaires via sealed boxes.

Results

The success of the randomization procedure was checked using MANOVA. The independent variable was *condition* with two levels: Self-affirming implementation intention versus control. The dependent variables were age, gender, and baseline measures of alcohol intake, behavioral intention and self-efficacy. The multivariate test, $F(5, 61) = 0.09$, $p = .99$, $\eta_p^2 = .01$, and all the univariate tests, $Fs(1, 65) = 0.01$ to 0.31, $ps > .57$, $\eta_p^2s < .01$, were nonsignificant, indicating successful randomization.

The effect of self-affirming implementation intention on alcohol consumption was tested using mixed ANOVA, with *condition* as the between-persons factor (self-affirming

implementation intention versus control) and *time* (baseline versus follow-up) as the within-persons factor. The interaction between condition and time was statistically significant, $F(1, 65) = 4.68$, $p < .05$, $\eta_p^2 = .07$ (Table 1). ANCOVA, with condition as the between-persons factor, alcohol consumption at follow-up as the dependent variable and baseline alcohol consumption as the covariate was used to decompose this interaction. These analyses showed follow-up alcohol consumption was significantly lower in the self-affirmed group controlling for baseline consumption, $F(1, 64) = 4.62$, $p = .03$, $\eta_p^2 = .07$ (Table 1). The self-affirming implementation intention manipulation had a medium-sized effect ($r = .27$, $d = 0.56$, Cohen, 1992) in reducing adolescents' alcohol consumption.

Contrary to predictions, there were no significant differences between conditions on perceived threat and message derogation (Table 2), behavioral intention or self-efficacy (Table 1)[3]. Follow-up alcohol consumption was regressed on perceived threat, message derogation, behavioral intention and self-efficacy. Behavioral intention was the sole significant predictor of follow-up alcohol consumption (Table 3).

Discussion

This is the first study to look at the ability of a self-affirming implementation intention to reduce adolescent alcohol consumption. The key finding was that the self-affirming implementation intention was effective in reducing alcohol intake. By the end of the study, participants in the self-affirming implementation intention condition drank on average 2.48 fewer grams of pure alcohol per day compared with participants in the control condition. However, the self-affirming implementation intention did not exert the hypothesized effects on the measures of reactions to the message nor on motivation. The discussion focuses on the practical and conceptual implications of these findings.

The medium-sized effect (Cohen 1992) of the self-affirming implementation intention on alcohol consumption ($d = 0.56$) bears comparison with Moyer, Finey, Swearingen, and

Vergun's (2002) meta-analysis which reported a medium-large mean effect size ($d = 0.67$)

for brief interventions to reduce alcohol consumption in non-treatment-seeking samples with

follow-ups shorter than three months. Arguably, the findings of the present study show

greater potential because Moyer et al.'s (2002) definition of "brief" included interventions

with up to four sessions, whereas the present intervention was self-directed and completed in

fewer than 5 minutes, meaning that it could easily be integrated into school alcohol education

programs.

      In contrast with theory (Sherman & Cohen, 2006; Steele, 1988) and empirical

evidence (Harris & Epton, 2009) the effect of the self-affirming implementation intention on

alcohol consumption was not mediated by reactions to the health-risk message or motivation.

One explanation of this null finding is that we measured only a subset of possible influences

on reactions to the message and motivation, and it would be valuable to replicate the study

with additional measures of message reactions (e.g., defensive avoidance, see Armitage et al.,

2011). A second possibility is that the "critical situation" element of the implementation

intention is oriented toward general feelings of threat and anxiety ("If I feel threatened or

anxious…"). Given that negative affect – more than any other reason for drinking (e.g.,

positive affect) – increases the risk of developing problems with alcohol (e.g., Carpenter &

Hasin, 1999), the self-affirming implementation intention may have helped participants cope

with negative affect from sources other than the health-risk message[4]. Nevertheless, it would

be valuable in future research to ascertain the extent to which the "self-affirming

implementation intention" is truly "self-affirming."

      Despite the significant effect of the self-affirming implementation intention in

reducing alcohol intake, it is important to highlight some possible limitations. First, in order

to fit into the school's academic year, a two-month follow-up was used rather than the six-

month follow-up, which is widely-regarded as the time it takes for healthy habits to be

established. Second, although confidentiality was assured by means of sealed boxes, it is plausible that the presence of teachers influenced the self-reports of alcohol consumption in some way. However, we have no way of knowing whether or not this occurred, and in which direction the effects might have been. It would be valuable to examine the effects of changing the person administering the test (e.g., Armitage, 2013). Third, although adequately powered to detect the significant effect of a self-affirming implementation intention on alcohol consumption, the sample size was relatively small and was recruited from a single school, albeit with demographic characteristics that were broadly representative of the general population. Further research is required to establish whether the present findings generalize beyond the present context (see Armitage et al., 2011).

The present study demonstrates the effectiveness of a self-affirming implementation intention for reducing alcohol consumption in a sample that represents a key target for reducing alcohol consumption, namely, adolescents. The research extends the reach of self-affirmation beyond the undergraduate student population and beyond the laboratory by showing positive effects up to eight weeks post-intervention. The intervention is sufficiently brief and easy to administer that it could be incorporated into school alcohol education programs. Further work needs to establish the variables that mediate the effects of self-affirming implementation intentions.

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Footnotes

[1] http://www.ons.gov.uk/census/index.html

[2] There were no significant differences between those who were younger than 18 ($n = 59$) and those aged 18 years ($n = 8$) on any of the dependent variables, $F(1, 65) = 1.44$, $p = .22$, $\eta_p^2 = .11$. Relative to the 18-year-old group, the under-18s scored marginally lower on perceived threat and message derogation, drank marginally less alcohol, and scored marginally higher on behavioral intention and self-efficacy. In other words, there was a nonsignificant trend towards under-18s viewing abstinence as more acceptable and achievable than the 18-year-old group's view of reducing their alcohol intake. However the small numbers of participants aged 18 years (4 women, 4 men) means that caution should be adopted in interpreting these findings. Nevertheless, it would be valuable to conduct further research that examines the transition between 17 years and 18 years (i.e., to being able legally to acquire alcohol in the UK).

[3] Consistent with the analyses where alcohol consumption was the dependent variable, the effects of the self-affirming implementation intention on motivation were tested using mixed ANOVAs, with *condition* as the between-persons factor and *time* (baseline versus follow-up) as the within-persons factor. The interaction between condition and time for both behavioral intention, $F(1, 65) = 0.04$, $p = .84$, $\eta_p^2 < .01$, and self-efficacy, $F(1, 65) = 2.31$, $p = .14$, $\eta_p^2 = .03$, were nonsignificant. Thus, although the self-affirming implementation intention exerted a significant effect on alcohol consumption, it was not significantly mediated through message processing, behavioral intention or self-efficacy.

[4] It is notable that perceived threat induced by the message was low across both conditions ($M = 2.14$, $SD = 1.20$, on a +1 to +7 scale) meaning it is unlikely that the message elicited any negative emotions. Thus, although the message used in the present study was similar to standard alcohol education materials (NICE, 2007), it would be valuable to see whether a

more threatening message would trigger the processes outlined in self-affirmation theory

(Sherman & Cohen, 2006; Steele, 1988).

Table 1

Effects of the Interventions on Alcohol Consumption, Behavioral Intention and Self-Efficacy

| | Baseline | | Follow-up | |
Dependent Variables	*M*	*SD*	*M*	*SD*
Mean Alcohol Consumption (in units, i.e., 8 grams alcohol per day)				
Control Group (*n* = 35)	1.47	1.52	1.60[a]	1.65
Experimental Group (*n* = 32)	1.46	1.60	1.29[b]	1.60
Behavioral Intention				
Control Group (*n* = 35)	3.70	1.82	3.81	1.72
Experimental Group (*n* = 32)	3.91	1.67	3.93	1.81
Self-Efficacy				
Control Group (*n* = 35)	4.88	1.68	5.29	1.51
Experimental Group (*n* = 32)	5.23	1.55	5.07	1.76

Note. The reported means are "raw" and not adjusted for baseline values. The condition *x* time interaction associated with alcohol consumption is statistically significant, $F(1, 65) = 4.68, p < .05, \eta_p^2 = .07$. Columns with different superscripts indicate significant differences ($p < .05$) at follow-up controlling for initial alcohol consumption. The *SD*s associated with alcohol consumption are relatively large and so the data were analyzed for potential outliers. Despite inviting only those adolescents who had drunk alcohol, the largest outlier was zero alcohol consumption (i.e., from adolescents who did not *typically* drink alcohol). Reanalyzing the data after removing participants who reported not typically consuming alcohol at baseline made no substantive difference to the findings: The resulting time *x* condition interaction was, $F(1, 53) = 4.17, p < .05, \eta_p^2 = .07$.

Table 2

Effects of the Intervention on Reactions to the Message

Dependent Variables	Experimental		Control		F	η_p^2
	M	SD	M	SD		
Perceived Threat	2.02	1.14	2.25	1.26	0.59	< .01
Message Derogation	3.32	1.52	3.26	1.55	0.02	< .01

Note. Mean values are "raw" and unadjusted for baseline covariates. The effects of the self-affirming implementation intention on reactions to the message was tested using MANOVA with condition as the between-persons factor, and perceived threat and message derogation as the dependent variables. Contrary to predictions, there were no significant differences between conditions, $F(2, 64) = 0.60$, $p = .55$, $\eta_p^2 = .02$.

Table 3

Multiple Regression Analysis Predicting Alcohol Consumption at Follow-Up

	Alcohol Consumption		
Predictor	β	R^2	*F*
		.28	6.03**
Perceived Threat	-.08		
Message Derogation	-.03		
Behavioral Intention	-.44**		
Self-Efficacy	-.10		

**$p < .01$