Does Other-Affirmation Increase Self-Directed Exposure to and Persuasiveness of a

Threatening Anti-Alcohol Message?

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Statement of Contribution

What is already known on this subject?

Self-Affirmation of personally-important values can reduce defensive responding to threatening health communications.

Self-Affirmation effects have been shown to be mediated by feelings of connectedness.

What does this study add?

Affirmation of personally-important values in others can improve effects of a health communication.

Other-affirmation effects may be greater in those with defensive coping styles.

Other-affirmation was mediated by enhanced perceptions of others and their values.

Does Other-Affirmation Reduce Defensiveness and Increase Persuasiveness of a

Threatening Anti-Alcohol Message?

ABSTRACT

Objective: Self-affirmation of personal values can reduce defensive responses to threatening health promotion messages, probably because it induces a positive and expansive view of the self. However, coping with threat is also an interpersonal process. We developed other-affirmation inductions that focus on values held by others. Two studies examined the effects of common affirmation inductions modified for other-affirmation; affirmation of a specific value (kindness) and affirmation of a personally-chosen value. **Design**: Randomised and controlled three-group (self-, other- or no affirmation conditions) single-factor design. Outcomes were time spent in self-directed viewing the message and self-reported outcomes that included intentions to reduce drinking, evaluations of the message and risk perceptions. **Methods**: Students were randomised to self, other or no affirmation conditions and asked to read a threatening anti-alcohol message. **Results**: Self and other affirmation increased message viewing time in Study 1. In both studies, other-affirmation increased self-reported outcomes, and study 1 showed this effect to be more prominent in females. In Study 1, the effects of self and other-affirmation on message exposure were greater in participants with defensive coping styles, and other-affirmation effects were mediated by more positive views of others and their values. This mediation was independent of self-affirmation. **Conclusion**: Other-affirmation increased self-reported outcomes and, in Study 1, reduced defensiveness to and improved viewing times to an anti-alcohol message. Other-affirmation could be useful, because it may be suited to particular sub-populations, such as females, and can be easily incorporated into mass-reach health communications.

Keywords: Affirmation; Persuasion; Defensiveness; Social Connectedness; Alcohol.

Worldwide, individuals' unhealthy behaviours, such as smoking and excess drug, alcohol and food consumption, are major contributors to population mortality and morbidity (Kontis, et al., 2014). Mass-reach health promotion campaigns convey persuasive messages designed to encourage large numbers of people to change behaviour (Wakefield, Loken & Hornik, 2010). These campaigns frequently use vivid and disturbing images and themes to attract audience attention and portray the consequences of unhealthy behaviour (Durkin, Beiner & Wakefield, 2009). However, some field and experimental evidence suggests that the distressing nature of these presentations induces defensive responses, such avoidance, denial, reappraisal of message meanings or suppression of message content, which reduce distress but also impair persuasion (van 't Riet & Ruiter, 2013).

Self-Affirmation and Defensiveness

A large body of evidence shows that affirmations of personally-important values reduce defensive responding to distressing health messages (Klein & Harris, 2009; van Koningsbruggen, Das & Roskos-Ewoldsen, 2009), which consequently increases intentions to improve health behaviour and behavioural change (Epton, Harris, Kane, et al., 2015). According to self-affirmation theory (Steele, 1988), people strive to maintain a global sense of self-integrity - perceptions of competence and moral worth. Distressing health promotion messages threaten future illness and personal loss, but also affect self-integrity by promoting the idea that one is personally responsible for future illness, and they can carry implicit social censure and threaten autonomy (Turoldo, 2009).

Self-affirmation inductions fortify self-integrity by asking individuals to focus upon core values, such as generosity, fairness or self-reliance (Cohen, G.L. & Sherman, 2014). Affirmation is held to induce a holistic and expansive view of the self, that reduces focus on

3

threats, thus allowing people to see threats in a wider perspective and to identify personal coping resources and make coping plans (Critcher & Dunning, 2015).

Other-Affirmation

The focus on self-integrity, though, can overlook the importance of social and interpersonal processes in coping with threat. Attachment theory, for example, describes how people innately seek comfort from attachment figures when threatened (Mikulincer & Shaver, 2010), and the social support literature demonstrates that support from others induces effective coping and improves well-being (Cohen, S. & Janicki-Deverts, 2009). These literatures emphasise the importance of explicit assistance from others, but also perceptions that others are caring and trustworthy (Mikulincer & Shaver, 2010). Therefore, helping people to perceive that they are connected with others ought to expand their views beyond the self to include social resources and opportunities for coping (Crocker, Niiya & Mischkowski, 2008).

Specific to value affirmation, the core values that form the focus of self-affirmation inductions are frequently anchored in community norms and transactions. Schwarz (2012) shows that values are underpinned by dimensions of self-transcendence and self-enhancement. Transcendence emphasises interpersonal connectedness. Self-enhancement emphasises the promotion of personal interests. It is reasonable to hypothesise that interventions to increase the salience of core transcendent values will permeate beyond the self to emphasise interconnectedness with others. This indeed seems to be the case. Crocker, Niiya, and Mischkowski (2008) show that feelings of connection with others mediate the link between self-affirmation and defensiveness. Burson, Crocker and Mischkowski (2012) show that affirming transcendent values better facilitates adaptive coping responses than affirming self-enhancing values.

Connectedness, by definition, is a reciprocal process. Reciprocation of support-giving, for example, enhances well-being (Kim, Han, Moon, Shaw, et al., 2012), as does value congruence between self and others (Sorthiex & Lönnqvist, 2015). Thus, we propose that interpersonal connectedness can be effectively targeted by affirmations that increase the sense that personally-important values are reflected in others. Specifically, self-affirmation interventions focus upon personal values. Other-affirmation reverses this by simply asking participants to focus upon how others hold and enact personally-important values.

The practical application of an effective other-affirmation intervention is that it could help to target specific audiences or behaviours. As an explicitly social intervention, other-affirmation may be highly applicable to populations where interpersonal connectedness is particularly valued and sought. Females, for example, score more highly on self-transcendent values than males (Coward, 1996) and show stronger social orientations (Gibbons & Buunk, 1999). Thus, although there is little indication that females benefit less from self-affirmation than males (Epton, et al., 2015), they may nonetheless benefit from other-affirmation. Similarly, behaviours practiced in a social context, such as substance use, might be influenced by an explicitly social intervention such as other-affirmation. Another advantage of other-affirmations is that self-affirmation often demands effortful or supervised exercises that might be difficult to incorporate into mass-reach interventions (Armitage, Harris & Arden, 2011). Other-affirmation manipulations can probably be more easily integrated into mass-reach communications because they could potentially be activated by relatively simple portrayals of others holding and enacting values that are important to audiences.

Current Research

Our aim was to examine the effectiveness of other-affirmation inductions in reducing defensiveness to a potentially threatening health promotion message. Two studies examined the

effects of other-affirmations, based on common self-affirmation inductions, in reducing defensiveness and increasing persuasiveness of distressing images. The first examined the effects of writing about a prominent single value, kindness (Reed & Aspinwall, 1998), as reflected in others. The second, the effects of writing about how others hold and enact personally-chosen important values (Harris & Napper, 2005). A persuasive anti-alcohol message, containing distressing imagery and recommending reductions in alcohol use and binge drinking, was presented to a university sample. Worldwide, alcohol misuse constitutes the greatest risk factor for harm to people aged 15-49 (Forouzanfar, Ashfin, Alexander, Biryukov, Brauer, et al., 2016). Students show high alcohol consumption (O'Malley & Johnston, 2002) and alcohol-related morbidity (Knight, Wechsler, Kuo et al., 2002), and also respond defensively to alcohol-related messages (Brown & Locker, 2009).

In persuasion research, defensiveness can be difficult to discriminate from disinterest or reactance. Nonetheless, affirmation induction can be shown to reduce defensiveness if it has stronger effects on individuals who face objectively greater susceptibility to poor health outcomes (De Hoog, Stroebe & De Wit, 2005) or who have dispositional tendencies toward defensiveness (Brown & Richardson, 2012). We examined whether affirmation effects were stronger in participants with greater objective vulnerability to alcohol-related problems and those scoring higher on dispositional defensive coping (Carver, Scheier & Weintraub, 1989).

It is theoretically important to show that other-affirmation is more than merely a method of generating self-affirmation effects. Further, other-affirmation will be most useful if it can be shown to increase message effects independently of self-affirmation, allowing it to be used where self-affirmation may be less effective. In Study 1, we measured self-affirmation, the salience of positive self-relevant thoughts (Napper, Harris & Epton, 2009), and other-affirmation, salient positive thoughts of others. Mediation of other-affirmation effects by other-

6

affirmation scores after controlling mediation by self-affirmation shows independence. We also assessed the independence of self-affirmation effects.

In both studies, we compared self and other-affirmations to a no affirmation control. Outcome variables were participants' self-directed exposures to a distressing anti-alcohol message (Brown & Locker, 2009) and self-reported changes in intentions to reduce alcohol use, participants' evaluations of the message and risk perceptions (Good & Abraham, 2007). Across the studies, we tested three hypotheses:

Hypothesis 1. Compared to a no-affirmation control, self and other-affirmation inductions would increase viewing time and self-reported outcomes including intentions, message evaluations and risk perceptions.

We also examined gender differences in self and other-affirmation effects.

Hypothesis 2: Self- and other-affirmation effects will be stronger in participants with greater objective vulnerability to alcohol-related problems (hypothesis 2a) and in those scoring more highly on defensive coping scales (Hypothesis 2b).

Hypothesis 3: That self and other affirmation effects will be independently mediated by measures of self and other-affirmation respectively (Study 1 only).

STUDY 1

The Kindness Questionnaire induces self-affirmation by asking participants to recall acts of past personal kindness (Reed & Aspinwall, 1998). An other-affirmation that is based on kindness shown by others could have considerable practical utility, because portraying acts of kindness by others can be integrated into mass-reach health promotion messages.

METHOD

Participants

The study was approved by the _____ Committee on Research Ethics (IPHS-1415-051). Participants were students at a UK university aged between 18-30 years who drank at least one alcoholic drink per month. Recruitment was via personal approach in public areas of the university. The sample included 172 males and 104 females with a mean age of 19.29 (*SD*=1.72). Nine participants reported drinking monthly or less, 95 reported drinking two to four times a month, 161 reported drinking two or three times a week and 11 reported drinking four or more times per week. When asked how often they binge drank, defined to them as more than five standard drinks on one occasion for males and more than four for females, 11 reported never, 41 monthly or less, 111 reported binge drinking two to four times a month, 110 reported binge drinking two or three times a week and 3 reported drinking four or more times per week.

Materials

Affirmation manipulation: The self-affirmation manipulation used Reed and Aspinwall's (1998) kindness questionnaire. The kindness questionnaire consists of ten questions asking participants to think about and describe in writing ten previous acts of personal kindness, for example *'Have you ever been generous and selfless to another person?'*. The other-affirmation manipulation preserved the format, but reversed the questions by asking participants to describe ten acts of kindness that others have performed, for example *'Has anybody ever been generous and selfless to you or another?'* Commonly, control conditions in self-affirmation research have participants to write about their least important personal value with reference to either themselves or others. However, choice of either would differentially affect comparisons with self-and other-affirmation conditions. Instead the control condition requested that participants describe their opinions on ten unrelated questions, for example *'I think that winter is the most satisfying season of the year?'*. As an inert control, this task would not advantage either affirmation condition, but the disadvantage is that there is no control for

value elicitation per se. Task instructions were contained in booklets. Booklets containing affirmation or control tasks were allocated to experimenters in a sequence determined by a random number generator. Experimenters allocated participants booklets in this sequence without opening them, and thus were blind to condition.

Anti-alcohol message: Our distressing anti-alcohol message has been shown to induce defensive avoidance (Brown & Richardson, 2012; Brown & West, 2015). A booklet presented a threat message, accompanied by vivid and disturbing images, and then a behavioural recommendation. The message contained 989 words (including picture captions). Flesch reading ease was 65.4 and Flesch-Kinkaid Grade level 7.7, making the text accessible to the 13-15 year age range (Kincaid, Braby & Mears, 1988). The message was split into three booklets; introduction, threat and recommendation booklets. The introduction explained that the materials are designed to encourage the drinker to consider reducing drinking and that all statements are supported by reliable sources. Alcohol misuse and binge drinking were defined, government drinking guidelines explained, and the booklet provided general information on the consequences of misuse (e.g., 'alcohol affects alertness and judgment, therefore increasing the risk of falls and accidents'). There was no imagery in this section.

A threat component provided information pertaining to seven specific consequences: Liver disease; Vascular disease; Cancer; Pancreatic disease; Traffic accidents; Being a perpetrator or victim of antisocial behavior; and Skin disease. The proportional relationship between risk and alcohol consumption was emphasised as were the effects of binge drinking. Text was accompanied by photographic portrayals of severe health consequences, using graphic and unsettling images; including a swollen diseased liver and pancreas, a severely facially-disfigured burns patient from a car crash, images of badly damaged cars where it was clear that a driver would have been severely injured, and an image of a male with severe facial disfigurement from surgery to remove a tumor. High resolution color images were used.

The recommendation booklet focused on outcome-efficacy and self-efficacy for reducing alcohol consumption (e.g., 'most young people find it much easier to reduce consumption than they think.') but contained no images. Participants were told that excess risk attributable to alcohol could be reduced by cutting down consumption and that most young people who try to cut down succeed in doing so. Eight tips for reducing consumption were provided (e.g., 'Set a budget', 'Only take a fixed amount of money to spend on alcohol.').

<u>Moderating Variables</u>: Vulnerability to alcohol-related problems was measured using a five-item version of the Alcohol Use Disorders Identification Test (AUDIT) developed for younger drinkers and tested on a British sample aged 16-19 (Miles, Winstock & Strang, 2001). The AUDIT effectively detects hazardous drinking patterns and drinkers at risk of dependence (Reinert & Allen, 2007). Items in the version we used were the frequency of drinking days, quantities of alcohol drunk on those days, the frequency per year of 'not able to stop drinking once you had started' and 'failed to do what others have expected of you because of your drinking' and whether during the past year a friend, relative or health professional had expressed concern over the participant's drinking or suggested they reduce drinking.

We used dispositional denial, mental disengagement and behavioural disengagement scales of the COPE (Carver, Scheier & Weintraub, 1989) to measure defensiveness. The COPE has been extensively used in health research, and these scales are associated with a lower uptake of preventive health behaviours (Power, Koopman, Volk et al., 2005) poorer illness outcomes (Carver, Pozo, Harris, et al., 1993) and predict lower viewing times and lower persuasion in participants presented with emotive, compared to less emotive, health messages (Brown & Locker, 2009; Brown & Richardson, 2012). Participants are asked to state their usual coping responses to 'difficult or stressful events'. Each scale consists of four items (e.g., 'I say to myself "this isn't real."' (denial) 'I turn to work or other substitute activities to take my mind off things' (mental disengagement)). Scores are recorded on a four-point scale with the following labels; 'I usually don't do this at all', 'I usually do

this a little bit', 'I usually do this a medium amount' and 'I usually do this a lot'. Item means were calculated with higher scores representing greater defensiveness.

Self-reported outcomes: Outcome variables were chosen because they predict behavioral responses to health messages and are sensitive to defensive processing (Good & Abraham, 2007). Participants were asked to evaluate the pamphlet on the following dimensions: Persuasive/not persuasive; Bad/good; Clever/stupid; and Not effective/effective on a seven point scale from -3 to 3 (Freeman, et al., 2001). Mean item scores are presented with positive scores denoting positive evaluations. Intentions to reduce drinking were measured using three items pertaining to whether participants intended, were willing or planned to reduce drinking in the next three months (e.g., To what extent are you willing to reduce drinking in the next three months?). Responses were made on 1-7 Likert scales anchored by the terms 'not at all' and 'completely'. Mean item scores are presented, with higher scores denoting greater intention. Alcohol-related risk perceptions were assessed using a scale developed by Brown and Locker (2009) and used by Brown and Richardson (2011). To eliminate the confounding effects of intentions to change behaviour in the future, participants were asked to make conditional estimates by including the text "If you continue to drink the way that you do" before each item (van der Velde, van der Pligt & Hooykaas, 1996). Participants rated the likelihood of alcohol creating serious relationship difficulties for them, them becoming addicted to alcohol, developing a serious liver disease, insulting or being rude to people, experiencing serious difficulties with family relationships, receiving serious injuries in a fight, having conflict or difficulties with friends due to alcohol, and experiencing withdrawal symptoms. Estimates were rated on a seven-point likert scale anchored by the terms 'no chance' and 'certain', with higher scores denoting greater risk.

Mediating Variables: Participants were given a seven-item self-affirmation questionnaire used by Napper, Harris and Epton (2009). Items referred to participants' perceptions of themselves and their values (e.g., 'The message made me think of positive aspects of myself', 'The message made me

aware of my values'). Responses were recorded on Likert scales from 1 to 7. Item mean scores were used with higher scores indicating self-affirmation. An other-affirmation questionnaire was constructed to be identical to the self-affirmation questionnaire, but items were changed to reflect other people and their values (e.g., 'The message made me think of positive aspects of others', 'The message made me aware of the qualities of others'). One item ('The message made me aware of who I am') was removed because it could not be changed to reflect others' values. The Cronbach alpha was 0.88.

Procedure

A cover story, provided during recruitment, stated that the research was intended to test audience acceptability of anti-alcohol messages. Post-test debriefing confirmed that participants believed this. Participants were informed that they would view potentially distressing medical and social images of alcohol-related disease. They were asked to complete the pre-manipulation questionnaire consisting of demographic variables, AUDIT and the COPE denial scale. Booklets were pre-sorted, with the introduction booklet on the top of three booklets placed in front of the participant. Participants were asked to read them in sequence. Each participant read the booklets in the presence of the experimenter, then completed the post manipulation questionnaire.

We timed participants' self-directed exposures to the recommendation and the threat booklets separately using a stopwatch application on a mobile phone. The experimenter pretended to play with their phone whilst participants read the message, but in reality timed the duration that participants attended to threat and recommendation messages (Brown & Locker, 2009; Brown & West, 2015). The introduction, threat and recommendation booklets were colour coded to make it easy to identify which each participants was reading. Timing started when the participant opened the booklet and finished when the booklet was closed. Time was added if the participant reopened a booklet. Time was recorded in seconds. Viewing times for the threat and recommendation sections of the message

were highly correlated (r=0.53, p<.01). Initial analyses of the data showed identical findings for threat and recommendation variables. Thus, for brevity, the viewing times were summed in the analyses presented in this report.

Analysis plan

Hypothesis 1: 3x2 ANOVAs examined the effects of condition and gender on self-directed message exposure time and self-reported outcome variables. Where interactions with gender occurred, they were tested using main effects analyses within gender groups with Bonferroni testing of between group differences.

Hypothesis 2: PROCESS v3.1 (Hayes, 2017) Model 2 was used to test the predictions that affirmation effects are stronger in higher AUDIT (Hypothesis 2a) or defensive coping (Hypothesis 2b) scorers. Three-way interactions were not tested. Interactions were modelled from the products of dummy self- or other-affirmation variables (coded as affirmation=1 and control=0) and centred Audit and defensiveness scores. Bias-corrected and accelerated bootstrapping was performed with 5,000 resamples to estimate unstandardized betas of the interactions and 95% confidence intervals. Where interactions were noted, follow-up single moderator analyses were conducted to provide data for plotting and to estimate the Johnson-Neyman (Hayes & Matthes, 2009) region defining statistical significance of the conditional effect.

Intention, message evaluation and risk variables showed intercorrelations of between 0.40 and 0.49. To reduce the number of significance tests for hypotheses 2 and 3, we subjected these variables to a factor analysis that showed a single factor with an eigenvalue of 1.76 that accounted for 58.74% of variance. Factor loadings were between 0.68 and 0.84. This factor, 'self-reported outcomes', was saved as a standardized score and used as an outcome variable.

<u>Hypothesis 3</u>: Indirect effects were tested using PROCESS model 4 for parallel mediation (Hayes, 2017). The two dummy binomial variables were again used to establish whether self and other-affirmation scores mediated affirmation effects on viewing time and the self-reported outcomes factor. Bias-corrected and accelerated bootstrapping was performed with 5,000 resamples to estimate the indirect effect with 95% confidence intervals.

Study 1 Results

Means, standard deviations and intercorrelations for study variables are shown in Table 1. Mean AUDIT scores were similar to a comparable sample (Brown & Locker, 2009). Participants viewed the message for slightly longer than four and a half minutes, which is similar to previous studies using the message (Brown & Locker, 2009; Brown & West, 2015).

<u>Hypothesis 1</u>: Table 2 shows within gender means and standard deviations and ANOVA results for main and condition*gender interaction effects with within gender Bonferroni post hoc analyses for the effect of affirmations on viewing time and self-reported variables. Both Self and Other-Affirmation treatments increased viewing times compared to No-Affirmation in males but not females. Self-reported outcomes showed consistent main effects with no significant interactions. However, Bonferroni analyses showed a consistent within gender pattern, whereby self-affirmation led to higher self-reported outcome scores than the control in males, and other-affirmation to higher scores than the control in females.

<u>Hypothesis 2</u>: Table 3 shows outcomes of the moderation analyses. We did not find any moderation by mental or behavioural disengagement scores, and for brevity do not publish these analyses. No two-way interactions were noted for either affirmation manipulation in

predicting viewing time. Self-and other-affirmations interacted with denial in predicting self-reported outcomes factor scores, but the affirmation *AUDIT interactions were not detected.

Figures 1a and 1b show the significant affirmation*denial interactions, with similar moderation of self- and other-affirmation effects. Higher denial scorers exposed to self- and other-affirmation conditions reported the highest self-reported outcomes. Johnson-Neyman (Hayes & Matthes, 2009) estimates of significance regions for the conditional effect were similar for self-and other affirmation; above 1.31 for self-affirmation (effect=0.30, SE=.145, 95% CI .00 to .59), and above 1.19 for other-affirmation (effect=0.30, SE=.15, 95% CI .00 to .59).

Hypothesis 3: Table 4 shows mediation analyses. The effects of both affirmation manipulations on all outcome variables were mediated by the total effect of self- and other-affirmation scales. The effect of the self-affirmation manipulation on the self-reported outcomes factor was independently mediated by self-affirmation scores, and the effect of other-affirmation on self-reported outcomes was independently mediated by other affirmation scores.

DISCUSSION AND STUDY 2 RATIONALE

Study 1 findings showed that self- and other-affirmation increased viewing time and self-reported outcome measures. Prominence of these effects in participants showing higher scores on defensiveness measures suggests that effects may be realised through defensiveness reduction. Indirect analyses showed some evidence that a measure of self-affirmation independently mediated self-affirmation effects and a measure of other-affirmation independently mediated other-affirmation effects. Study 2 was designed to extend these findings to another common affirmation induction, a standard values affirmation task where participants nominate their most important value, then write about why it is important to themselves (Harris & Napper, 2005) or others. If hypotheses were to be supported, this study

would increase the generality of Study 1 findings and address a potential confound in Study 1; that the kindness other-manipulation might affirm perceptions of the availability of social support from others in addition to their values. Other than the manipulation, methods were identical to Study 1. Study 2 tested hypotheses 1 and 2 only.

METHOD

Participants

Power analysis was based on the average effect of condition on the four outcomes in Study 1 (η_p^2=.047). 199 participants were required to detect this effect size (α=.05, power=.80). The sample included 70 males and 124 females with a mean age of 19.92 (*SD*=1.79). 26 (13.4%) participants reported drinking monthly or less, 68 (35.1%) reported drinking two to four times a month, 90 (46.4%) reported drinking two or three times a week and 10 (5.2%) reported drinking four or more times per week. Binge drinking was; 7 (3.6%) never, 58 (29.9%) monthly or less, 68 (35.6%) two to four times a month, 58 (29.9%) two or three times a week and 2 (1.0%) four or more times per week.

Materials

Affirmation manipulation: Participants chose their most important value from a list of 10 transcendent values (Schwarz, 2012). They were permitted to use non-list values if they wished. They wrote down the value and subsequently wrote 2-3 sentences on why it was important to them. The other-affirmation manipulation preserved the format, but asked participants to describe how their own most important value was important to others. The control condition involved asking participants to identify the most important office equipment from a list of ten, including desks filing cabinets, computers etc., and describing the interior and equipment of a typical office (Storr & Sparks, 2016).

<u>Self-reported outcomes</u>: Again, intention, message evaluation and risk were intercorrelated (0.38 to 0.49). Factor analysis that showed a single factor with an eigenvalue of 1.97, that accounted for 59.89% with loadings between 0.68 and 0.84.

Results

<u>Hypothesis 1</u>: No interaction effects were observed, thus we present only main effects for condition in Table 2. Effects were smaller than Study 1. Affirmation condition did not affect viewing times. Of the self-reported variables, our manipulations showed a main effect on message evaluation. Post hoc testing showed that other-affirmation led to greater positive message evaluations than the control. Other-affirmation caused higher mean risk perception scores, but this was not statistically significant as either a main effect or in post hoc testing (p=.072).

<u>Hypothesis 2</u>: We did not find any moderation by denial or behavioural disengagement scores, and do not publish these analyses for brevity. The interactions of the self-affirmation manipulation, and to a lesser extent other-affirmation, with mental engagement in predicting viewing time showed some moderation effect, but the 95% C.I. did not exceed zero (Table 3).

STUDY 2 DISCUSSION

Study 2 used a different affirmation manipulation to Study 1, but did not achieve as clear cut findings. Affirmation effects on viewing times were substantially smaller than those observed in Study 1. Effects on self-reported outcomes were more in line with Study 1, but slightly smaller. A main effect favouring other affirmation over the control was found on message evaluation, but not viewing time or other self-reported outcomes. Further, interactions between affirmation and defensiveness were not observed, thus there is no evidence that the affirmation effects achieved in this study were stronger in defensive individuals.

OVERALL DISCUSSION

Prefacing a distressing health message with an other-affirmation manipulation increased viewing times in Study 1, and facilitated self-reported outcomes in studies 1 and 2. Self-affirmation increased viewing time and self-reported outcomes in study 1. Study 1 showed gender differences whereby self- and other-affirmation effects were stronger in males and other affirmation scores on all self-reported outcomes exceeded the control in females. In Study 1, effects of other-affirmation were greater in individuals scoring higher in denial, but this was not so of Study 2. Study 1 also showed that other affirmation effects were partly mediated by a measure of other-affirmation, independently of self-affirmation.

We initially argued that self and other-affirmations constitute different ways of achieving similar adaptive responses to threat. Self-affirmation theory states that affirmation bolsters self-integrity by allowing participants to view threats within a perspective of an enhanced self, better allowing the identification of personal coping resources (Critcher, et al., 2015; Crocker, Niiya & Mischkowski, 2008). We designed the other-affirmation intervention to increase other-integrity by creating a sense of shared values, thus encouraging participants to also take a broad, but more explicitly social perspective. Both studies showed that other-affirmation increases message effects on outcomes associated with future behavioural changes. Study 1 showed the other-affirmation effect to be mediated by an other-affirmation scale that measured positive perceptions of others and their values. This mediation was independent from self-affirmation effects, suggesting that other-affirmation is probably not merely a different way of facilitating self-affirmation effects.

We have not tested mediating variables, such as connectedness or self-transcendence. Thus, the mechanism by which other-affirmation works is unknown. Further, we would need to eliminate the possibility that the effect is mediated by inferences that people draw from the

perception that others share their values rather than the perception of shared values itself. For example, Study 1 participants might infer that others who share their values would provide kindness in terms of practical support to them in times of need (Cohen, S. & Janicki-Deverts, 2009). An important direction for future research is to isolate mechanisms of the other-affirmation effect.

It is unclear why less clear-cut intervention effects, particularly in viewing times, were obtained in Study 2. One possibility is that the design of Study 2 addressed the key confound in Study 1; the confounding of value elicitation with expectations that others will be kind to the participant. However, we do not fully endorse this explanation. It would presumably be more applicable to other-affirmation and, thus, does not convincingly explain why self-affirmation effects were also attenuated. Another explanation is that the kindness questionnaire asked participants to think about specific acts of kindness whilst the values manipulation in Study 2 asked them to think about value importance. We speculate that affirmation effects may be greater when people think about enactments of values (Study 1) rather than merely whether and how others may hold them (Study 2).

It is interesting that we did not find any self-affirmation effects in Study 2. There is at least one precedent for failure to find value elicitation effects in alcohol research with students (Knight & Norman, 2016). The values that we elicited may have contributed to this. We provided a list of transcendent values for participants to consider, although they were also permitted to nominate values of their own. Whilst potentially favouring other-affirmation, this may have inhibited affirmation effects in participants who might otherwise wanted to think about self-enhancement values, although it is not clear whether this would also explain why other-affirmation effects were also smaller.

Epton et al (2015) did not find evidence of gender differences in self-affirmation effects, but Study 1 showed other-affirmation effects on self-reported outcomes to be stronger

in females. Females are more likely to hold transcendent values (Coward, 1996), and show stronger collective and weaker individualistic social orientations than males (Gibbons & Buunk, 1999; Wang, 2013). As self-affirmation effects appear to be gender neutral, other-affirmation might be effectively used to target female audiences.

The advantages of other-affirmation as an adjunct to persuasive health promotion messages could lie in two areas. First, Study 1 shows that other-affirmation induction is, at least partly, independent of self-affirmation. As such, it may influence specific populations, such as females, or specific behaviours such as alcohol use, that can be resistant to self-affirmation manipulations (Knight & Norman, 2016). Research is required to establish conditions under which other affirmation might be advantageous. An early hypothesis might be that other affirmation will be more effective than self-affirmation amongst people who hold transcendent values.

Second, other-affirmation seems, in some ways, to be better suited to mass-reach media than self-affirmation. Self-affirmation requires supervised and reasonably elaborate manipulations that may be difficult to use in health promotion campaigns. Conversely, affirmations of the values of others, such as kindness, seem relatively easy to weave into health promotion messages. In this, we do not mean that our manipulation can be easily replicated in a mass-reach format, but that other-affirmation effects could potentially be achieved by presenting images and storylines portraying interpersonal interactions where important values are actively demonstrated.

Further work is required to reinforce and extend these findings. First, we did not specify the identity of others in the other-affirmation condition. Thus it is not clear whether other affirmation effects are stronger in partners, peers, ingroups, friends, family or generic others. This is an important theoretical as well as practical point. Attachment and social support theories generally focus on relationships with specifically important others (Mikulincer & Shaver, 2010), although

20

more recent work also emphasises the role of attachments to wider social and institutional figures (Lilliehorn, Hamberg, Kero & Salander, 2010). Second, our sample was not population representative. Findings should be generalised with caution, and further work conducted in non-student populations. Students drink more than their non-student peers and show defensive responses to anti-alcohol messages but cannot be taken as representative of all young people. A third limitation is that we measured self-reported outcomes rather than behavioural change. Similarly, the effect should be demonstrated in other health behaviours. Psychological changes predict behavioural change, but do so imperfectly (Webb & Sheeran, 2006).

Nonetheless, our other-affirmation manipulation was as effective as self-affirmation in augmenting a threatening persuasive message, and in Study 2 showed the only effect. Other-affirmation can be easily implemented and Study 1 suggests that it may suit females. It is unclear why the Study 2 effect size was smaller than Study 1, and it is important to identify the best ways of inducing other affirmation effects. It is also important to establish whether other-affirmation facilitates actual behavioural changes. Finally, delineation of psychological processes, such as connectedness, by which other-affirmation might affect change is needed.

Conflict of Interest: All authors assert that they have no conflicts of interest.

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Table 1. Means, Standard Deviations (in parentheses) and Intercorrelations of Variables

.	Mean (SD)	2	3	4	5	6	7
Study 1							
1. Age	19.29 (1.72)	-.03	-.04	.03	-.05	.00	-.05
2. AUDIT	7.26 (3.04)		.15**	.04	.03	.00	.52**
3. Denial	1.58 (0.67)			.09	.18**	.14*	.27**
4. Time	277.73 (85.78)				.10	.18**	.19**
5. Intention	3.63 (1.64)					.49**	.40**
6. Evaluation	5.10 (1.06)						.45**
7. Risk	2.64 (1.30)						
Study 2							
1. Age	19.92 (1.79)	-.09	.08	-.05	-.17*	-.03	-.06
2. AUDIT	5.72 (2.55)		.19**	.10	-.05	.05	.41**
3. Mental Disengagement	2.25 (0.54)			-.12	-.02	.02	.11
4. Exposure Time	270.02 (95.97)				.15*	.14	.14
5. Intention	3.79 (1.52)					.38**	.46**
6. Evaluation	5.30 (0.85)						.49**
7. Risk	2.84 (1.16)						

*p<.05, **p<.01

Table 2. Means and Standard Deviations (in parentheses) of Viewing Time and Self-Reported Outcomes by Condition and Gender. Superscript denotes group differences after post hoc Bonferroni testing.

		Self Affirmation	Other Affirmation	Control	
Study 1					
Exposure Time	Male	299.06 (11.11)[a]	309.33 (10.71)[a]	255.38 (10.35)[b]	Cond F=8.95, p<.01, η_p^2=.060
	Female	285.42 (14.07)	283.81 (13.29)	271.71 (13.12)	Cond X Gender F=5.44, p<.01, η_p^2=.04
Intention	Male	4.19 (1.67)[a]	3.47 (1.61)	3.17 (1.66)[b]	Cond F=7.16, p<.01, η_p^2=.050
	Female	3.80 (1.55)	4.20 (1.55)[a]	3.13 (1.61)[b]	Cond X Gender F=2.80, p=.062, η_p^2=.020
Evaluation	Male	5.26 (0.92)	5.19 (1.07)	4.88 (1.16)	Cond F=6.09, p<.01, η_p^2=.043
	Female	5.03 (0.97)	5.49[a] (0.79)	4.74 (1.24)[b]	Cond X Gender F=1.64, p=.196, η_p^2=.022
Risk	Male	3.20 (1.39)[a]	2.80 (1.46)	2.50 (1.18)[b]	Cond F=5.33, p<.01, η_p^2=.037
	Female	2.42 (1.25)	2.70 (1.11)[a]	2.42 (1.24)[b]	Cond X Gender F=1.53, p=.219, η_p^2=.011
Study 2					
Exposure Time	Full Sample	276.69 (105.25)	263.92 (86.35)	256.33 (97.60)	Cond F=0.71, p=.495, η=.007
Intention	Full Sample	3.82 (1.66)	3.99 (1.20)	3.52 (1.47)	Cond F=1.50, p=.227, η^2=.015
Evaluation	Full Sample	5.21 (0.86)	5.51 (1.07)[a]	5.09 (0.88)[b]	Cond F=4.26, p<.05, η^2=.034

Risk	Full Sample	2.66 (1.14)	3.11 (1.02)	2.76 (1.19)	Cond F=2.85, p=.060, η^2=.029

Table 3. Moderation Analyses Testing Independent Moderation of Affirmation Effects on Viewing Time and Self-Reported Outcomes by Denial and AUDIT Scores. Figures are unstandardised beta estimates with 95% confidence intervals.

	Self-Affirmation	Other-Affirmation	Self-Affirmation	Other-Affirmation
Study 1	Viewing Time		Self-Reported Outcomes	
Affirmation	23.79 48.23 72.67	9.24 53.07 276.90	.26 .52 .78	.25 .51 .76
AUDIT	-3.59 0.47 4.53	-3.24 0.66 4.57	.05 .10 .14	.01 .05 .09
Denial	-16.41 3.25 22.91	-15.24 4.23 23.84	.08 .13 -.34	-.17 .03 .25
Affirm*AUDIT	-4.03 4.20 12.42	-3.45 4.39 12.22	-.05 .03 .12	-.16 -.07 .01
Affirm*Denial	-19.23 19.48 58.20	-18.24 20.65 59.53	.53 .95 1.36	.29 .71 1.13
Study 2	Viewing Time		Self-Reported Outcomes	
Affirmation	-17.30 18.33 53.96	-25.84 5.87 37.58	-.16 .21 .57	.13 .46 .80
AUDIT	-1.03 6.20 13.42	1.01 8.02 15.03	-.06 .01 .08	-.11 -.03 .04
Mental Disengagement	-15.60 -7.5 .5983	-16.54 -9.40 -2.26	-.10 -.02 .06	-.05 .03 .10
Affirm*AUDIT	-21.23 -6.60 8.03	-17.18 -3.10 10.98	-.06 .09 .23	-.14 .00 .15
Affirm* Mental Disengage.	-0.66 15.60 31.85	-2.48 11.88 26.20	-.23 -.07 .10	-.12 .03 .18

*p<.05, **p<.01

Table 4. Bootstrapping Estimates with 95% Confidence Intervals of Indirect Effects of Affirmation on Viewing Time and Persuasivenes (Study 1)

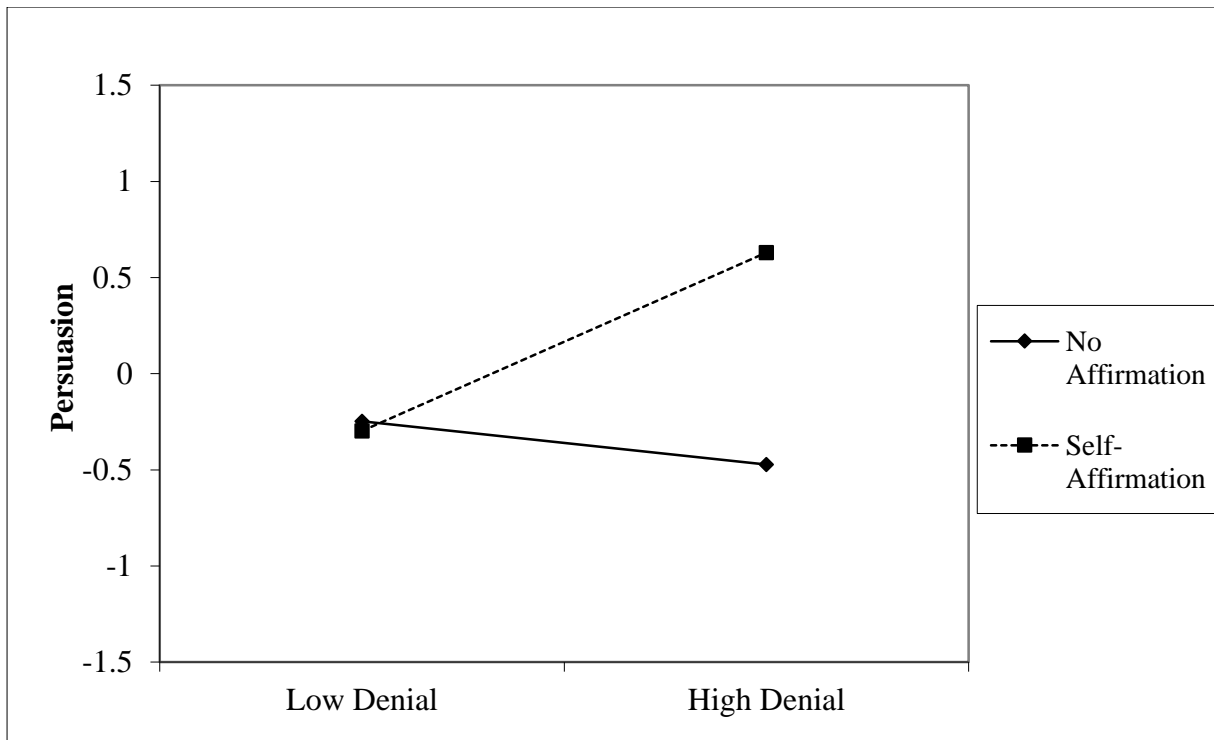|	Overall Indirect Effect	Indirect effect for Self-Affirmation	Indirect effect for Other-Affirmation
Self-Aff./ Viewing Time	0.04 6.76 18.06	-.042 7.87 22.58	-9.63 -1.19 3.10
Self-Aff./ Self-Reported Outcomes	0.02 0.21 0.39	0.03 0.19 0.39	-0.02 0.01 0.10
Other-Aff/ Viewing Time	-2.63 8.17 21.23	-0.62 6.22 17.37	-8.30 1.96 13.85
Other-Aff./ Self-Reported Outcomes	0.08 0.20 0.38	-0.01 0.05 0.21	0.03 0.15 0.36

*p<.05

Figure 1a. Interaction of Self-Affirmation and Denial in Predicting Persuasion (Study 1)
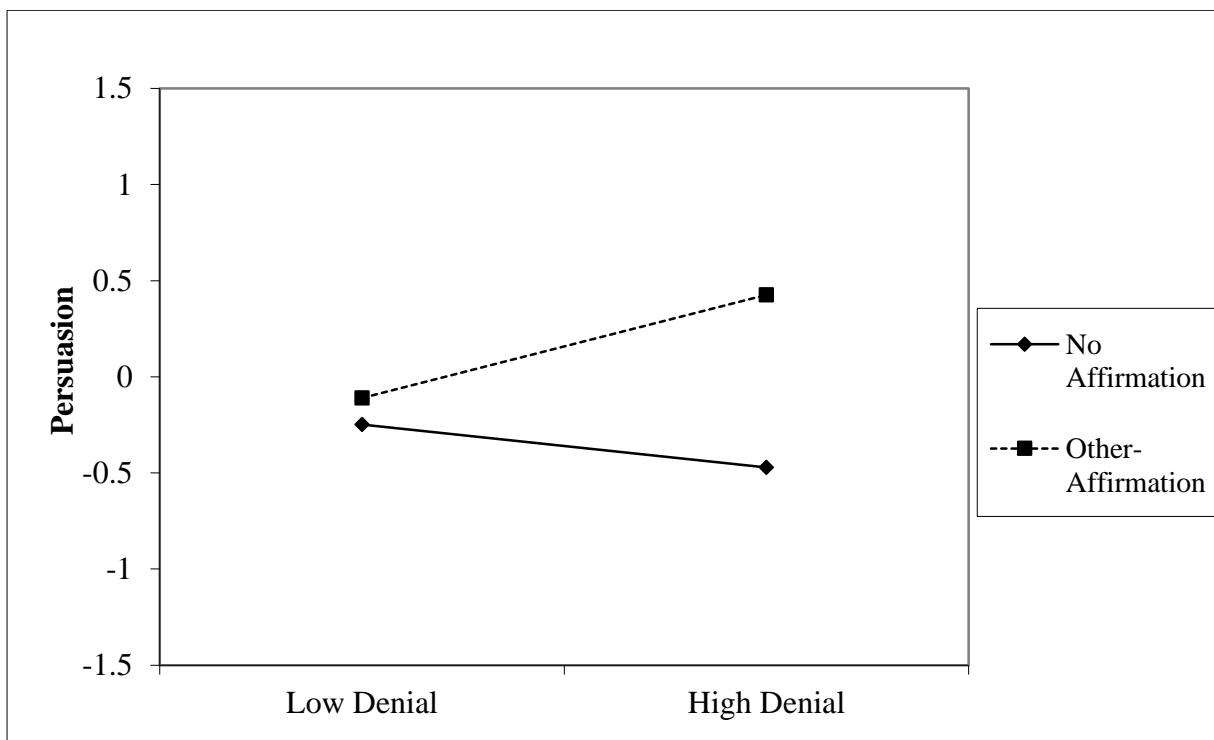

Figure 1b. Interaction of Other-Affirmation and Denial in Predicting Persuasion (Study 1)