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Am I a responsible drinker? The impact of message frame and drinker prototypes on perceptions of alcohol product information labels

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ABSTRACT

Background: Current alcohol product labelling tends to include ambiguous messages such as 'drink responsibly'. Consumers who identify as responsible drinkers may not pay heed to health warning messages, believing that they are not the intended target.

Aims: We aimed to determine how responses to responsible drinking labels would differ from responses to positively and negatively framed health messages. We also explored if prototype perceptions would moderate the message impact.

Methods: A between groups, three arm (ambiguous, positive or negative messages) experiment recruited 465 participants. Outcomes were drinking intentions and label acceptability (novelty, believability, personal relevance, and potential to change behaviour). Measures of heavy and responsible drinker prototype perceptions were included for exploratory moderation analyses.

Results: Positive and negative messages were rated significantly more likely to change behaviour than ambiguous messages. There was also a moderation effect: participants with stronger favourability and similarity to the responsible drinker prototype intended to drink more alcohol in the future after exposure to negatively framed labels, but not after exposure to ambiguous or positively framed labels.

Discussion: 'Drink responsibly' messages are unlikely to lead to behaviour change. Incorporating theoretical moderators may have value in developing our understanding of the impact of alcohol product labelling.

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Alcohol labels; alcohol packaging; prototypes; message framing; responsible drinking

Introduction

Alcohol is widely consumed for its pleasurable short-term effects (Measham, 2004) however it is implicated in a large share of death and disability around the world (GBD 2016 Alcohol Collaborators, 2018; Rehm & Shield, 2013). Strategies to reduce

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this burden include legislative changes to reduce alcohol outlet density, minimum unit pricing, taxation, restriction of sales to minors, public health campaigns, and the inclusion of health information on product labels (Burton et al., 2017). Evidence from the field of tobacco research has shown that warning messages on products can impact people's knowledge of health risks, and encourage them to consider quitting smoking (Hammond et al., 2006). Such evidence has led to a body of research aimed at understanding whether similar impacts can be demonstrated for alcohol.

The use of alcohol health warning labels appears to have support from the public (Maynard et al., 2018) and may be able to increase awareness of the risks of drinking (Wilkinson & Room, 2009). Experimental research has suggested that specific, negatively framed health messages (e.g. 'alcohol increases your risks'), which emphasise long term health effects, may have an impact on drinking behaviours (Blackwell et al., 2021). In particular, negatively worded messages about the links between alcohol and cancer were shown to be more effective than comparable but positively worded messages (e.g. 'drinking less alcohol reduces your risks') or messages related to mental health (Blackwell et al., 2018). In contrast, other studies suggest people might prefer positively worded messages (Pettigrew et al., 2014), although caution is needed because positively worded messages may actually lead to increases in consumption (Jarvis & Pettigrew, 2013).

However, at present, the adoption of a voluntary code of standards and self-regulation of the alcohol industry in many countries, including the UK, means that specific health information, other than reminders to avoid alcohol while pregnant, is not included on labels (Farke, 2011). Instead, the following kinds of messages are widely used on labels—'enjoy responsibly', 'drink responsibly' and 'know your limits' (Maani Hessari & Pettigrew, 2018).

Using an analysis of 101 publically available alcohol industry documents, Maani Hessari and Pettigrew (2018) concluded that the term 'responsible drinking' lacked a clear, consistent definition. Responsible drinking was not related to low risk drinking guidelines, instead, it was sometimes linked with discouraging drink-driving, underage drinking, or with unspecified levels of excessive drinking (Maani Hessari & Pettigrew, 2018). It thus seems to be an example of strategic ambiguity which can serve to subtly advance sales and public relations interests (Smith et al., 2006), putting the onus on the consumer to set their own limits, and be accountable for adverse consequences.

Nevertheless, consumers are critical of these ambiguous messages, believing the alcohol industry to be doing the bare minimum (Jones et al., 2021). The concept of responsible drinking is interpreted as ambiguous, and may mean drinking without unwanted consequences (Stautz & Marteau, 2016), or being in control of one's actions (Roznowski & Eckert, 2006). A study of UK drinkers found they perceived their own behaviour when drinking as more controlled than other people's (Davies et al., 2018). If a person's drinking has not caused unwanted outcomes they believe themselves to be in control, perhaps this signals they are a 'responsible drinker', regardless of how much they drink. To our knowledge, it appears that few studies include responsible drinking labels as a comparator to positive or negatively framed labels about health risks. Doing so would provide important information about the potential benefits of using health warnings on labels.

In the wider field of behaviour change, moderators of intervention effects are under researched, leaving gaps in our knowledge about the conditions in which

specific intervention strategies will be effective (Rothman & Sheeran, 2021). An additional gap in the alcohol labelling literature relates to the dearth of theoretically driven research (Hassan & Shiu, 2018). This means that potential moderators of the relationship between message content and message impact are yet to be understood. This is particularly important because previous studies have identified that personal relevance is an important predictor of message impact, regardless of message frame or content (Pettigrew et al., 2016; Winstock et al., 2020). One specific aspect of personal relevance was therefore explored in this study: the extent to which people identify with drinker prototypes.

Prototype perceptions are a key component in the Prototype Willingness Model (PWM; Gerrard et al., 2008). This theory extends some of the commonly applied reasoned action approaches, such as the Theory of Planned Behaviour, which propose that a combination of attitudes and norms are precursors to intentions, which in turn predict behaviour. In the PWM an additional social reaction pathway to behaviour is proposed, which accounts for the non-deliberative, unplanned nature of risk behaviours that often occur in social situations. This pathway proposes that prototype perceptions will influence an individual's willingness to undertake a risk behaviour, and that willingness directly influences behaviour.

Prototypes are assumed to be highly distinctive images of a certain 'type' of person, and they may have positive and negative characteristics associated with them. For example, adolescents often have a clear idea about the typical person their age that drinks, and might describe this typical person as self-confident, popular, attractive, or careless. The extent to which people identify with social images, or 'prototypes', of different types of drinkers, has been shown to directly predict drinking intentions and drinking behaviours (Davies & Todd, 2021; Gerrard et al., 2002; Todd et al., 2016).

Similarity to a heavy drinker prototype is associated with increased levels of consumption (Davies, 2019; Gerrard et al., 2002). Even people who drink large amounts of alcohol do not identify with 'heavy drinker' prototypes (van Lettow et al., 2015), or as 'problem drinkers' (de Visser et al., 2013). Thus, (objectively) heavy drinkers who identify themselves as the 'responsible drinker' alluded to in responsible drinking messages might discount warning messages on alcohol packaging on the basis that they believe that they are not the intended audience. Exploring the extent to which individuals identify as 'responsible' or 'heavy' drinkers could provide a useful way of understanding how people reflect on the relevance of alcohol health messages.

The purpose of the current study was to examine responses to ambiguously worded 'responsible drinking' messages in comparison to positively and negatively framed health messages, and to explore whether prototype perceptions would moderate the impact of such messages on drinking intentions. While drinking intentions do not always directly relate to drinking behaviours (Sheeran & Webb, 2016), measuring intentions is recognised as a useful proxy for behaviour as they are strongly correlated (Cooke et al., 2016). Alongside personal relevance, novelty and believability of health information messages have been found to predict their effectiveness and it is important to understand potential for behaviour change (Winstock et al., 2020). Believability is a component of perceived message credibility (Appelman & Sundar, 2016). Greater credibility is associated with larger reductions in alcohol consumption after viewing messages linking alcohol consumption and breast cancer (Harris et al., 2009). However,

Byrne et al. (2012) found that perceived credibility did not impact the perceived effectiveness of smoking cessation advertisements when the content was direct and explicit. As such, while the ambiguous messages may be more believable, the direct, explicit content of the positively and negatively framed messages may be more likely to prompt behaviour change.

In summary, this study firstly aimed to determine if there were differences in the way that positively framed, negatively framed and ambiguous messages presented on alcohol labels impacted on a) drinking intentions, b) perceptions of the labels (novelty, believability, relevance, and likelihood of prompting behaviour change). We hypothesised that positive and negative messages would lead to lower ratings of intentions to drink compared to ambiguous messages, and that they would be more novel and more likely to prompt behaviour change. We also hypothesised that ambiguous messages would be more relevant and believable than positive and negative messages.

Secondly, the study aimed to explore whether individual differences in prototype perceptions would moderate the effect of these messages on drinking intentions. We predicted that higher ratings of favourability and similarity to a responsible drinker would moderate the impact of message type on drinking intentions, specifically that this would result in higher drinking intentions for ambiguous messages compared to positive and negative messages. In other words, seeing oneself as a responsible drinker may mean that responsible drinking messages are ignored, but more specific health messages will have an impact. Similarly, we predicted that higher ratings of favourability and similarity to a heavy drinker would result in higher drinking intentions for the ambiguous messages compared to positive and negative messages. While this prediction is in a similar direction, it may be that recognising oneself as a heavy drinker means that health messages seem more relevant.

Methods

Design

A between groups three arm experiment was conducted online from two universities in City 1 and City 2. Data from University 1 were collected from March-June 2019 and from University 2 from November 2020 – January 2021. The study received approval from Research Ethics Committees at Oxford Brookes University and the University of Sheffield. The study protocol was pre-registered on the Open Science Framework at osf.io/4s73w.

Procedure

The experiment was delivered online using Qualtrics. Participants read an information sheet and provided their consent before completing the following measures:

Demographic information: Participants were asked about their gender, age, ethnicity and occupation.

Alcohol consumption was measured using the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001), which is a tool to assess consumption and harmful consequences of drinking. AUDIT responses generate a total score of 0–40 which is

further categorised as lower risk of dependence (0–7), increasing risk (8–15), higher risk (16–19) and possible dependence (20+).

Prototype perceptions: In line with previous research respondents were presented with a description at the start of the section:

The following questions concern your images of people. What we are interested in here are your ideas about typical members of different groups. For example, we all have ideas about what typical celebrities are like or what the typical teacher is like. When asked, we could describe one of these images – we might say that the typical celebrity is attractive or rich, or that the typical teacher is strict or clever. We are not saying that all celebrities or all teachers are exactly alike, but rather that many of them share certain features (Gibbons et al., 1995).

They rated how favourable (1 =extremely negative; 7=extremely positive) and how similar they were (1= not at all; 7=very) to a typical heavy drinker and typical responsible drinker of the same age as themselves. Thus there were four single items – two for the responsible drinker prototype (favourability and similarity) and two for the heavy drinker prototype (favourability and similarity). In line with previous studies, we did not define the two prototypes, but asked respondents to imagine the type of person who they would describe as a heavy/responsible drinker and then to rate them (Davies, 2019).

After completing these measures, participants were randomised in Qualtrics to one of three conditions; positively framed, negatively framed, or ambiguously worded alcohol product labels (See [Figure 1](#)). Positively framed labels focused on the benefits of drinking less, whereas negatively framed labels focused on the risks of drinking. Efforts were made to ensure that labels were of a similar length. In the positive and negative condition, the labels presented information about alcohol and the risk of seven types of cancer (e.g. positive = ‘drinking less reduces your risks of getting seven types of cancer’; negative = ‘alcohol increases your risks of getting seven types of cancer’); liver disease, and heart disease. In the ambiguous condition, the labels presented information about drinking responsibly, staying in control of your drinking, and knowing your limits (See [Figure 1](#) for wording labels).

At the start of the section, all three messages from each condition were presented together in large font with a black and white outline of glasses and bottles behind them. On the following pages, the messages were presented separately together with the four message perception items based on previous studies (Winstock et al., 2020). Scores were averaged across the three labels to create a composite score. This approach to composite scoring is appropriate for categorical variables when the composite score creates a meaningful grouping (Song et al., 2013); i.e. when higher scores will indicate a higher level of novelty.

Novelty: Participants were first asked if the information on the label was new to them (yes = 1; no = 2). To aid interpretation this variable was reverse scored. Thus, a higher average score for all three labels indicated labels were more novel.

Believability: Secondly they were asked if they believed the information on the label (yes =1; unsure = 2; no = 3). To aid interpretation this variable was reverse scored. Thus a higher score for all three labels indicated the labels were more believable.

Personal relevance: Thirdly, they were asked if the information on the label was personally relevant to them (1-totally irrelevant, 2, - not very relevant, 3 –unsure, 4- a

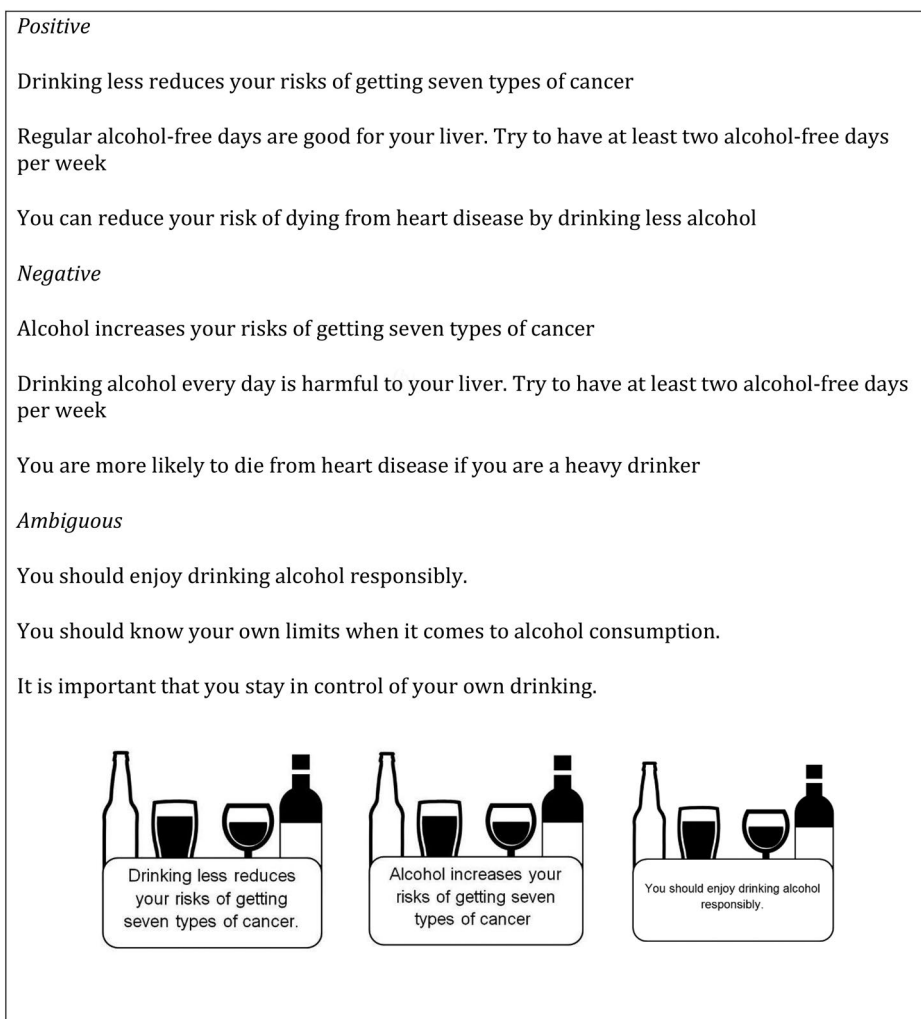


Figure 1. Messages presented on the alcohol labels in each condition.

bit relevant and – 5 very relevant). Thus a higher score indicated that the labels were more relevant.

Behaviour change: Fourthly, they were asked if the information on the label would make them consider drinking less (1 = no; 2 = unsure; 3 = maybe; 4 = yes). Thus, a higher score indicated the label was more likely to prompt behaviour change.

Two attention check questions were included in the version of the survey implemented at University 2. Respondents who failed to answer both of these items correctly were removed from the data set (N = 26).

Primary outcome measures

After having viewed all three labels and considered the four measures above, participants completed the primary outcome measures of drinking intentions, which were measured in two ways:

Future drinking intentions: Intentions to drink in the next week were measured in line with previous research on alcohol labelling (Pettigrew et al., 2016) and measuring drinking intentions (Francis et al., 2004). Participants were asked 'to what extent do you intend to do the following in the next week?' a) have an alcoholic drink and b) get drunk (from 1 = 'definitely do not intend to do this' to 7 = 'definitely intend to do this'). The items were averaged so that a higher score indicated greater intentions to drink.

Beliefs about reducing drinking: Participants were asked (a) 'to what extent do you believe you should reduce the amount of alcohol you consume?' and (b) 'to what extent do you think you will actually reduce the amount of alcohol you consume?' (from 1 = not at all to 7 = to a great extent). The items were averaged so that a higher score indicated greater intentions to reduce drinking.

To create a composite measure of intentions, the beliefs about reducing drinking items were reverse scored so that overall, a higher score on the composite measure indicated greater intentions to drink alcohol.

Participants

People aged 18 and over who self-reported consuming alcohol at least once a week were recruited to take part in the study. Using GPower the required sample size for a three group design was calculated as 156, using an alpha level of 0.05 and power of .9 to detect a medium effect size (.25) based on the main outcome measures of drinking intentions. The study was not originally powered to detect differences in the message perception measures (novelty, believability, relevance or behaviour change) or the moderation effects, so these were treated as exploratory. Once data collection was completed at University 1, we decided to increase the power of the study by undertaking recruitment at University 2.

At University 1, participants were recruited via a university electronic notice board, social media and an online local news page and had the option of being entered into a prize draw to win £100 Love to Shop Vouchers as a thank you for taking part. At University 2 they were recruited via social media and an undergraduate psychology participant panel, but there was no prize draw. The University 2 version of the study was identical to the University 1 version other than the inclusion of two attention check questions (described above).

Analyses

Means and standard deviations were used to explore the intention and label acceptability measures. The number and percentage of respondents who indicated that each individual label was novel, believed, a bit or very personally relevant, and would make them consider changing their behaviour were compared. All main outcome measures were slightly positively skewed in distribution but homogeneity of variances was met. Thus, due to the relatively large sample size and robustness of the test against violations of normality (Fagerland, 2012), one way ANOVAs were used to test for differences between the conditions. Alpha levels were adjusted for multiple comparisons. Post-hoc tests with Bonferroni comparisons were used to explore significant results.

Exploratory moderation analyses were conducted using the PROCESS macro in SPSS (Hayes, 2012). The PROCESS tool allows categorical variables to be entered as predictors (X) and specified as such, creating two interaction terms within each model. Thus, condition was entered as the predictor (X) for each model. In all analyses, the positive label condition was the reference category to compare the negative and ambiguous condition to in order to compare the health messages to each other as well as compare negative messages to positive as in previous research (Blackwell et al., 2018). Prototype perception variables (favourability and similarity of the heavy and responsible drinker prototypes) were centred and entered as moderators (W), and the composite intentions measure was entered as the outcome (Y). When significant interaction terms were found, the moderation effect was explored graphically.

Results

Sample

Overall, 465 participants completed the study (71.2% women; 28.6% men; 0.2% did not disclose gender). University 1 recruited 189 participants and University 2 recruited 276. The mean age of the sample was 31.81 (SD = 14.96; range 18–75 years). AUDIT score was highly reliable (10 items; $\alpha=.87$). Of the sample, 24.9% scored 0–7 and were categorised as low risk drinkers, 46% scored 8–15 (increasing risk), 18.9% scored 16–19 (higher risk) and 10.1% scored 20+ (possible dependence). AUDIT scores did not differ across respondents in the three conditions ($F(2,462)=.862, p=.423$).

Descriptive statistics

Label perceptions acceptability ratings

Table 2 includes data for each individual label for awareness, believability, relevance, and whether each individual label would make participants consider drinking less. Cancer messages were rated as the newest information (47.1% in the positive and 57.4% in the negative condition), and rated the lowest for believability (72.3% in the positive and 71.6% in the negative condition). Liver messages were the most believed in the positive (91.6%) and negative (92.2%) conditions.

Table 1. Sample characteristics including AUDIT scores and prototype perceptions by condition.

Condition	Positive (N= 155)	Negative (N= 155)	Ambiguous (N= 155)	Total N= 465
Woman N (%)	106 (68.4)	119 (76.8)	106 (68.4)	331 (71.2)
Man N (%)	49 (31.6)	35 (22.6)	49 (31.6)	133 (28.6)
Non-binary N (%)	–	1 (0.6)	–	1 (0.2)
Age: Mean (SD)	31.8 (14.9)	31.9 (14.8)	32.1 (16.3)	31.92 (15.31)
White ethnicity N (%)	140 (90.3)	143 (92.3)	148 (95.5)	431 (92.7)
Employed N (%)	77 (49.7)	82 (52.9)	69 (44.5)	228 (49.1)
Student N (%)	71 (45.8)	67 (43.2)	81 (52.3)	219 (47.2)
AUDIT score: Mean (SD)	11.95 (5.95)	12.66 (6.52)	11.83 (5.73)	12.15 (6.07)
Heavy drinker favourability	3.73 (1.30)	3.78 (1.34)	3.80 (1.50)	3.77 (1.38)
Heavy drinker similarity	2.75 (1.56)	2.99 (1.74)	2.75 (1.55)	2.83 (1.62)
Responsible drinker favourability	5.49 (1.19)	5.46 (1.17)	5.47 (1.20)	5.48 (1.18)
Responsible drinker similarity	4.76 (1.56)	4.69 (1.48)	4.84 (1.49)	4.76 (1.51)

Table 2. Perceptions of each label in the study in terms of awareness, believability, relevance, and whether each individual label would make participants consider drinking less.

	Novelty (N % New)	Believability (N % Yes)	Relevance (N % A bit or very relevant)	Drink Less (N % Yes or maybe)
Positive cancer	73 (47.1%)	112 (72.3%)	84 (54.2%)	88 (56.8%)
Positive liver	35 (22.6%)	142 (91.6%)	86 (55.5%)	83 (53.5%)
Positive heart	25 (16.1%)	136 (87.7%)	73 (47.1%)	73 (47.1%)
Negative cancer	89 (57.4%)	111 (71.6%)	78 (50.3%)	79 (51%)
Negative liver	21 (13.6%)	142 (92.2%)	61 (39.4%)	71 (45.8%)
Negative heart	37 (23.9%)	135 (87.1%)	53 (34.2%)	64 (41.3%)
Ambiguous enjoy responsibly	15 (9.7%)	137 (88.4%)	93 (60%)	34 (21.9%)
Ambiguous limits	22 (14.3%)	128 (83.1%)	96 (62.3%)	47 (30.5%)
Ambiguous control	31 (20%)	146 (94.2%)	90 (58.4%)	51 (33.1%)

Table 3. Comparison of study outcome measures by condition with ANOVA test statistics and p-values.

Outcome measure M (SD)	Positive	Negative	Ambiguous	F value, p value, eta-squared
Future drinking intentions	3.90 (1.68)	3.85 (1.81)	3.80 (1.63)	F = 0.13, p = .882, $\eta^2 = .001$
Beliefs about reducing drinking	4.99 (1.52) ^a	5.15 (1.38) ^{a, b}	5.39 (1.39) ^b	F = 3.06, p = .048 ¥, $\eta^2 = .013$
Composite drinking intentions	4.44 (1.00)	4.50 (1.10)	4.60 (1.05)	F = 0.97, p = .380, $\eta^2 = .004$
Novelty	1.29 (0.29)^a	1.32 (0.28)^a	1.15 (0.24)^b	F = 16.89, p < .001, $\eta^2 = .068$
Believability	2.83 (0.26)	2.81 (0.30)	2.84 (0.32)	F = 0.46, p = 0.633, $\eta^2 = .002$
Personal relevance	3.26 (1.04)^a	2.90 (1.13)^b	3.42 (1.10)^{a, b}	F = 9.04, p < .001, $\eta^2 = .038$
Behaviour change	2.24 (0.95)^a	2.16 (1.02)^a	1.74 (0.83)^b	F = 16.86, p < .001, $\eta^2 = .068$

Notes:.

¥ = p value does not meet the threshold of $p < .007$ taking into account multiple comparisons therefore post-hoc tests included for information only.

Different superscript letters denote categories that were significantly different from each other in post hoc tests using Bonferroni corrections.

The effect of condition on drinking intentions and message perceptions

There were significant differences between the conditions in terms of novelty ($F = 16.89, p < .001, \eta^2 = .068$), personal relevance ($F = 9.04, p < .001, \eta^2 = .038$) and behaviour change ($F = 16.86, p < .001, \eta^2 = .068$) with small to medium effect sizes (Table 3). Labels in the positive and negative framing conditions were significantly more novel than those in the ambiguous condition. Labels in the negative framing condition were rated as significantly less relevant than either the positive or ambiguous labels. Finally, labels in the ambiguous condition were rated as significantly less likely to change behaviour compared to those in either the positive or negative conditions. There were no significant differences between the conditions in terms of future drinking intentions, beliefs about reducing drinking, or the composite measure of intentions. The test statistic for the ANOVA on beliefs about reducing drinking did not meet the threshold level of $p < .007$ taking into account the seven comparisons being made, but post-hoc tests results are reported for this analysis.

Table 4. Results of four moderation models exploring whether prototype perceptions moderated the impact of condition on drinking intentions with positive messages as the reference group.

	Coefficient	SE	t	p	Lower CI	Upper CI
<i>Heavy drinker favourability</i>						
Constant	4.4350	.0845	52.4940	.0000	4.2690	4.6011
Negative	.0625	.1189	.5254	.5996	-.1711	.2961
Ambiguous	.1644	.1191	1.3810	.1679	-.0696	.3984
Heavy drinker favourability	.0928	.0653	1.4213	.1559	-.0355	.2210
Negative X Heavy drinker favourability	.1052	.0904	1.1634	.2453	-.0725	.2829
Ambiguous X Heavy drinker favourability	-.0016	.0860	-.0189	.9849	-.1707	.1675
<i>Heavy drinker similarity</i>						
Constant	4.4402	.0852	52.1026	.0000	4.2727	4.6077
Negative	.0449	.1201	.3737	.7088	-.1911	.2808
Ambiguous	.1487	.1205	1.2342	.2178	-.0881	.3854
Heavy drinker similarity	.0997	.0550	1.8123	.0706	-.0084	.2078
Negative X Heavy drinker similarity	-.0047	.0734	-.0645	.9486	-.1490	.1395
Ambiguous X Heavy drinker similarity	-.0985	.0779	-1.2638	.2069	-.2516	.0546
<i>Responsible drinker favourability</i>						
Constant	4.4376	.0848	52.3329	.0000	4.2710	4.6043
Negative	.0645	.1195	.5394	.5899	-.1704	.2994
Ambiguous	.1692	.1199	1.4109	.1589	-.0665	-.0665
<i>Responsible drinker favourability</i>						
Negative X Responsible drinker favourability	.2664	.1015	2.6232	.0090	.0668	.4659
Ambiguous X Responsible drinker favourability	.1925	.1006	1.9124	.0565	-.0053	.3902
<i>Responsible drinker similarity</i>						
Constant	4.4341	.0851	52.1112	.0000	4.2669	4.6013
Negative	.0697	.1200	.5811	.5614	-.1661	.3056
Ambiguous	.1730	.1204	1.4370	.1514	-.0636	.4096
Responsible drinker similarity	-.1005	.0547	-1.8378	.0668	-.2079	.0070
Negative X Responsible drinker similarity	.1580	.0791	1.9974	.0464	.0025	.3134
Ambiguous X Responsible drinker similarity	.0880	.0791	1.1130	.2663	-.0674	.2434

Exploratory moderation analyses

Exploratory moderation analyses (see Table 4) were conducted using heavy drinker favourability, heavy drinker similarity, responsible drinker favourability and responsible drinker similarity as moderators, condition as the predictor and composite intentions as the outcome variable to improve statistical power compared to examining either component alone (Song et al., 2013). Neither heavy drinker prototype favourability, nor heavy drinker prototype similarity were a significant moderator of the impact of condition on drinking intentions.

However, both responsible drinker prototype favourability and similarity were significant moderators of the impact of label condition on drinking intentions. Figure 2 shows the interaction between responsible drinker favourability and condition. Specifically, in the negative condition compared to the positive condition, a lower level of responsible drinker favourability was associated with lower intentions to drink, but as favourability of the responsible drinker increased, drinking intentions also increased ($p=.009$), with the opposite effect observed in the positive condition. Figure 3 shows the interaction between responsible drinker similarity and condition was in the same direction as for responsible drinker favourability ($p=.046$). This effect was not observed in the ambiguous condition compared to the positive condition for either responsible favourability ($p=.057$) or similarity ($p=.266$).

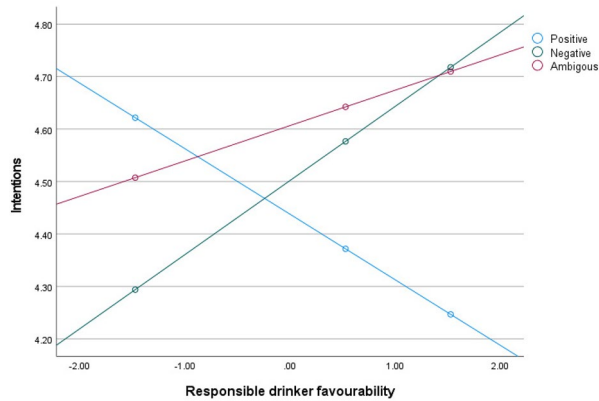


Figure 2. The interaction between condition and responsible drinker favourability.

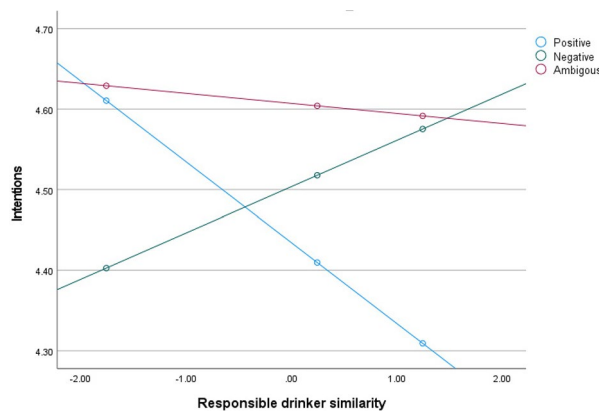


Figure 3. The interaction between condition and responsible drinker similarity.

AUDIT scores were significantly correlated with all four prototype perception measures (see [Table 5](#)). However, AUDIT scores were not a significant moderator of the impact of label condition on drinking intentions (see [supplementary table 1](#)) suggesting that the moderation effects observed are not merely an artefact of the relationship between prototype and AUDIT scores.

Discussion

This study explored how positively framed, negatively framed and ambiguous messages presented on alcohol labels impacted on drinking intentions and message perceptions. Additionally, it explored if prototype perceptions would moderate the impact of these messages.

While message type had no impact on intentions, positive and negative messages were more likely to change behaviour than ambiguous responsible drinking messages. At present, in the UK, it is not mandatory to include health warnings. Responsibility statements may be preferred by the alcohol industry because the term 'responsible drinking' lacks a clear definition (Maani Hessari & Petticrew, 2018). Our findings

Table 5: Correlations between prototype perceptions and AUDIT scores.

	Heavy drinker favourability	Heavy drinker similarity	Responsible drinker favourability	Responsible drinker similarity
Heavy drinker favourability				
Heavy drinker similarity	.432**			
Responsible drinker favourability	.042	-.075		
Responsible drinker similarity	-.177**	-.255**	.439**	
AUDIT score	.305**	.398**	-.121**	-.427**

Note: ** denotes correlation is significant at $p < .001$.

suggest that compared to more specific health warnings, ambiguous messages are unlikely to lead to changes in behaviour. In fact, during lab experiments, responsible drinking posters were associated with increased consumption compared to control posters, perhaps explained by the idea that they promoted a social norm of drinking (Moss et al., 2015). Arguably, placing responsible drinking messages on product labels enables the alcohol industry to pay lip service to the notion of corporate responsibility without an associated impact on sales.

Consumers may respond differently to messages focused on different health conditions. Our descriptive analyses indicated the cancer messages were rated the most novel but least believable in the study, in line with other research (Winstock et al., 2020). Interestingly, another UK study found that participants who were aware of the links between alcohol and cancer were more likely to support alcohol control policies (Bates et al., 2018), suggesting it is in the alcohol industry's interests that this information is not included on labels. Whilst information alone is considered a 'weak driver of change', (Marteau, 2016), it is recognised that novel information about health risks has the potential to change behaviour, and exploring new ways to raise awareness is important (MacKinnon et al., 2001).

It was also interesting to note that believability varied according to message type, with liver messages rated more believable than cancer and heart disease messages. This could be related to previous awareness (i.e. they were less novel and more familiar), however it may be that self-serving bias plays a role that people are less likely to question the validity of less threatening messages (Campbell & Sedikides, 1999). Interestingly, ambiguous messages were the most relevant messages in this study, perhaps because respondents perceived themselves as responsible drinkers following prior exposure to these kinds of messages.

Responsible drinker favourability and similarity were significant moderators. Compared to those in the positive condition, for those in the negative message condition, drinking intentions post message exposure were greater when they rated the responsible drinker prototype more favourably and similar to themselves. The effect was not observed in the ambiguous condition compared to the positive condition. Prior research has found that negative messages may be more impactful both in terms of motivations to reduce drinking and also result in higher avoidance of messages when compared to positive messages (Blackwell et al., 2018). Avoidance of messages has been shown to result in lower intentions to quit smoking (Hall et al., 2016). Thus, it is possible that identifying as a responsible drinker may result in higher levels of avoidance of the negative messages, resulting in greater drinking intentions. This effect needs to be further explored to substantiate this hypothesis, with the inclusion of a measure of avoidance.

While this moderation analysis was exploratory, it warrants further attention in order to understand the conditions in which certain messages may impact behaviour, especially given that AUDIT score had no moderating effect. It may be that interventions to encourage people to evaluate their drinking in a realistic manner are needed in order for information to have an effect. Our findings also urge caution when using negative messaging. As moderators of intervention effects are often poorly understood (Rothman & Sheeran, 2021), this study underscores the importance of exploring prototype perceptions as moderators.

Implications

Current labels presented on alcohol products that include ambiguous responsible drinking messages are the least likely to encourage people to consider drinking less compared to positive or negative framed labels. However, it is likely that the alcohol industry would oppose measures to include more information such as that relating to cancer, liver or heart disease on labels (Gleeson & O'Brien, 2021), and so it is important to raise awareness of alcohol related harms more widely than by means of product labelling. Negative messages may have the potential to encourage people to reduce their alcohol consumption, but additional interventions may be needed to encourage heavy drinkers to realise that they are not actually responsible drinkers.

Limitations

This study was not powered to test for the moderation effects, which should be treated as exploratory. A high proportion of the sample were low risk drinkers, who may accurately identify as responsible drinkers. Drinking intentions were measured immediately after message presentation with no baseline measurement, therefore future studies should include baseline and post-message intentions to more precisely quantify the effect. We measured participants' drinking intentions but not their actual drinking behaviour; future studies of this type should measure both because they can be dissociated. For example, Harris et al. (2009) found that messages about breast cancer had no immediate impact on intentions, but had a significant impact on drinking behaviour one week later. It is also likely that our text based messages were not attended to for sufficient time, and other studies have shown that messages using image and text were the most impactful (Pechey et al., 2020). Further to this, there is some debate about the utility and interpretation of positive/negative messages and how they relate to loss/gain frames (Bernstein et al., 2016).

Findings relating to prototype perceptions need to be replicated and further disentangled in a larger, independent sample, powered to detect moderation effects. While meta-analyses show that prototypes directly predict intentions and behaviour (e.g. Todd et al., 2016), the route to behaviour in the social reaction pathway in the PWM is assumed to be via willingness, and we did not measure this construct or test this relationship. Additionally, we did not provide a definition of the terms 'responsible' or 'heavy' drinker. This should be explored further with adult drinkers as much previous research on drinker prototypes focuses on young people (Davies & Todd, 2021). It is also possible that the moderation effect was observed for the responsible drinker prototype because the messages themselves mentioned responsible drinking.

We attempted to explore some possible aspects of message acceptability. Acceptability has been conceptualised in a number of ways, and can relate to people's attitudes, perceptions and how compatible a message is with an individual's identity (Sekhon et al., 2018). However, while it is important that any intervention is acceptable to its target audience, it is not necessarily related to how effective that intervention may be (Sekhon et al., 2017). Our measures of believability and possible behaviour change were based on a previous alcohol labelling study (Winstock et al., 2020), but these measures have not been otherwise validated. Further research should use validated credibility measures (e.g. Appelman & Sundar, 2016). A more comprehensive measure of behaviour change would capture whether or not people actually reduced their alcohol consumption, as in lab studies (Moss et al., 2015; Wigg & Stafford, 2016).

As this was an online experimental study, it lacked ecological validity, which is a problem with much of the existing research on alcohol labelling (Clarke et al., 2021). There was also a slight variation in the font size on one of the messages, although it is likely that messages of different styles and lengths would be presented on products in the real world, as is the case with tobacco. Experimental studies have demonstrated that consumers pay little attention to health warnings on packaging (Kersbergen & Field, 2017). In their study, Kersbergen and Field used eye tracking to measure people's attention to beverage labels. They showed that only 7% of viewing time was spent on warning labels, and after being exposed to a brief intervention, people still paid little attention to health information (Kersbergen & Field, 2017). These findings suggest that real world impact of including enhanced health information on labels may be small. A further limitation of our study relates to the lack of attention check questions in the University 1 version of the survey; in the University 2 version, participants who failed both attention checks were excluded from data analysis (8.6%), but these attention check questions were very easy, therefore we cannot be confident that participants who were retained for analysis were paying attention throughout the study.

Conclusions

Both positively and negatively framed, specific health messages were rated as significantly more novel, and significantly more likely to encourage participants to consider drinking less, than ambiguous messages presented on alcohol product labels. The moderation analyses were exploratory, nonetheless, as there is a lack of theoretically driven research in the labelling field (Hassan & Shiu, 2018), this study has tentatively shown that incorporating theoretical moderators may have value in developing our understanding of the impact of alcohol product labelling.

Data availability

The data that support the findings of this study are available on the Open Science Framework.

Disclosure statement

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