Exploring responses to differing message content of pictorial alcohol warning labels

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All research work was conducted while the second two authors were employed at institutions as indicated in their contact information. The first author previously worked at Bangor University. None of the authors have links to the alcohol industry. Ethical approval was obtained from the College Ethics committee at Bangor University before research took place and all requirements were followed. Research data are not shared. This is because ethical approval was not sought to allow all data to be shared with other researchers or made publicly available. Researchers who wish to gain additional insight into the data used for this research should contact the corresponding author for a fuller data summary.

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Exploring responses to differing message content of pictorial alcohol warning labels

Abstract

One way of tackling hazardous alcohol consumption is introducing warning labels on alcohol products. This research explores three under-researched message content areas in relation to alcohol warning labels: negative/positive framing of the message; use of signal words and qualifiers; and type of information used in the message (qualitative or quantitative), across message themes that depict social or health consequences. A qualitative and exploratory approach was undertaken utilising five focus groups of UK undergraduate students followed by 15 semi-structured interviews with UK adults. Discussions centred around responses to the alcohol warning labels that varied in message content characteristics. The students also created their own warning label designs based on what they believed would be useful for encouraging students to keep to low-risk drinking guidelines. Findings across both samples revealed a preference for negatively (loss) framed health messages that elicit fear and use evidence-based reasoning and statistics. The avoidance of signal words (e.g., 'government warning') and qualifiers (e.g., may cause) would likely make the messages more persuasive. Our findings contribute to understanding the influence of message content on consumer responses to alcohol warning labels. However, such message content characteristics are inherent in the design of many product warnings and our findings may apply to other contexts.

KEYWORDS

alcohol warning labels, label characteristics, label message content, health warnings, social warnings, warning design, focus groups, semi-structured interviews

1. INTRODUCTION

A recent National Union of Students survey found 30% of UK students drank alcohol to get drunk at least once a week with over 80% of students agreeing that drinking and getting drunk is part of university culture (National Union of Students, 2019). Binge drinking amongst university students can lead to reduced quality of life, including negative impacts on health, emotional state, relationships, and self-esteem (Dormal et al., 2018). However, hazardous drinking is not limited to the student population. The Office of National Statistics (ONS, 2017) report 18% of UK adults aged 25 to 44, and 17% aged 45 to 64, to have consumed alcohol above binge drink limits at least one day during the week, and alcohol dependence among adults has increased during Covid-19 lockdowns (Killgore et al., 2021), with higher levels of drinking associated with poor mental health (Jacob et al., 2021).

Part of the problem is a lack of knowledge of the risks associated with hazardous drinking (Scheideler & Klein, 2018; Hasking et al., 2005). Nevertheless, abundant evidence of such risks is present. In 2012, alcohol was attributed to almost 6% of total worldwide cancer deaths (Praud et al., 2016) with evidence that over 60 diseases and other types of trauma (excluding social and other population-level problems) have a causal link to alcohol use (Rehm et al., 2003). There is also increasing evidence of the effect of drinking on others. For example, a study conducted in England found 20% of respondents suffered harm (such as violence, crime, sleep problems) from others drinking in the past year (Beynon et al., 2019). Hazardous consumption of alcohol often becomes habitual and can be considered as 'wicked consumption behaviour' with such habits maintained because consumers derive pleasure and satisfaction from such activities (Koch & Orazi, 2017). In response, the World Health Organization recommended the adoption of alcohol warning labels as

they provide a 'unique opportunity for governments to disseminate health messages at the point of sale and point of consumption' (WHO, 2017).

According to Best and Papies (2017), the introduction of warning labels is expected to increase for food and drink products. However, to date, the consumer literature on warning labels has focused mainly on foods (e.g., Boncinelli et al., 2017; Sielicka-Różyńska et al., 2020) and soft drinks (e.g., Koch & Orazi, 2017). According to a meta-analysis on front-of-pack labelling, there is still much to be studied regarding the design of labels, in particular regarding "consumer reactions to design details, framing, or even the abstractness of the information presented" (Ikonen et al., 2020, p. 375). These findings concur with a recent systematic review (Hassan & Shiu, 2018) which explored the design of alcohol warning labels and identified a number of under-researched areas regarding warning label design, namely negative/positive framing of the message; use of signal words and qualifiers; and type of information (qualitative or quantitative) used in the message. Our research focuses on these three areas. Prior research predominantly focused on highlighting the risks associated with alcohol using health-relatedmessages (e.g., risk of foetal alcohol syndrome), which are often framed as a negative outcome for the consumer (see Hassan & Shiu, 2018). Whereas, in practice, messages can adopt a positive framing promoting the benefits of reduced consumption of alcohol. Examining the use of such warnings that engender a positive emotional reaction should be undertaken as this approach has been fruitful in other consumption contexts (e.g., Gifford & Bernard, 2006; Lewis et al., 2007). Signal words (e.g., government warning) and qualifiers (e.g., may cause) are often used in the design of warnings, yet literature findings are sparce regarding their impact on consumer responses. Furthermore, in other research contexts there are mixed findings on the applicability of qualifiers for different consumer segments (e.g., Katz et al., 2020). Finally, prior research focuses on qualitative statement formats (e.g.,

alcohol can cause cancer) yet other types of design such as the use of statistics or testimonials are much less studied but may have potential efficacy. For instance, Brennan et al. (2019) showed some utility of adding a testimonial within a tobacco health warning and Shoots-Reinhard et al. (2020) found evidence that numerical information in tobacco warnings may aid some smokers to quit. Farrell and Hamby (2018) also found that making specific risk factors clear to consumers is important in deterring engagement with risky consumption.

Macnaughten and Chilvers (2014) identified three ideal models of public engagement: the upstream model, the 'honest broker' model, and the 'issue advocate' model, with the use of the 'honest broker' model primarily related to health. In our study, we adopt the 'honest broker' model where "the function is to foster deliberation in weighing up the pros and cons of different courses of action, and the conditions, if any, under which different policy options are acceptable" (Macnaughten, 2021, p. 6). In particular, our research aims to explore consumer responses to alcohol warning labels to shed light on the following three research questions: RQ1: How do consumer responses to positively and negatively framed messages differ? RQ2: How do consumers respond to the use of signal words and qualifiers? RQ3: How do consumer responses to quantitative and qualitative information differ? In addressing these three research questions, our research aims to contribute to the literature on warnings by providing theoretical insights on the nature and roles of message content characteristics in shaping consumer responses to alcohol warning labels. To address our research questions, focus groups were undertaken with a sample of the UK student population followed by semi-structured interviews conducted with a sample of the UK adult population. Configured as 'reflective' subjects, both samples were used to address the three research questions. Utilizing two different samples improves the potential that our research findings would apply to different consumer groups which is important from a policy perspective,

as personal relevancy and demographic factors play an important role in how warning labels are perceived (Winstock et al., 2020). Further, Argo and Main (2004) in their meta-analysis on the effectiveness of warning labels found that most studies on warning labels make use of student samples and called for research to utilise other samples. Hassan and Shiu (2018) echoed the need for research that utilizes different target audiences. Thus, our research aim is also to explore potential similarities/differences in consumer responses to alcohol warning labels across the general public and the university student population. Figure 1 provides an overview of the focus of our overall research.

Insert Figure 1 about here

The paper now outlines past research on responses to (alcohol) warning labels while focusing on specific research that relates to the three under-researched areas mentioned above. After which we outline the methodology for our two qualitative research phases before providing an integrated findings section. We end with a general discussion that includes our contributions to the literature on alcohol warnings, the implications for policy makers arising from our research, some indications for future research, and finally the limitations that characterise our research.

2. THEORETICAL BACKGROUND

2.1 Use of alcohol warning labels and their effectiveness

According to the WHO (2018) 47 countries mandate some form of warning label on alcoholic beverage containers, with the most common warnings focusing on underage consumption of alcohol (41 countries) and drink-driving (31 countries). In understanding the effectiveness of warning labels, an information processing approach is commonly adopted. In their meta-analysis of the effectiveness of warning labels, Argo and Main (2004) adopted a five-step information

processing model comprising attention, comprehension, recall, judgment, and behaviour. This conceptual framework was also used by Purmehdi et al. (2017) who provided an update and extension on Argo and Main's (2004) meta-analysis. The attention dimension focuses on the ability of the warning to be noticeable and recognisable. The comprehension dimension concerns the ability of the consumer to understand the message. Recall focuses on whether the contents of the warning can be held in memory to be retrieved when needed. Consumers can have diverse reactions to warning labels such as judgements on the believability of the message, the severity of the risk, the likelihood of injury, or overall attitudes towards the product. Therefore, the judgment dimension encompasses a wide range of cognitive factors that represent reactions to the message contents and the applicability of the message to the consumer. The final behaviour dimension focuses on compliance with the warning and under what circumstances consumers will behave in ways that are (in)consistent with the message. These five steps are generally considered to follow a linear path in that each step is dependent on the preceding step.

Label characteristics encompass factors including the use of graphics, location and shape alongside textual salience and message content. We focus on characteristics of the message content, which concern the tone or framing of the message, the characteristics used in the message such as signal words and qualifiers, and the use of quantitative versus qualitative statements. Our research explores responses to the warnings and draws on the five dimensions outlined above to uncover a wide range of responses to warnings that vary in their content characteristics.

Hassan and Shiu (2018) documented the literature on the efficacy of warnings from 2000 in their systematic review and found mixed evidence. Coomber et al. (2015) concluded that "current warning labels fail to effectively transmit health messages to the general public" (p. 816). Despite these conclusions, more recent research evidenced the potential benefits of alcohol warnings.

Schoueri-Mychasiw et al. (2020) found moderate support for the impact of alcohol warning labels on awareness and knowledge of national drinking guidelines. Further, research examining consumption levels before and after an alcohol warning label intervention showed a decrease in retail alcohol sales (Zhao et al., 2020). Finally, consumers exposed (vs. those not exposed) to warning labels had higher knowledge that alcohol causes cancer, with lower alcohol consumption as a consequence of attending to and elaborating on the warning message (Hobin et al., 2020).

In research focusing on younger populations, a study of 11–19 year olds found that awareness of alcohol-related health messages was low (Critchlow et al., 2019). The results of two mixed methods studies (survey and eye tracking) showed that increased attention was paid to larger warnings, and warnings that made use of the colour red (Pham et al., 2018). Further, research findings offered strong support for larger, more detailed labels that include low-risk drinking guidelines and pregnancy warnings (Vallance et al., 2018). However, one study indicated that Generation Y consumers would prefer a small, neutral message (Annunziata et al., 2019).

A further issue to address is the potential exposure to warning labels can lead to boomerang effects or defensive reactions. Such reactions would result in negative or counterproductive responses. For example, in an experimental study with students examining the effectiveness of the USA warning, Snyder and Blood (1992) found that, compared to drinkers not exposed to the warning, drinking intentions were stronger for drinkers exposed to the warning. Other findings show that participants who had a more favourable attitude towards drinking were less likely to believe warning label messages (Andrews et al., 1990). Further, those who consume alcohol more frequently also found the alcohol warning messages to be less believable (Andrews et al., 1991). Other defensive reactions may occur, such as defensive avoidance, where individuals suppress thinking about the message or do not put effort into reading it (e.g., Brown & Locker, 2009).

Furthermore, research shows Generation Y consumers tend to avoid warning messages altogether (Annunziata et al., 2019).

Recent research presents a more complex picture on how alcohol warning labels can have utility but at the same time can cause defensive reactions. Clarke et al. (2021) in their experimental study with over 6000 adults, showed that health warning labels made a difference to drink choice, with images having the highest utility, however the labels also increased defensive reactions and avoidance. When exploring the severity of warning messages, very severe messages were found to increase defensive responses, but at the same time were perceived as more likely to increase motivation to reduce alcohol consumption (Sillero-Rejon et al., 2018). Further, in exploring warnings that contained text and images, an eye tracking study on university students found more attention was paid to the image than the text component, with a disbenefit in that increased time viewing images was associated with positive expectancies of alcohol (Monk et al., 2017). In comparing warnings comprising text only, and text with image, Hall et al. (2020) found that although graphic warnings were perceived by adults as having greater efficacy, they also resulted in greater reactance than text only warnings.

More generally, the use of pictorial warnings have been found to increase effectiveness. For instance, amongst 10–17 year olds, pictorial warnings including text messages resulted in stronger negative emotional reactions than text only warnings (Morgenstern et al., 2021). In a focus group study of 18–35 year olds, Jones et al. (2021) found warnings combining text and image to be most engaging. Similar findings were reported by Jones and Gregory (2010) with students believing pictorial alcohol warnings to be more effective than text-only warnings. Given the greater potential of pictorial warnings in capturing consumer attention, the current study utilised images in the design of all warning labels. However, these findings were not universally supported. In particular,

Stafford and Salmon (2017) conducted a study with female university students and compared three conditions: a neutral (no warning) label; text only warning; or image and text warning. These authors found no difference on speed of consumption across the two warning label conditions, but the use of a warning label slowed down consumption in comparison to the no warning label condition.

In sum, across a range of recent studies a complex pattern of responses to alcohol warning labels becomes evident. Despite the growing number of studies exploring the efficacy, as well as the design and format of alcohol warning labels, few have focused on two areas highlighted as research gaps by Hassan and Shiu (2018) and investigated by the current research, Further, the third area on message (negative versus positive) framing has resulted in mixed conclusions. These three areas are discussed below.

2.2 Negative/positive framing of alcohol warning labels

Negative (loss framing) messages highlight the risks and negative consequences of alcohol consumption, whereas positive (gain framing) messages propose actions (e.g., "Reduce your drinking") to be undertaken that offer potential benefits (e.g. reduced risks). Such loss/gain framing have been widely studied in the health communications literature (e.g., Rothman & Salovey, 1997), stemming from research on prospect theory (see Kahneman & Tversky, 1979). Early research found that for those who report higher consumption of alcohol, negative health messages ("Every drink of alcohol harms your brain") had the highest utility (Jarvis & Pettigrew, 2013). Further, a positive message about drink driving ("Make sure you're okay to drive") generated a boomerang effect (Jarvis & Pettigrew, 2013). However, subsequent research evaluating general and specific cancer-related alcohol warning messages found two positively worded messages, both phrased as a recommendation to reduce drinking alcohol, were rated as

more believable than negatively worded messages that relied on fear arousal (Pettigrew et al., 2014). Yet, other research found negatively framed warnings were more effective in encouraging consumers to drink less (Blackwell et al., 2018). Research has also found that neutral framing was preferred to negatively framed alcohol warnings amongst Generation Y consumers (Annunziata et al., 2019). Lastly, a recent large-scale cross-country study showed that a positively framed cancer message was most optimal across seven warnings that varied in framing, context (health or social focus), and level of specificity (Winstock et al., 2020).

2.3 Signal words and qualifiers in warnings

Another area that requires research concerns the use of signal words and qualifiers as these are inherent in the design of many warnings. Focus group research found participants were more likely to accept the message if "Health Warning" rather than "Warning" or "Government Health Warning" was used (Thomson et al., 2012). However, prior experimental research comparing the use of different signal sources on perception of credibility and likelihood of compliance found that signals with a specific source (e.g., from medical/health bodies or government agencies) were more credible and more likely to be complied with than the less specific signals (e.g., "Warning") (Wogalter et al., 1999). Thus, there is some debate around the effective use of signal words in warnings. Regarding qualifiers, research comparing alcohol warnings with the wording 'increases risk' versus 'can cause' found that the 'increases risk' wording was more convincing and believable for females (Pettigrew et al., 2014). However, research on the student population found that the use of qualifiers such as 'may cause cancer' was associated with less avoidance of the message (MacKinnon et al., 1994). Globally, there is a call for the use of signal words (WHO, 2017), but there remains a need to understand more clearly their benefits and limitations.

2.4 Quantitative versus qualitative health information used in warnings

Limited prior research has examined the use of quantitative information in alcohol warnings. A study found increased message recall with the use of quantitative (e.g., "More than two drinks a day can increase your risk of high blood pressure and some cancers by 50% or more"), as opposed to qualitative information in the warning label (Slater et al., 1998). However, other research found quantitative information to be less likely to be believed. A study evaluated two negative quantitative messages ("Alcohol causes around 5000 new cases of cancer each year" and "Alcohol causes 1 in 20 cancer deaths") against ten other messages (e.g., "Alcohol increases your risk of cancer") and found that the quantitative messages performed poorly in terms of believability and were perceived differently across gender (Pettigrew et al., 2014). Interestingly, Winstock et al. (2020) found specific messages (e.g., "A bottle of wine or 6 bottles of beer contain as many calories as a burger and fries") to be considered more personally relevant. A recent report (WHO, 2020) found only one study, by Hassan and Shiu (2018), to have compared qualitative versus quantitative messages, with the limited evidence suggesting that quantitative messages have less utility than qualitative messages, thus further research is needed.

3. MATERIALS AND METHODS

We used focus groups with students and interviews with the wider public as exploratory methods to tackle the research questions. Given our research focused on understanding, exploration, and discovery, qualitative methods are often deemed the most suitable method of enquiry (Brannen, 2005). Qualitative methods allowed us to uncover the rich meanings that underly responses to the warning labels shown. Furthermore, qualitative methods provided us with the opportunity to engage participants in designing their own warnings and to cover a wider range of warning themes and content features. Focus groups were conducted in person before the COVID-19 outbreak while interviews were conducted online during the pandemic. Our second interview-based study builds

on from the initial focus group study because it allowed us to test additional warning themes perceived as potentially useful in the focus group study. We focused on a small set of warnings for the interviews to gauge more deeply the responses to these warnings, whereas focus group participants were exposed to a larger number of warnings. Individual interviews also ensured that we overcame potential limitations of focus groups, which can include participants' temptation to agree with the group consensus, and the risk that one or two individuals dominate the discussion, meaning individual views and subtleties in attitudes are not represented (Stokes & Bergin, 2006). Ethical approval for the research was granted by the University's College Ethics Committee with informed consent obtained from all participants prior to the commencement of the focus groups and the interviews. The research process for each study is detailed next.

3.1 Focus groups

Focus groups are known to be particularly useful for investigating social phenomena because they make use of social interactions to uncover issues and themes that might not otherwise be exposed (Jones et al., 2012). In this study, students were recruited through emails and flyers around a UK campus university and were paid £10 for in-person participation at the university in a focus group about alcohol warning labels. There was only one inclusion criterion which was that students needed to be UK home undergraduate students. Five focus groups took place, each scheduled to last around one hour. Two moderators (one male and one female) were used in each focus group comprising between four and six participants, giving a total of 26 participants (54% female). Each focus group was recorded with the participants' permission and subsequently transcribed verbatim. All data were fully anonymised to ensure confidentiality and each participant was assigned a code. No information on prior drinking habits was solicited from participants although many did provide an account of their own drinking habits while discussing the warnings. The moderators did not ask

specifically about drinking habits or drinking behaviour to avoid causing discomfort for participants during the discussion.

Although the participants were encouraged to interact freely and the discussion allowed to range widely, the moderators used a discussion guide to ensure that all identified areas of research interest were thoroughly explored. Students across groups were encouraged to freely agree or disagree with opinions put forward by fellow group members. Across all groups, individuals often expressed mixed opinions thus implying genuine responses to the warnings shown.

The focus groups consisted of four stages. Stage one set the scene by exploring the wider social context of the use of warnings. Specifically, participants were probed to think about warnings in general and reported ones that they had seen in the previous few days. Participants at this point were encouraged to give impressions on the effectiveness of the current warnings. Stage two drew the focus to the behavioural context with the discussions centred on students' decisions regarding when to stop drinking alcohol on a night out and what prompted them to stop. The objective here was to gain an understanding of what might help in the design of warning messages that might be effective for this target population. The third stage provided specific framing of our research by the introduction of "some aspects of a perceived reality [to] make them more salient" to promote moral or other evaluations, and/or recommendation for the warnings shown (Entman, 1993, p. 53). Specifically, participants were asked to view 12/14 warnings (two were added arising from early focus groups) and provided their responses by discussing the merits and limitations of the warnings. The final stage aimed to generate concrete outcomes that might facilitate on-going or future research. Specifically, participants worked in pairs to design a warning that they believed would encourage students to keep to government low-risk drinking guidelines.

The initial set of 12 warnings (see Table 1 for warning topics) used in the focus groups were based on previous studies, and on warning label messages used in practice (e.g., from websites promoting low-risk drinking). Messages varied in style, some provided recommendations on consumption guidelines, some used signal words such as 'government warning', some included positive messages and were not intended to be fearful, while others utilised a fear-appeal approach. Generally, messages focused on either social or health consequences. Additionally, warnings employed statements that varied in formats, including the use of statistics, with general or specific messages on risks associated with excessive alcohol consumption. Lastly, some warnings were framed as a question, as Krischler and Glock (2015) reported that this format can have higher efficacy. The additional two warnings, generated in the earlier focus groups, were warnings 13 and 14.

Insert Table 1 about here.

3.2 Semi-structured interviews

To gather further insights on alcohol warning labels, 15 semi-structured interviews were undertaken with UK adults. Semi-structured interviews use predetermined questions to explore an issue whilst retaining a conversational and informal tone allowing participants to freely express their views (Silverman, 2011). A purposive sample was recruited to provide variation in age, gender, and drinking habits. An overview of the interview participants is provided in Table 2. Prolific was used to recruit participants and they were paid £10 each to take part. Participants were selected based on the following criteria: willingness to take part in a video interview, UK resident, 18 years of age or over, non-student status, and drinking at least five (10 for last seven interviews) units of alcohol per week. All interviews took place in early 2021 and were conducted via Zoom. Assurances of confidentiality and anonymity in the reporting of findings were given and

permission for the interview to be recorded was obtained from each participant in advance. An interview guide was developed with predetermined questions covering: general alcohol consumption habits, opinions on alcohol, responses towards the warning labels, design factors associated with the labels, and behavioural intentions following exposure to the warning labels. Participants were shown six warning labels (3 health / 3 social) using the 'share screen' function and probed about their thoughts with regards to the messages. Six warnings were used because testing by the author team showed that more than six images presented concurrently online led to visual clutter and reduced comprehension. Given that only six warnings were shown, the design of the warnings needed to be adapted from those used in the focus groups to achieve balance in the framing, use of signal words and qualifiers, as well as in the message format. Therefore, only one warning was identical to that used in the focus groups (See Table 1, warning 10) while two others used the same imagery (See Table 1, warnings 2 and 14) but the statement for warning 2 was changed to "alcohol can cause damage to the liver" with no recommended limits being incorporated into the warning. For warning 14, the signal word "UK Chief Medical officers say" was added to the warning and the recommendation was reworded to remove the qualifier. See Table 3 for information on the warnings used in the interviews. Given the dominance of health focused messages and our knowledge (because the focus groups were undertaken and analysed before the interviews) that some of the more socially focused messages were deemed to have performed poorly, two additional warnings were developed to be assessed in the interviews. The text and images used for two of the three warnings had been assessed in an additional pilot test undertaken amongst students and were deemed to be highly believable. The third additional warning was developed to test one of the drawings (See Figure 2 drawing 3) that students had created. At the end of each interview, the participant was asked to rank the warning labels

according to their perceived effectiveness. The interviews lasted an average of 45 minutes and were transcribed verbatim.

Insert Table 2 about here.

Insert Table 3 about here.

Insert Figure 2 about here.

3.3 Data analysis

Transcriptions of the recorded focus groups and interviews were checked for accuracy prior to data analysis. The discussion and interview guides were firstly used to develop provisional themes, with the six-step thematic analysis procedure adopted to explore the transcripts in detail and to identify main themes (Braun & Clarke, 2006). Two of the authors independently coded the transcripts. During the coding procedure, detailed code descriptors were developed and associated verbatim quotations noted. Comparison and discussions of the provisional coding schemes then took place between the two coders in coming to an agreement on the emerging themes, codes and categories, and refined until no new themes emerged.

4. RESULTS

4.1 Participants' drinking behaviours

Across the focus groups there was a mix of participants in terms of drinking amounts and drinking goals. Some students had friendship groups that were more aligned to keep drinking within reasonable limits, although these could be above government guidelines. Many students however were aiming to achieve a certain state of drunkenness that surpassed low-risk drinking guidelines.

"So, I usually just get tipsy, I don't really get drunk … because to me being drunk is when you're going to be sick" (Female, FG2).

"I know it's bad but I only drink to get drunk" (Female, FG5).

Tipsy could be considered a form of drunkenness (Szmigin et al., 2011). Overall, students tended to use signals to stop drinking that arise as a result of being drunk (e.g., physical or behavioural signs).

"The signs are usually when you can't see" (Female, FG1).

"I can kind of tell when I'm getting a bit beery, hitting on girls I really shouldn't be and kind of singing and throwing things and stuff like that. And that will be when I start to stop" (Male, FG4).

The interview participants varied in terms of alcohol consumption habits, with some drinking small amounts, and keeping to their own set limits; *"I have one cocktail most days after dinner, that's it"* (Female, Interview 4), while others drinking in excess of governmental guidelines, either frequently or occasionally; "*Normally on a Friday, Saturday and Sunday I have two to three large glasses of wine"* (Female, Interview 13). Few interview participants considered their consumption as binge drinking or admitted to drinking with the aim of getting drunk. Reasons for drinking amongst the interviewees included enjoying the taste, socialising, relaxing and easing stress. Such positive expectancies from alcohol consumption are common (Reich & Goldman, 2005).

4.2 Positive/negative framing and message themes

Across the focus groups, participants expressed a preference for health focused messages, with consistency in judgements that themes such as 'a loss of dignity' or 'social isolation' would not be suitable amongst the student population:

> *"I don't think the loss of dignity or the social isolation would be powerful enough for students"* (Female, FG1).

> *"I don't think number 1 is very good because when you're drinking you're normally with people, so you're not socially isolated because you're in a big group"* (Male, FG5).

> *"I think that a lot of people would see that as a badge of honour, that if they ended up looking like that after a night out (drunk on a bench) that they had a good time and that's not what it's really about"* (Male, FG5).

> *"The health warnings is a big thing for me. It would make me not have as many drinks as I have been. A good idea. It would probably make me tone down what I'm drinking"* (Female, Interview 1).

> *"(Warning) Number 4 might alter my behaviour and slow me down but the others wouldn't impact me"* (Male, Interview 9).

A social theme created by the students during the focus groups as likely to be persuasive for their age group was the effects of alcohol on an individual's appearance (e.g., wrinkled skin) over time (see drawings 1 and 3 in Figure 2). A number of interview participants also liked this appearance warning label, although male interviewees commented that it should be targeted at a younger, female demographic:

"I love this. It's a positive message. Our society is obsessed with before and after photos and people love comparisons. And we're quite vain." (Female, Interview 8).

"Fascinating. There is a massive difference and I didn't realise that happened when drinking alcohol." (Female, Interview 5).

"Probably would have an effect on young girls" (Male, Interview 14).

The most positively framed message concentrated on having two days free from drinking per week with a positive image. Another message encouraged individuals to alternate between alcoholic and non-alcoholic drinks on a night out, stating that it was 'Ok to refuse a drink', was shown in focus groups and during the interviews. Students were against the use of the more positive images because they might be misinterpreted. However, they thought that being able to refuse drinks was a good idea or having days set aside as alcohol-free was a realistic option that could be easily achieved:

"I don't think number 8 (2 booze-free days a week) is very powerful at all" (Female, FG4).

"Two booze-free days a week's not a lot and actually you can do that without even thinking about it" (Female, FG3).

"I think 14 like 'its ok to say no to a drink' is a good message to get across" (Male, FG3).

A number of the interview participants were in favour of the 'Ok to refuse a drink' warning and found it practically helpful in reducing perceived social pressure to drink excessively:

"It's almost like a tip rather than lecturing people." (Female, Interview 12).

"I like the message. You don't think that peer pressure goes beyond secondary school or university but it does." (Female, Interview 5).

"It's nice to have a positive message and that it's acceptable to say no" (Female, Interview 4).

However, two of the social warnings shown to the interviewees (drink drive and committing a felony) engendered defensive and counter-argument reactions:

"Doesn't speak to my age, education demographic. That's not me. That's not my world. If that was on a bottle then I'd laugh." (Female, Interview 8).

"Just because you've had too much to drink doesn't necessarily mean you go into a police van. Not effective." (Female, Interview 12).

"If anyone was going to drink and drive I don't think this would stop them" (Male, Interview 2).

Overall, the focus group and the interview participants indicated a preference for messages which employed graphic health images or scare tactics, and ones which prompted individuals to take responsibility for their own actions:

"I think definitely the health ones are definitely more striking" (Female, FG1).

"You know if you play the game you've got to know what you are getting yourself in to. It doesn't mean that it will happen to you, but you've got to know worse-case scenario." (Male, FG2).

"If it was going to turn anyone, change anyone's opinion then I think that kind of health scare kind of would" (Male, FG4).

"If you want cirrhosis have a look at the picture there. Do you know what I mean, scare them a bit. Make them think, give them this feeling of self-responsibility" (Male, FG4).

"Shocking. It's good to show the facts and not shy away from it. Hits the reality home". (Female, Interview 6).

"*Gets the point across. It's brutal. Hits home on a personal level. The simpler the better. Disgusting but has impact. Graphic is good for getting attention"* (Male, Interview 15).

"Warnings 2,3,4 and 6 are showing you how you can be negatively affected, and are more effective" (Male, Interview 3).

Students suggested additional topics which they felt would be suitable for the student population. These related to drink driving and social embarrassment (vomiting):

"It sounds a bit gross, but choking on vomit, it's like something that always gets me because you know when you come home from a night out you might not be extremely drunk, but everyone doesn't want to be sick" (Female, FG5).

"Drink driving stories are quite effective because those can appeal to absolutely anyone, students or old people or anything" (Male, FG1).

Overall, the focus group and the interview participants felt that more negatively framed, severe messages are ones which would more likely be processed. However, they also believed that care should be taken not to take an overly sanctimonious tone:

"Some people may say that the warnings are preachy. And trying to spoil their fun". (Male, Interview 6).

The support for graphic messages was further illustrated in the interview ranking results, in which they ranked the liver disease and mouth cancer pictorial warnings as most effective (See Table 3). In response to the mouth cancer warning, comments included:

*"I didn't know about that. Scares the s***t out of you"* (Female, Interview 11).

"Shocking. Two large glasses of wine for me is a quiet night out" (Female, Interview 12).

One participant (Female, Interview 8) went further, commenting that "the shock factor could be stronger." The drawings of warnings created by students also incorporated designs and themes similar to fear appeals (see Figure 2 'Scary picture' and 'scare statistics' included in drawing 1 and the extreme language in drawing 2). For students, topics such as drink driving, potential of being sick, or refusing a drink were all message themes deemed more likely to occur and therefore have a greater chance of being personally relevant. Therefore, although prior studies have focused on cancer warnings (Clarke et al., 2021; Pettigrew et al., 2014), there is a need to consider if warnings that are perceived as higher in likelihood, but potentially lower in severity, might also be suitable as some students voiced that cancer warnings can be discounted:

"I think with using cancer I think almost the problem nowadays it is so over-used almost. It's like anything you do you get cancer" (Female, FG3).

Taken together, our student and interview samples generally agreed that negatively framed health warnings are more likely to be perceived favourably than positively framed or warnings using social themes.

4.3 Signal words, qualifiers, and question formats

Our results suggested that signal words are less relevant. During the interviews, when prompted about signal words or qualifiers, most of the participants commented that it was not something that they had noticed when exposed to the warning labels. Although signal words might lead to an element of consistency across warning labels, the students noted that they would also lead to lengthier labels that are less likely to be read. In particular, the use of government as a source was perceived negatively amongst students, echoing the findings of prior research (Thomson et al., 2012):

> *"'Ooh it's a government, we don't really have to pay attention and they just ignore it"* (Female, FG1).

> *"If I see like government warning, I don't really look at it"* (Male, FG2).

Some suggestions were noted that health charities or the NHS might be more convincing sources, supporting prior research (Wogalter et al., 1999), but no strong opinion was forthcoming:

> *"Maybe giving a specific health charity or using the NHS might be better than say a government warning"* (Male, FG2).

None of the interview participants had positive responses to the signal words 'Chief Medical Officer':

> *"The use of the word Chief Medical Officers is not relatable"* (Female, Interview 12).

> *"The word Chief Medical officer is redundant and abstract. Who cares whether they say it or not. Using 'your friends will tell you' would have a stronger effect."* (Female, Interview 10).

Our results suggested that warnings containing stronger wording without qualifiers is more likely to resonate with students, thus echoing past research findings (Pettigrew et al., 2014). Although the warnings in Table 1 had made little use of qualifiers (e.g., warnings 3, 10, and 14), we asked students specifically during the focus groups for their reactions on whether warnings should use words such as 'may cause'. As can be seen in drawing 1, the students wanted a design that used "definite" information rather than emphasising what might happen. Furthermore, there was a preference for more specific personal risk information:

> *"If it has a definite consequence then you're definitely going to be more intrigued by it than 'may' because you're just like 'oh it probably won't affect me' whereas if there's definitely will affect you, you're definitely going to look at it more and take it more into consideration"* (Female, FG1).

> *"It makes it sound like an opinion straight away when you say 'may cause' but if it was like something that is real then people go... because they might disagree with it if it says 'may cause'"* (Male, FG2).

The interview participants had similar views regarding the need for unambiguous wording as follows:

> *"Alcohol does damage the liver so not 'can' but it does. If you're going to say it, say it. It's scientifically proven"* (Male, Interview 15).

> *"Warning labels 4 and 6 talk about the levels of drinking you should be thinking about. Can or will, well technically yes - I am poisoning myself."* (Female, Interview 4).

> *"Some of the wording is not definite enough"* (Female, Interview 13).

Warnings can be cast either as statements or posed as questions. Prior experimental research found young adults to respond better to warnings formulated as questions (Krischler & Glock, 2015). Warning (number 13) asked focus group participants to think about whether they have had 'enough for the night', framed in a question format with a blurred picture of a pub. This warning was not received well. Similarly, the drink driving warning label which included the question 'Have you a plan to get home tonight?' was ranked as least effective amongst the interview participants. Therefore, our results overall tended to favour fact-based statement style messages. The students felt that question formats could be misinterpreted, though some commented that this style would encourage them to think more about the message:

> *"A question mark to me indicates uncertainty so it's like 'Oh where's that figure come from'"* (Female, FG3).

> *"Well, you're questioning like the person directly… it's like they should answer in their head with like 'have you had enough already tonight' you'll think 'well no I haven't' in your drunk thoughts"* (Male, FG2).

> *"I find the number 11 'is it worth it' I feel like it's just a bit cliché to have the 'is it really worth it' it just seems a bit patronising and I think it's the kind of thing my mum would say."* (Female, FG4).

Overall, our results indicate that the use of signal words, qualifiers, and question formats are not likely to generate positive responses towards the warning messages.

4.4 Use of quantitative statistics versus qualitative statements

Our research did not confirm some prior results (Pettigrew et al., 2014) regarding the poor performance of quantitative information. In particular, students across groups were in favour of the use of statistics within the message. Further, interview participants were also amenable to the use of quantitative information, and referred to such messages as 'tangible', 'to the point' and 'relatable'.

> *"I think it's more believable with statistics"* (Female, FG1).

> *"When you've got the statistics like where there is a 92% increase that's like a near doubling in the disease over however long. And it's kind of, sort of shows you how bad it can be"* (Female, FG1).

> *"The statement I think is more relevant because it says 40% of accident and emergency people are related to alcohol and that rather is directly to you. That's just like a fact so you should go 'ok actually' that's a big percentage"* (Male, FG2).

> *"I love statistics. I love a pie chart. It's hard not to understand. It's cold, hard facts. You can't ignore the numbers"* (Female, Interview 5).
> *"It's stats based and rational. I like that it's informational based. It's dramatic and has impact"* (Male, Interview 7).

The comments below further suggest a preference for bold facts in alcohol warning labels although the students also pointed out that certain diseases (e.g., liver disease) were not perceived as posing an immediate risk, which may contribute to avoidance of the message. The students' preferences for more quantitative information in warning labels were also illustrated in a number of the drawings (see Figure 2).

"Personally, I like the A & E one more because it gives a clear figure, which is like 40% and also it's a lot more relatable to students I'd say than something you'll get later in your life if you drink too much. Like seeing a damaged liver when you're out on the town. Like I personally I might go 'yeah... that'd be bad if I got it when I was like 60 or 50'" (Male, FG2).

"It just gives you a bit of perspective about where your habits end you, wind you up compared to like people who don't do it. So, you might think 'oh no I don't want to be 3 times more likely than anyone else to end up with something horrible just because, you know, for my mistakes'" (Male, FG4).

Some of the interview participants suggested a targeted strategy when using statistical information:

"I am in favour of statistics but they need to be relatable, possibly to age. Most of these people are under 40" (Female, Interview 10).

"Quantitative information should target professionals that don't think they drink that much" (Female, Interview 13).

Overall, across both samples, our results indicate that respondents are in favour of the use of quantitative (vs. qualitative) information.

5. DISCUSSION

A recent systematic review and meta-analysis on alcohol warnings and product labelling put forward numerous topics, including those that we focus on, which have yet to be addressed in the literature (Hassan & Shiu, 2018; Ikonen et al., 2020). We add to the warning labels literature by exploring responses to three message content characteristics, including: the framing of the message

as positive (gain) or negative (loss); the appropriateness of using signal words and qualifiers; and the specificity of the message statement through the use of statistics. Such message content characteristics are not only relevant to alcohol warnings but are inherent in the design of many product warnings and therefore our findings are of relevance to researchers across the product warnings field. Table 4 and Figure 3 provide a summary of our findings relating to the three message content characteristics examined.

Insert Table 4 about here.

Insert Figure 3 about here.

5.1 Theoretical contributions and implications

Our findings across both samples revealed a preference for negatively (loss) framed, health messages. These results are consistent with Lacoste-Badie et al. (2019) who found highly threatening pictorial warnings to have stronger effect on attitudes and behavioural intentions. However, prior research on message framing found that a decision on which type of framing works best needs to take into account situational as well as individual consumer characteristics (see Wansink and Pope, 2015 for a discussion). Therefore, although overall our participants preferred negatively framed messages, there might be individual differences, such as knowledge, processing style, outcome certainty, or tolerance of risk, that explain divergent responses. Research comparing responses to positive and negative warnings for food products has found that negative framing was more effective, but also that positive framing might be effective through a different persuasion pathway (Rosenblatt et al., 2019). Our findings concur in that participants did like some of the positive messages. For instance, some focus group participants suggested ideas for alcohol warnings (e.g., a message depicting the effect of alcohol on physical appearance) which were then discussed as part of the interviews. Prior research has investigated appearance-related message

themes and found that in comparison to health-focused message themes, the appearance message resulted in higher likelihood of engaging with a brief alcohol intervention, whereas the health-focused theme resulted in increased likelihood to seek out further resources (Sallis et al., 2019).

Our research found differences in responses in terms of personal relevancy, and in the type of warnings which would lead to defensiveness and avoidance. For instance, although students viewed some of the cancer warnings as irrelevant at their life stage and thus less useful, this finding was not observed in the interview sample. Defensive processing was found in responses towards even the least severe and least effective warnings during the interviews but was less evident during the focus group discussions. For example, defensive comments and counter arguments were made by interviewees when viewing the 'committing a felony' warning label and the 'drink driving' warning label. Prior research has suggested that very severe messages led to increased defensiveness (Sillero-Rejon et al., 2018) but we also found these effects for less severe messages. Research has found that when social consequences of the negative health outcome are highlighted in the warning, this can increase vulnerability perceptions resulting in behaviour in line with the message (Murdock & Rajagopal, 2017). Murdock and Rajagopal's (2017) finding was explained by consumers' perceptions of (proximal) psychological distance, because social consequences are more commonplace and relatable in everyday life. Therefore, for younger consumers including social consequences within the cancer warning message might be a suitable approach to make the warning more relevant and effective. We also included themes that have a higher chance of occurring (e.g., accident, blurred vision) as hypotheticality is another form of psychological distance that could make the warnings more proximal and increase relevancy. However, these warnings were not seen as particularly persuasive for students.

Although some research (e.g., Krischler & Glock, 2015) has found question formats to be somewhat effective, our findings suggest caution in their use as warnings with a question format were found to be least supported, with the potential for misinterpretation across both samples. Prior research on question formats has utilised quantitative research approaches and therefore our findings provide additional insight into the reasons why this format may have limited ability to communicate risks to consumers. Further, respondents were not receptive to the use of qualifiers or signal words across both samples. Participants were looking for certainty and were less likely to favour the use of qualifiers, as they perceive such warning messages to suggest that the specified outcome from hazardous drinking is debatable. Thus, our findings add to the very limited research that explores the use of qualifiers in alcohol warnings and support the findings of Pettigrew et al. (2014). However, our research extends these findings as Pettigrew et al. (2014) found evidence only for females using text-only statements. We note that cigarette warning labels research has also found differences in effectiveness across population segments, regarding the use of present tense and qualifiers in the form of modal verbs (can, may, will), such that warnings for younger people were more effective with the less definitive use of 'may' (Katz et al., 2020). Therefore, it is important to consider the use of qualifiers within the context of the tense of the warning statement as different responses to the qualifiers may depend on the modal verb used in the warning.

Considering the use of qualitative versus quantitative statements in the message, both samples exhibited a similar preference for the use of statistics in the warning label statement. But the use of statistics was not consistently perceived as more effective as the ranking of warnings by the interviewees shows (see Table 3). Therefore, the use of statistics needs to be coupled with suitable warning themes. Furthermore, the use of statistics needs to be tied to the target segment so that the

warning is relevant. Although there is less research on warnings that incorporate statistics, research on cigarette warnings has found potential for smokers who are more numerate to be more persuaded by warnings that incorporate risk estimates (Shoots-Reinhard et al., 2020). However, research has found that including base rates in the warning can result in the message backfiring when taking other factors such as level of involvement into account (Newman & Kashmiri, 2021). Therefore, although our samples had a preference for statistical information, how best to incorporate such information still needs to be addressed.

It is important to consider the role of the COVID-19 pandemic on our findings as our research was conducted both pre-pandemic (focus groups) and during the pandemic (interviews). Our findings across the two samples are highly consistent suggesting that the pandemic did not influence how participants responded to the warning labels. However, it is impossible to detect differences directly attributable to COVID-19 due to our small samples and qualitative exploratory approach. Furthermore, it might be the case that the adult sample responses were similar to the student responses because of the pandemic. For instance, the pandemic resulted in a loss of freedom by citizens, as social and other daily activities were restricted alongside restrictions on the opening of licensed premises. These changes altered drinking behaviours (see Holmes, 2020) and may have influenced participants' responses to warnings, with signal words related to the government as reminders of restrictions that severely affected daily life. On the other hand, trust in the government was high during the early stage of the pandemic but had returned to pre-pandemic levels by the time our research was undertaken (see Davies et al., 2021). Our warnings for the interviews had made use of the 'Chief Medical Officer' signal word, and during the pandemic the Chief Medical Officers in the UK nations were given high profiles alongside governmental leaders. Therefore, participants would have been more aware of these individuals

during the pandemic. Furthermore, some types of social warning messages (drink driving, refusing a drink) may have been less relevant during the pandemic as drinking was mainly at home and not with others outside the household. Nevertheless, the responses to the social warnings were consistent across samples as were the general views on the use of signal words.

5.2 Implications for consumers and practitioners

The findings of this study provide justification for alcohol warning labels as a valuable means in tackling excessive alcohol consumption and offer guidance for governmental and public health bodies in the design of alcohol warning labels. Likelihood of compliance was explored in the interviews and the general consensus was that warning labels would make consumers consider how much they drink, and likely reduce the amount of alcohol consumed in one single occasion. To maximise the likelihood of capturing the audience's attention, overcome possible consumer informational irresponsiveness, and engender positive responses in line with the message, our findings suggest that warning labels should include explicit facts containing statistical information, and use striking, graphic images to evoke fear or other negative emotions. These findings are in line with Koch and Orazi (2017) and Best and Papies (2017) who argued that strong, prominent and emotionally stimulating warnings are needed to capture the attention of consumers and overcome automatic behaviours arising from habit. Past research found that specific risk factors pertinent to specific target audiences are needed to engender compliance (Farrell & Hamby, 2018). Our research found a number of message themes to be suitable, and could work, for different target segments. Thus, one recommendation is to include different warnings in rotation, or different warnings could be placed on specific alcoholic brands according to their target demographic. Warnings containing a graphic image would help the warning to stand-out from other information on the product, but the time to process the warning is longer if signal words and qualifiers are to

be incorporated in it. The current study revealed that in designing warnings, the use of qualifiers or signal words is not needed and thus the text statement can be kept shorter. We used signal words as part of the message statement and as part of the recommendations provided, with neither placement for the signal words considered suitable by participants. We also explored different types of signal words (e.g., government, charities) but did not find a difference in participants' responses. We would therefore suggest that the WHO revisit their recommendation to incorporate signal words in warnings (e.g., WHO, 2017). UK universities could also incorporate these findings in the development of communications to students about the dangers of binge drinking. For instance, warning messages could be placed in bars on and around campus, and incorporate designs in posters or as images on apps and social media channels.

5.3 Limitations and future research directions

Our research findings open up avenues for future research. As outlined in Table 4, a number of research questions remain to be explored for each of our three areas of focus. These questions arise from our earlier discussion that linked our findings to the broader research on product warnings. Many research gaps still need to be addressed to ensure alcohol warning labels are designed in the most efficacious manner. First, research has yet to provide clear indication on the relative merits and potential drawbacks on the combined use of social and health themes within the same warning message. Second, future research could draw on and extend Dörnyei and Gyulavári's (2016) framework as there is a need to identify and understand how personal and/or situational factors might influence consumers' engagement with such warnings. Third, in terms of the use of statistical information, future research needs to pay attention to individual difference factors, such as consumer literacy. In particular, research has found low literacy to hinder consumer's motivation to engage with product labels (Tian et al., 2021). More generally, future research should

also examine how factors such as brand trust that might create a shield that would counteract the impact of the warning (Vizcaino & Velasco, 2019). Research also found a need to investigate the information architecture, such as placement of the warning on the product (Sielicka-Różyńska et al., 2020), and the use of white space (Kwan et al., 2017), that can influence how messages are processed. Lastly, there may be concerns by industry partners that warnings can negatively affect consumers' willingness to pay for their drinks. Boncinelli et al. (2017) found a warning label to have no significant effect on consumers' willingness to pay for confectionary. Future research should examine if Boncinelli at al.'s (2017) finding also applies to alcohol warning labels.

A number of limitations to our research need to be made clear. These include the use of small samples of participants, and the use of students from only one university. Our research adopted an exploratory approach which means that future research is needed to assess the replicability of the findings in other situations and contexts. Furthermore, qualitative research approaches are typically less able to detect small differences between consumer segments and therefore future research needs to consider the applicability of message content across different consumer segments (e.g., gender, drinking habits). Future research also needs to adopt methods such as experimental studies that can more precisely examine the effects, for instance, of different types of signal word or qualifier on the effectiveness of the warning messages. Our research also did not examine whether participants would recall the warning messages and therefore this information processing stage should be considered in future research. Lastly, consumption behaviour and behavioural intentions were explored in the interviews but not explicitly in the focus groups, and participants' recall and actual behaviours following exposure to the warning labels were not investigated.

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FIGURE 1 Research focus: Research gaps, contributions to literature, and policy implications

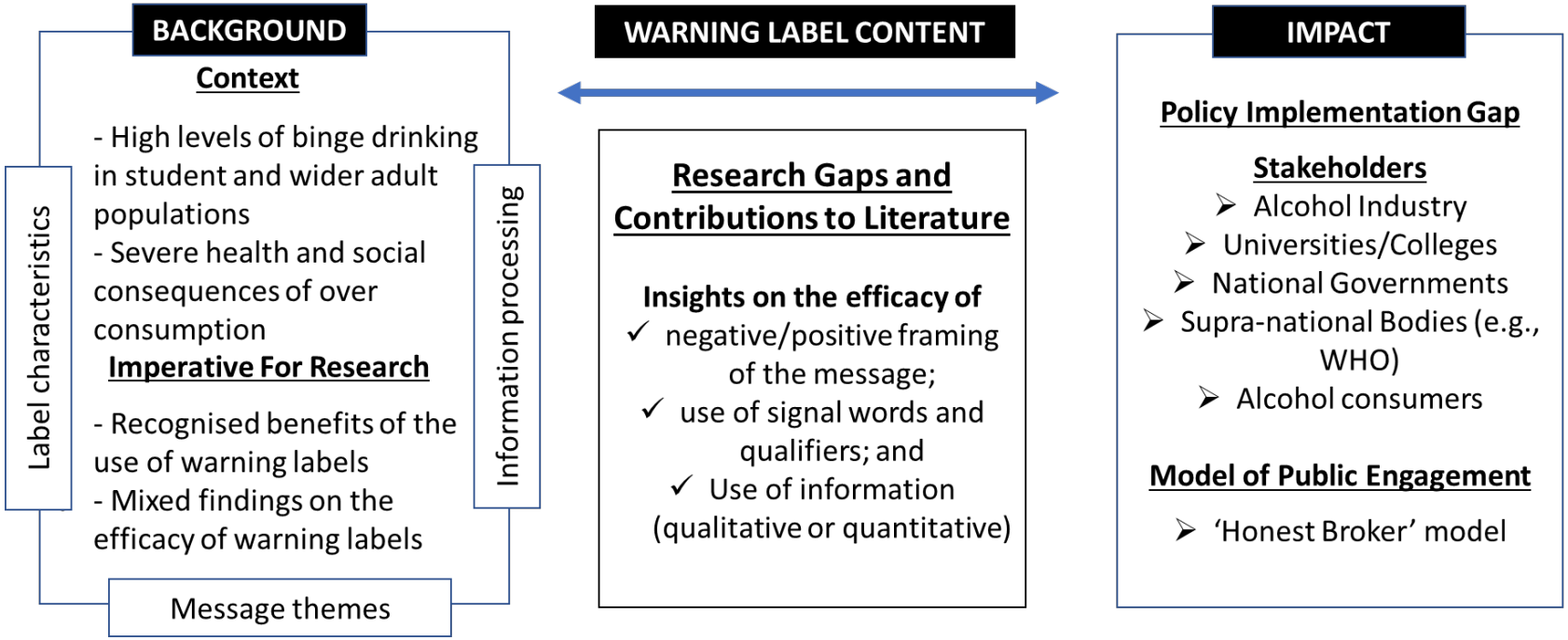


FIGURE 2 Focus group drawings

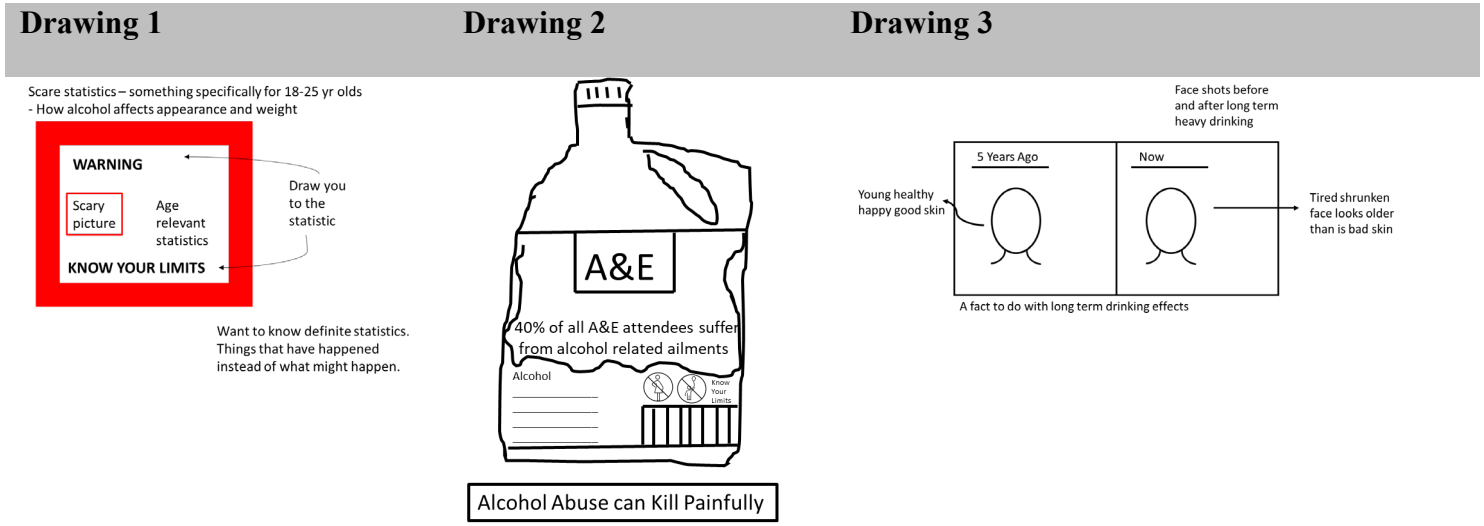
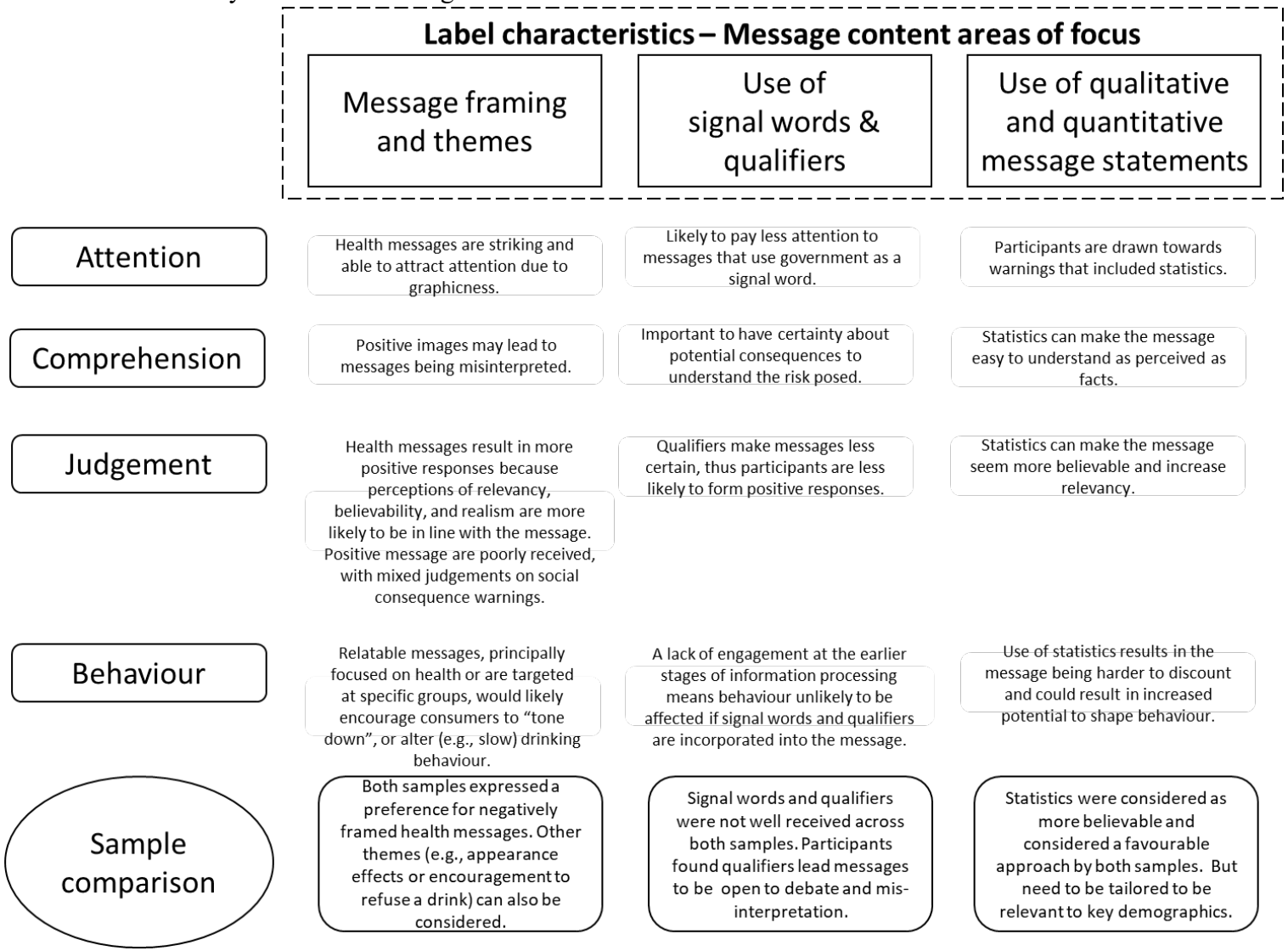


FIGURE 3 Summary of research findings



Note: The Argo and Main (2004) framework dimension of recall is omitted as participants have not previously seen the warnings used in the research.

TABLE 1 Focus group warning topics (Images are available from the authors on request)

No.	Topic (format)	Warning text
1	Social isolation (statement)	Drinking alcohol above daily guidelines increases your risk of social isolation. Know your limits 2-3 units per day for women 3-4 units per day for men.
2 *	Liver cirrhosis (statement)	Drinking alcohol above daily guidelines increases your risk of liver cirrhosis. Know your limits 2-3 units per day for women 3-4 units per day for men.
3	Loss of dignity (statement, qualifier)	Drinking alcohol above daily guidelines can lead to a loss of dignity. Know your limits 2-3 units per day for women 3-4 units per day for men.
4	Accident (fall) (statement)	Drinking alcohol above daily guidelines increases your risk of accidents. Know your limits 2-3 units per day for women 3-4 units per day for men.
5	Alcohol related accidents or injuries (national statistic, non-fear, signal word)	Government warning: Around 40% of patients admitted to Accident and Emergency departments (A&E) are diagnosed with alcohol-related injuries or illnesses.
6	National increase in alcoholic liver disease (national statistic, question format, non-fear)	Do you know that nationally there has been a 92% increase in alcoholic liver disease? Find out the facts at: *www.drinkaware.co.uk*
7	General disease association (statement, signal word)	Health warning: Over 60 diseases have been causality linked to alcohol use. Know your limits.
8	Two alcohol free days (positive)	We've stopped drinking so much, having two booze free days a week, and we're feeling the benefits (True story: Tracy and Debora Lewis)
9	Liver cirrhosis	'I got cirrhosis at 34'. Hear my story at: NHS website link provided
10*	Mouth cancer (risk statistic, signal word, qualifier)	WARNING (in a red box). By regularly drinking two large glasses of wine (ABV 13%) or two pints of strong lager (ABV 5.2%) a day could make you three times as likely to get mouth cancer.
11	Breast cancer (risk statistic, question format)	By regularly drinking just above the guidelines, of 14 units of alcohol per week, increases the risk of getting breast cancer by around 20%. Is it worth it?
12	Family experience	My dad died aged 54 due to his alcoholism, he was still holding a job down but was struggling. *Don't be like him, think about how much you are drinking.* (True story: Simon Lewis)

13	Blurred vision (question format, non-fear, signal word)	Health charities say THINK: Have you had enough already tonight?
14 *	Refusing a drink (statement, positive, qualifier)	It's ok to say, no you don't want a drink. Alternating alcoholic and non-alcoholic drinks can help you keep within government drinking guidelines.

Note: Warning texts shown were in black except when shown as red in the table. Non-fear warnings were those that did not use a graphic image and provided information that was not explicit in heightening individual risk perceptions. Those not labeled as non-fear used images or wording that could be considered as evoking fear. Positive statements used non-fear images. * Used to signify similar warnings used for the interviews.

TABLE 2 Interview participant characteristics with sample quotes

ID	Gender	Age	Occupation	Living environment	Selective quotes
1	Female	46	Accounts Administrator	House share	*"Using numbers is good if it's based on research."* *"The health warnings is a big thing for me. It would make me not have as many drinks as I have been. A good idea. It would probably make me tone down what I'm drinking."*
2	Male	37	Civil Servant	Renting with partner and child	*"I would read it but it probably wouldn't alter my behaviour."* *"If anyone was going to drink and drive I don't think this would stop them."*
3	Male	37	Logistics Manager	Renting with partner and child	*"For someone like me who is blasé, something which is more hard-hitting and full of imagery, they are more likely to resonate with me. I honestly don't think it would be much of a deterrent. It would just gloss over me, but maybe the hard hitting ones...people are rejecting the state's interference."*
4	Female	45	Homemaker	Own home with husband	*"It's nice to have a positive message and that it's acceptable to say no. People might not have thought about that. I don't want to see the horrible images."*
5	Female	24	Self employed	Living with parents and partner	*"I love statistics. I love a pie chart. It's hard not to understand. It's cold, hard facts. You can't ignore the numbers."* *"They're not aesthetically pleasing. I would read it but I'm not sure how much it would affect me drinking it. I'm going to buy it anyway but it's good to have the information. It might affect how much alcohol I would drink in one sitting but it wouldn't stop me from having the alcohol."*
6	Male	34	Ice rink supervisor	House share	*"I like numbers and I feel comfortable with it but not everyone does."* *"Some people may say that the warnings are preachy. And trying to spoil their fun."* *"It would make me think about it a little bit more. I could fall into drinking every day so one of these labels on the beer whilst I'm picking it up would make me more conscious. I'm not against it. But a younger me may be against it."*

7	Male	27	Company Director	Own home with partner	*"Using the word Chief Medical officer is odd. Has a weird paternal vibe to it."* *"It's stats based and rational. I like that it's informational based. It's dramatic and has impact."*
8	Female	30	Musician	Renting with partner	*"The positive ones I'm more likely to remember later."* *"I love this. It's a positive message. Our society is obsessed with before and after photos and people love comparisons. And we're quite vain."* *"The shock factor could be stronger. It's not as stigmatized as smoking and a lot of bad effects are covered up."*
9	Male	55	Biomedical Scientist	Own home alone	*"I'm a numbers guy so numbers mean a lot to me but only when specific."* *"It's a good thing. It was great to have the hard hitting ones on cigarettes. Number 4 (mouth cancer) might alter my behaviour and slow me down but the others wouldn't impact me."*
10	Female	62	Writer	Own home with son	*"I am in favour of statistics but they need to be relatable, possibly to age. Most of these people are under 40."* *"The word Chief Medical officer is redundant and abstract. Who cares whether they say it or not."* *"I would be more likely to look for a bottle which didn't have a warning on it, if there is a choice. I don't know if it would stop me buying it. I think I might be a bit cross as I don't have a high alcohol consumption, but then again we all think this way."*
11	Female	36	Self employed	Renting with partner and two children	*"I'd be shocked, it might not have an impact in terms of buying it. It's a good idea but I don't know how many people may take note. Some people will just turn it round. It's good for the ones who really binge drink."*
12	Female	38	Supplier manager	Own home with husband and two children	*"The ones which show you the benefits of reducing your drinking are far more effective."* *"The use of the word chief medical officers is not relatable."* *"It depends on timing. If I was in a restaurant and I saw number 5 (refusing a drink) it probably would work. I would*

					order water too. I think the health ones have a place on the products, a reminder of what the effects of alcohol can be."
13	Female	44	Teacher	Own home with husband and one child	*"Quantitative information would target professionals that don't think they drink that much."* *"(Warnings) 2 (liver cirrhosis) and 4 (mouth cancer) would make me think."*
14	Male	48	Government Services	Own home alone	*"It would make you think but would it stop me? Probably not. I don't know that it would be targeting someone like myself but you wouldn't feel good buying it."*
15	Male	40	Pilot	Own home with partner	*"Alcohol does damage the liver so not can but it does. If you're going to say it. It's scientifically proven."* *"This sort of advertising is good because some of the pictures do get the message across but like the cigarettes if they want to buy it they don't care what the label says. For people who drink moderately it may make a difference."*

Note: The first 8 participants in the table drank less based on the prolific respondent categorisation but discussions during the interviews revealed that participants 1, 8, 12, 13, and 15 were most likely to be the heaviest drinkers in the sample (who drank above weekly low-risk drinking guidelines).

TABLE 3 Warning topics used in the interviews

No	Topic (format)	Warning text	Ranking (1=best) and (score: 6=most effective)
1	Committing a felony (risk statistic, signal word in recommendation)	Three times as many adult binge drinkers reported committing an offence compared with other regular drinkers/non-drinkers. Don't increase your risk. UK Chief Medical Officers recommend that adults do not regularly exceed 2-3 units daily.	Rank 5 (1.7)
2	Liver cirrhosis (statement, qualifier)	Alcohol can cause damage to the liver.	Rank 2 (3.6)
3	Drunk driving (question format, non-fear)	Alcohol affects your ability to drive. Don't risk it. Have you a plan to get home tonight?	Rank 6 'worse' (1.4)
4	Mouth cancer (risk statistic, signal word, qualifier)	Identical to warning 10 in table 1	Rank 1 'best' (4)
5	Refusing a drink (statement, positive, signal word)	UK Chief Medical officers say It's ok to say, no you don't want a drink. Try alternating alcoholic and non-alcoholic drinks to help you keep within government drinking guidelines of 2-3 units daily.	Rank 4 (2.1)
6	Appearance (statement, positive, qualifier, signal word in recommendation)	Drinking less can help you look your best. See the difference cutting down makes. UK Chief Medical Officers recommend that adults do not regularly exceed 2-3 units daily.	Rank 3 (2.3)

TABLE 4 Message content area, literature base, recommendations, and research gaps

Policy area	Description	Literature and theories	Policy recommendations	Research gaps
Negative/positive framing of the warning message	Negative messages highlight the risks and negative consequences of alcohol consumption. Positive messages propose actions to be undertaken that offer potential benefits.	Annunziata et al. (2019) Random utility theory; Blackwell et al. (2018); Jarvis and Pettigrew (2013) Utility theory; Pettigrew et al. (2014); Rothman and Salovey (1997) Prospect theory; Winstock et al. (2020).	Focus on negatively framed messages but adapt messages to different age segments. Message should focus on encouraging consumption within guidelines, without being perceived as prescriptive. Some positive messages (e.g., refusing a drink) can be considered. But positive messages need to be tested before use.	How might social consequences or positive benefits be incorporated into negatively framed messages to increase efficacy? What might be key individual differences that explain divergent responses to the same warning messages? Incorporate underutilised theory (such as psychological distance) into understanding the efficacy of alcohol warnings.
Use of signal words and qualifiers	Signal words (e.g., 'Government health warning'). Qualifiers (e.g., 'can cause cancer').	Pettigrew et al. (2014); MacKinnon et al. (1994); Thomson et al. (2012); Wogalter et al. (1999) Persuasive communication theory.	Design messages without signal words. The use of qualifiers and question formats should be avoided.	How does the tense of the warning statement influence the processing of qualifiers? Would consumers' acceptance of qualifiers differ across messages indicating consequences that are more/less likely to occur? How might individual differences (such as tolerance for ambiguity)

				affect responses to warnings that use/do not use qualifiers?
Use of qualitative or quantitative information	Use of quantitative information (e.g., "Alcohol causes around 5000 new cases of cancer each year"), as opposed to qualitative information (e.g., "Alcohol increases your risk of cancer").	Pettigrew et al. (2014); Slater et al. (1998) Extended parallel process model; Winstock et al. (2020).	Incorporate evidenced based statistical or numerical information in the warning statement. Apply relevant information for specific target demographic (e.g., on products aimed at specific target market).	How do factors such as base rates and levels of numeracy in the target segment influence the processing of statistical information in alcohol warnings? For which message themes would statistical information be useful?