Drinkminish: Understanding Engagement of Light to Moderate Drinkers in Online Alcohol Reduction Interventions

ESZTER VIGH, University of Bristol, UK
ANGELA ATTWOOD, University of Bristol, UK
ANNE ROUDAUT, University of Bristol, UK

We investigated the engagement patterns of light to moderate drinkers, specifically targeting the deployment of alcohol reduction interventions on online grocery shopping platforms. While interventions for heavy drinkers have been extensively studied, there is a critical gap in addressing the needs of moderate to light drinkers, who represent a significant portion of the population but remain relatively unsupported in managing their alcohol consumption. This demographic often faces unique challenges in maintaining their motivation for healthier consumption habits, necessitating tailored strategies to support their goals. We conducted questionnaires (N=37), interviews (N=11) to gain insights into the needs of light to moderate drinkers concerning alcohol reduction tools. Our thematic analysis of the data was utilized to create a design guide underpinning the different factors impacting motivation and preferences. We found that health and wellness promotion, personal empowerment, the social and cultural context of alcohol consumption, and user-centered design influenced the alcohol tool. By understanding light to moderate drinkers' behavior, we hope to offer insights on how to further develop alcohol reduction interventions.

CCS Concepts: • **Human-centered computing** → **Walk-through evaluations**; **User studies**; *User interface design*; *Activity centered design*; *Participatory design*; **Interface design prototyping**.

Additional Key Words and Phrases: alcohol reduction, online grocery shopping, online engagement, public health interventions online, light drinkers, moderate drinkers

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1 INTRODUCTION

Alcohol consumption is a widespread social activity with varying patterns across different demographic groups. While heavy drinking has long been the focus of public health interventions due to its severe health risks, light to moderate drinking is often perceived as less harmful and consequently receives less attention. However, light to moderate drinkers comprise a substantial segment of the population and face unique challenges in managing their alcohol consumption. This group often lacks the targeted support necessary to maintain their motivation for healthier drinking habits, which can lead to a gradual increase in consumption over time.

Light to moderate drinker are less likely to exhibit the severe health consequences associated with heavy drinking, but they still face significant problems. There are several associated health risks, including an increased likelihood of developing certain cancers, liver disease, and cardiovascular issues [47, 135]. Socially, even moderate drinking can lead

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to dependency, creating a pattern where individuals rely on alcohol to relax, socialize, or cope with stress. Alcohol harm also does not discriminate against victims, be it property damage caused by alcohol impaired individuals [128], animal cruelty at that hands of those impaired by alcohol [140], and the impact to workforce productivity and safety as a result of presenteeism [11, 51, 76, 133, 134].

Online grocery shopping platforms are particularly a problem in this context. They have become increasingly popular, providing consumers with the convenience of purchasing alcohol without the social stigma associated with buying it in person. This ease of access can contribute to more frequent and higher volume purchases, subtly encouraging increased consumption. Furthermore, the COVID-19 pandemic has significantly altered purchasing habits, with many consumers shifting to online shopping to avoid physical stores. This shift has persisted even after the pandemic, indicating a lasting habit of increased online alcohol purchasing and this is particularly true in the United Kingdom (UK) [15, 90].

Previous research has extensively examined interventions for heavy drinkers, providing a wealth of knowledge on effective strategies for this group. However, the relatively under-explored domain of light to moderate drinkers necessitates a focused investigation to bridge this gap. Understanding the factors that influence their drinking behavior, such as health and wellness promotion, personal empowerment, and the social and cultural context of alcohol consumption, is crucial for designing effective tools. Online grocery platforms, with their direct access to consumers at the point of purchase, offer a unique opportunity to implement design interventions effectively. By integrating tailored alcohol reduction mechanisms within these interfaces, we can provide timely and relevant support to moderate drinkers, encouraging healthier consumption habits and mitigating the risks associated with alcohol use.

The challenge thus lies in designing interventions that resonate with light to moderate drinkers, who typically manage their health outside the framework of formal healthcare systems. To address this, there is a pressing need to identify the most effective intervention strategies and tailor them to the preferences and behaviors of this user group. This paper seeks to address these critical questions by investigating the goals, motivations, and challenges faced by light to moderate drinkers in managing their alcohol consumption. We particularly aim to gain insights into user preferences and develop tailored intervention strategies that resonate with this population. In particular our research questions are:

(1) What are the goals of light to moderate drinkers engaging with alcohol interventions?
(2) How can these users cultivate motivation in their daily lives to address their drinking?
(3) What are the challenges in developing online design interventions for light to moderate drinker populations?
(4) How do we enhance the usability and effectiveness of the tool for this population?

To address these questions we utilized a mixed-methods approach [39]. We used a pre-screening questionnaire to identify alcohol consumption level and general thoughts on interventions. We then interviewed participants using a range of activities probing discussion on motivation and alcohol reduction tool. Both the interview and recorded content totaled 9 hours and 56 minutes which centered around the functionality and implementation of an alcohol tool addressing five interventions. These interventions have been proposed in the literature [142] as part of an iterative design process with end-users but have not been currently evaluated: no/low alcohol product swap options, warnings, no/low alcohol product promotion, sort options by alcohol unit, and modifying the salience of alcohol unit information.

We used a thematic analysis to gain insights on the focal points of the alcohol reduction tool. Our results show the goals of light to moderate drinkers center around: health and wellness, the users of an alcohol tool foster motivation through personal empowerment, the main challenges facing this user population is the social and cultural context of alcohol consumption and purchasing, and user-centered design enhances the usability and effectiveness of the tool. Through this, our paper provides insights into the motivations driving the utilization of alcohol reduction interventions

among individuals who consume alcohol lightly to moderately. This aims to enhance comprehension of their motivations and functional requirements, thereby furnishing valuable guidance for designers tasked with developing such systems.

2 RELATED WORK

Note that in this paper we use the UK standards defining light drinkers are formally as consuming 2 units (for men) and 1 unit (for women) in a week as well as reporting not being drunk in the previous two months [63]. Moderate drinkers are defined as those drinking less than the maximum safe weekly limit of 14 units in a week [104]. We employ the term "light to moderate drinkers" to characterize these specific demographic groups (see Figure 1).

Our work builds on two areas: empowered engagement and agency. We also discuss light to moderate drinker engagement, alcohol policy online, and online engagement in health interventions. The reason why we focus on these themes is that because developing tools for a population that isn't actively harming themselves is difficult. The UK government has said what the safe weekly maximum is, that being 14 units a week spread out across 3 or more days [104], but the population who are being instructed of this public health information needs to be motivated to comply to that suggested, and not strictly enforced limit. Previous work in the area has highlighted this in part comes from an enhanced sense of control [91].

Fig. 1. Light to Moderate Drinker Classifications in the UK

2.1 Empowered Engagement

Empowering people to make positive health decisions can help sustain desired behavior change [125]. This has been found in much earlier work as well citing the differences as different "stages of change" [44]. The scaffolding provided to empower patients in the health education space has found engaging with patients on health education topics prior to sessions leads to more effective delivery [25]. There is work in the space of understanding empowerment as it relates to addiction treatment, but concentrated in the opioid and amphetamine treatment space in the United States [46]. Other work in the substance abuse area has found that moving away from "risk focused" interventions leads to greater rates of empowerment in making changes across a 30-day trial period [87]. There have been multi-step, mixed-method empowerment measurement methods established in the area of substance use recovery which could be adopted in the alcohol space to better evaluate interventions [68]. Looking at this exploration across the health education and addiction spaces can guide alcohol work in a way that pulls upon established psychology-based methodology.

We designed a study to better understand the intersection of designing digital alcohol interventions for light to moderate drinker populations and preventative engagement. The central model being applied is the extended parallel process model which has been applied to health related behavior change. This model looks at impacting self-efficacy and response-efficacy [150]. Both concepts have an impact in how users will want to engage and act upon the interventions. By running this study our goal is to investigate the best method of scaffolding alcohol purchasing behavior change on online grocery shopping platforms for a group where the motivating factors in purchasing less alcohol isn't clear as the severity and susceptibility to alcohol harm is lower than that of heavier drinkers. The way to engage non-risky drinkers will be different than those with a clearer harm or threat of harm concern.

2.2 Agency

A sense of agency refers to the feeling of control over actions and their consequences [102]. This central concept of agency is significant in how we approached this study as researchers and how we engaged the target population. In Human-Computer Interaction (HCI) a user's sense of agency is important to keep in mind as new interventions and interfaces are designed [102]. In health, agency is a vital component in a feeling of well-being and satisfaction; being able to be in control leads to people feeling more satisfied with the state of their health [102]. As it relates to the specific application area of addiction, agency and the concept of choice need to be underpinned as achievable without blame [112]. This specifically needs to be taken into consideration in this specific application area as the stigmatization of people with alcohol use disorder (AUD) remains comparatively high and is distinct from that of other substance-unrelated disorders [82]. Despite this the target group not being those with diagnosed AUD the stigma around the topic is a challenge that needs to be addressed in engaging the population.

2.3 Light to Moderate Drinker Engagement

The engagement of heavy drinkers is widely explored via both digital and physical studies [52, 116, 152]. Heavy drinkers are classified as those drinking more than 35 units per week [3]. Those classed as heavy drinkers have a different range of resources available to them in comparison to those drinking in the other groups, but the general alcohol support tab on the NHS website does not list resource access according to the different drinking categories [5]. There are however interventions that could work better for the light to moderate drinking groups as opposed to the heavy drinking group. This is evidenced by studies working on behavior nudges serving a preventative role in tobacco and alcohol addiction [105]. The success of nudging didn't change across different personality constructs either when tested in a broader

online shopping study [69]. Clinical guides have found there is value in continued brief interventions (BI) that can lead to behavior change or lay the foundation for engagement with alcohol cessation resources in a different setting [122]. With this preventative success established, it is worth further understanding this light/moderate drinking group to understand how to best deliver the interventions. The heavy drinker population involved in clinical support have a range of applications and other digital interventions available to them [151].

The motivation around engaging the light to moderate drinking population is support healthy decision making prior to dangerous levels being reached. Previous studies in alcohol addiction have cited early intervention as a valuable area of future research [18], particularly in studies centered around women with AUD [94], young people with multiple substance use and mental health concerns [53], and fetal alcohol syndrome [55, 78, 115].

2.4 Alcohol Policy Online

In the UK there is guidance for online retailers on how to sell alcohol legally online [8]. Despite the guidance, it's been found that these ID policies are not being followed exactly and leading to minors with a potential access point to alcohol via the online space [90]. A point of particular interest with alcohol products is how alcoholic unit information is made available to consumers. This is an area where the guidance for online does not necessarily meet the rigor of the requirements of labeling in the physical space. In the physical space there are requirements to label alcohol as per the food labeling guidance [4, 9]. As per alcohol labeling requirements, alcohol products have the alcohol by volume (ABV) present on the label [7]. Online, the location of this information is present on the web page, but it can often be hidden in areas shoppers don't often engage with. The information required is not exhaustive and often lacks information about safe drinking limits and alcohol units in the container [10].

The other consideration is looking at specific shopping interventions around food [28]. This however opens the debate around alcohol being considered a food or a more controlled substance. Alcohol can be arguably given a similar treatment to that of tobacco products online considering the age restriction element around purchasing [72].

2.5 Online Engagement in Health Interventions and Behavior Change

There is this idea of balancing the delivery of important health information while mitigating semantic satiation with health warnings [70]. This is coupled with challenges in establishing what "good" engagement looks like in health interventions [19]. Engagement is a major contributor to the efficacy metric used to determine how successful an intervention was [19]. The amount of time does not necessarily capture what the quality of engagement was. Often times metrics of success don't encompass engagement with an intervention as an outcome [121]. A reoccurring call to action of papers on digital health interventions is that further examination of engagement as an outcome measure is important and needs to be looked into further [12]. Engagement requires an implementation strategy that understands and scaffolds the uptake of users and becomes a part of routine behavior. The selection of appropriate theory to guide the implementation process and selection of strategies is vital to the engagement of the target user group [119].

In general behavior change techniques (BCTs) are highly utilized in the space of online health interventions [139]. This paper does not focus as much on the techniques which were used to develop the interventions [142], rather the functionalities of the alcohol tool and understanding how people engage with the tool.

3 METHODOLOGY

3.1 Stage 1: Questionnaire

A four-part questionnaire was sent to interested participants and administered via Microsoft Forms to capture demographic and shopping habit behavior. The first part was based on AUDIT [138], which is a comprehensive 10-question alcohol harm screening tool. The AUDIT section of the questionnaire had one question modified to capture the types of uncertainty around alcohol terminology on the consumer side. It was developed by the World Health Organization (WHO) and modified for use in the UK and has been used in a variety of health and social care settings. We used the AUDIT to identify a participant's drinking habits (e.g. non-drinker, low, moderate, heavy). This part of the questionnaire was administered a single time during the on-boarding phase. Heavy drinkers were excluded from further study engagement due to the primary research questions focusing on the under-engaged light to moderate drinking population. Utilizing the AUDIT questions follows the current UK NHS guidance around standards of care. The question was as follows: "How many units of alcohol do you drink on a typical day when you are drinking?". The modified answer options were: 0 to 2, 3 to 4, 5 to 6, 7 to 9, 10 or more, Unsure- I don't count, Unsure - I don't understand what a unit is (see Appendix A).

The second part of our questionnaire relates to "Online Shopping". It serves to better understand the purchasing patterns of those shopping for alcohol on online grocery shopping platforms. The questions cover the frequency of shopping, the products purchased, reasons for purchasing, and differences in alcohol purchased online and in-store (see Appendix A).

The third part of our questionnaire relates to "Agency and Empowerment in Online Health Interventions". It serves to better understand the engagement patterns of light to moderate drinkers with other health interventions online (see Appendix A).

The fourth part of our questionnaire relates to "Demographic Information". It serves to better understand and contextualize information from previous sections (see Appendix A).

3.2 Stage 2: Interviews

Participants within the low and moderate drinking groups found in the on-boarding questionnaire were invited to attend an interview to share thoughts on the development of an alcohol tool-promoting agency. This came from previous work showing the benefits of framing future design tasks in the context of agency and empowerment [89]. Interviews were conducted virtually on Microsoft Teams and Zoom. The interviews were split up into three sections. Questions were presented on a Miro board [101] completed with visual aids as relevant (see Figure 2).

- **Section 1: Implementable Interventions** We presented the participants with five screenshots of possible interventions taken from [142]. Each intervention was introduced with a two-sentence description. We use those as a probe to provoke thoughts and suggestions on the interventions one by one and invite participants to think about different design possibilities. The screenshots ranged from warning banners, sort functionality, priority listening, warning labels and shopping basket exchange.
  - **Intervention 1:** An alcohol Warning Banner (Figure 2 a) that has specific health messaging designed to be engaged at the basket summary page to not obstruct shoppers and interrupt their product selection process, but rather give them the opportunity to engage with a five second brief intervention before completing their purchase. The five second time frame utilizes familiar imagery from YouTube advertisement skipping

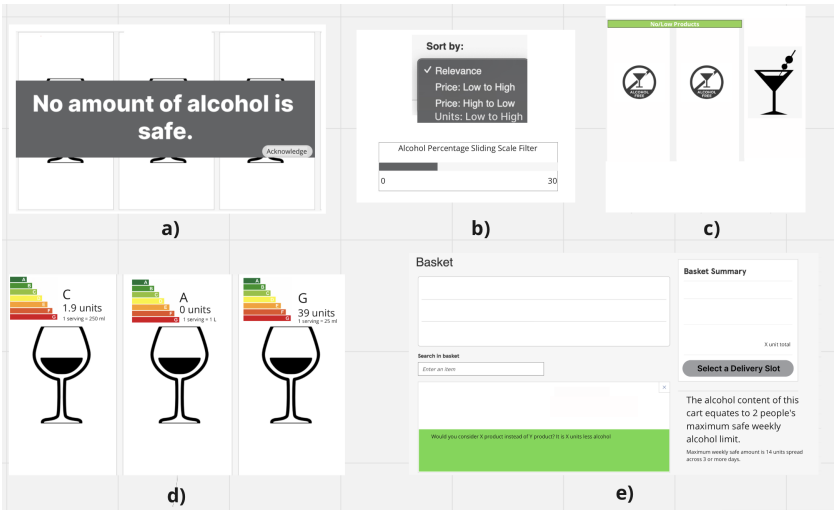

Fig. 2. Five Intervention Designs: (a) Intervention 1 - Alcohol Warning Banner, (b) Intervention 2 - Unit Sort Function, (c) Intervention 3 - No/Low Alcoholic Product priority listing, (d) Intervention 4 - Unit Warning Label, and (e) Intervention 5 - Swap Function.

designs [149]. The specific messaging was developed by combining the messages from many alcohol harm focused papers [32, 33].

- **Intervention 2:** A unit Sort Function (Figure 2b) included the option to sort by "units: low to high" and "units: high to low", with the aim of improving difficulties in product comparisons [31].
- **Intervention 3:** The No/Low alcoholic product priority listing (Figure 2 c) proposed to have no/low alcohol products before their alcoholic equivalents was also prototyped. This is to better counter the difficulty in product comparison [31].
- **Intervention 4:** A unit warning label (Figure 2 d) enabled participants to consume a one sentence summary of the alcohol harm work coming out of the UK in the past five years without it disrupting the task of grocery shopping. This is to counter obstruction and visual interference [37, 93].
- **Intervention 5:** A swap function (See figure 2e) provided health-promoting product swaps. This method used accept/decline options and bright colors to allow shoppers to identify and subsequently engage with the proposed product swap (Figure 2 e). By limiting the choices, the scaffolding was done to best facilitate decision making by utilizing choice architecture [6, 98].

- **Section 2: Alcohol Intervention and Digital Health News** Two recent news stories were shared with participants to prompt discussion on the current state of alcohol interventions and digital health in our target country. This priming exercise was done to maximize the elicitation of information from a small sample size [43]. The area of interest of the study was the UK population and it was important to get responses centered around the UK. The first news story entitled: Blackpool scaffolder ordered to have booze-free Christmas and New Year, was presented with the first paragraph for context [34]. The other story was dealing with the impact healthy choices on private health insurance premiums, examples in this article included being smoke free and walking over 7,000 steps per day [143].

- **Section 3: Implementation and Functionality Questions** Participants were presented with eight questions split into two groups. The first seven questions had five sticky notes presented below them on the Miro board (Figure 3 with the final question having a blank white rectangle labeled Alcohol Tool. Four questions were presented at a time and participants were invited to select questions to answer in any order they desired. The researcher would type the answers to the questions as the participant answered. After the interviewee finished answering the question the researcher would ask if they felt the sticky notes accurately captured their thoughts. Participants were invited to elaborate as they felt necessary using reflexive interview methodology [111]. These questions served as a guide for their co-creation of the tool as opposed to getting design input. These questions focused more on functionality of the tool. The eight interview questions were as follows:
  (1) How do we implement this tool?
  (2) How likely are you to use the functions of this tool?
  (3) What information do you expect the tool to give you?
  (4) Who is this tool for?
  (5) What would make using the tool helpful to you?
  (6) How do you feel this tool would impact your ability to complete the purchase?
  (7) What would make you want to keep using the tool?
  (8) What would this tool look like?

We asked these questions to gather comprehensive feedback about a proposed tool. The first question aims to gather insights on the feasibility and complexity of building the tool. The following question focused on whether the tool's functionalities align with user needs and preferences. The next question focused specifically on useful data presentation with an emphasis on making the data presented to users useful and actionable. The next question was used to gauge who the participants thought the tool was for. This was to better understand whether participants selected specifically because of their status of light to moderate drinkers identified themselves in those terms. The next question drilled into personalization features that could be implemented. The question about the ability to complete the shopping transaction served to further reinforce the context in which the tool would function, reminding participants of where interventions would be housed in the digital ecosystem. The second to last question was user motivation and retention focused. The final question served as an opportunity for participants to give design inputs as they saw fit.

3.3 Participants

Participants were notified of the study via adverts placed within various community groups on Facebook, Reddit, and a survey exchange platform which resulted in participants from around the UK. Before completing the on-boarding questionnaire, participants were asked to complete a virtual consent form via Microsoft Forms and encouraged to email the researchers with any questions or concerns.

37 participants initially consented to take part with 37 participants completing the on-boarding questionnaire. Of the 37, there were 14 declarations of interest with 11 completing the interview portion of the study. Each interview was scheduled to be an hour and for their participation, participants were offered compensation of a £20 shopping voucher.

All participants were over 18 years old. The oldest participant was 51 and the youngest was 21. The median age of this set of participants was 26. The gender identity of the participant pool was: 13 self-identified male, 22 self-identified female, 1 self-identified non-binary, and 1 participant preferred not to state. The interviews were completed by 5

self-identifying male and 6 self-identifying female participants. None were on the clinical pathway for alcohol use disorder as shown by the AUDIT.

3.4 Data analysis

The data collection occurred in both stages of the study. The first stage provided mostly quantitative responses to multiple choice questions centered around drinking habits with optional short response questions to clarify responses. Demographic data such as age, gender identify, and ethnicity were collected to better contextualize responses.

The video recording audio from the interviews was transcribed via automatic transcription available in Microsoft systems. This audio was then listened to while correcting the transcript so that it was as accurate as possible. In cases of confusion, the interview Miro board was utilized to understand terms and phrasing used by the participant. The corrected transcript was imported into Nvivo 2020. Reflexive thematic analysis was used to determine keywords of interest which were then coded [29, 36, 103, 127]. Thematic analysis (TA) was chosen as the method of analysis as it allowed for comparison of participant input while referencing and reflecting on the TA process via working through the common problem guide for TA [30]. These codes would then be grouped into themes before being interpreted as part of this study. Previous studies in online alcohol cessation work utilize theme-code mapping with a wide range of middle sub-themes [54].

The initial step in the analysis involved open coding, where significant phrases and concepts were identified across transcripts. During this process, key quotations were also highlighted for later paper inclusion. Following this, codes were organized into potential themes, allowing for a more structured interpretation of the data via theme-code mapping. Themes were refined through constant comparison and iterative analysis, ensuring the identification of coherent and representative patterns. This stage of refinement led to the development of parent themes and sub-themes.

Note, for the data to be anonymous, all participants were represented by a random number between 1 and 11 and their personally identifiable information was removed, which is also why we opted not to provide a detailed table with participants general information.

4 QUESTIONNAIRE RESULTS

There was uncertainty in how many units were being consumed. This was in part due to a lack of understanding in what an alcohol unit was [100, 123]. This confusion around the meaning of UK alcoholic units is something later supported by interview responses. Participant responses to "How many units of alcohol do you drink on a typical day when you are drinking?" from the AUDIT in the On-boarding Questionnaire were as follows: Eight participants responded zero to two units, eleven participants responded three to four units, six participants responded five to six units, six participant responded seven to nine units, one participant responded ten or more, four participants responded they were unsure because they didn't count units, and one participant indicated they don't understand alcoholic units.

Participants were then asked about encounters they had with passive health interventions online. They were first asked, "Have you encountered passive health interventions online before?". 25 participants indicated they had seen passive health interventions online before, and 12 indicated they hadn't seen not seen any. The next question was, "Did you change your behavior after seeing this health intervention?" 3 participants indicated they had changed their behavior after seeing the passive health intervention, and 22 indicating they hadn't. Content analysis of the justifications for change focused primarily on health, but one participant cited nightmare-inducing fear brought on by learning of the health consequences of alcohol as a child. Specifically, P1 explained,

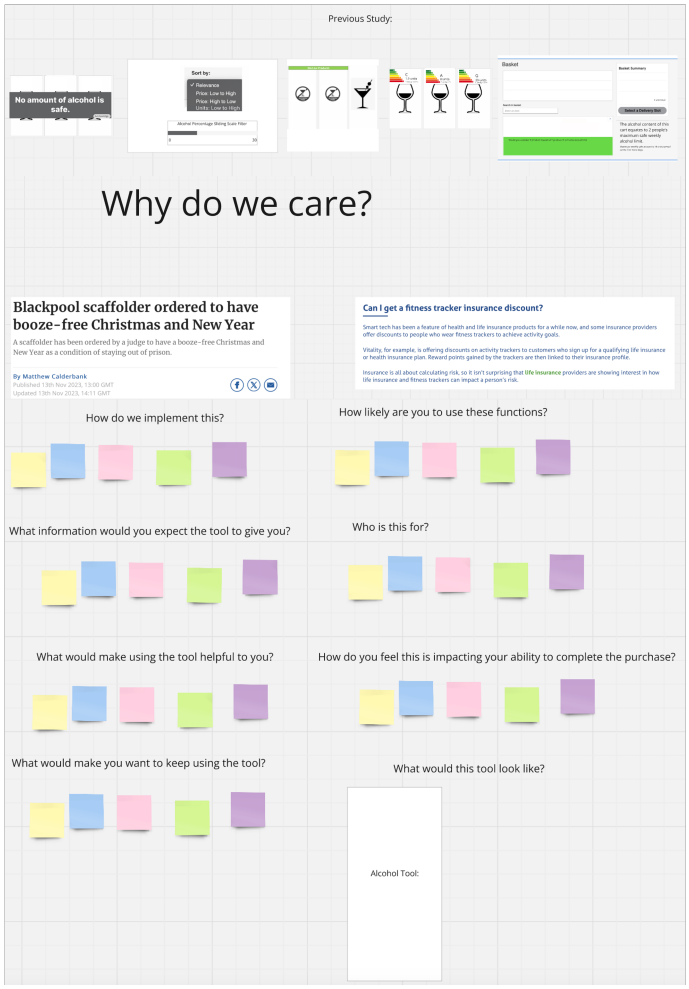

Fig. 3. The Interview Environment on Miro

> *I don't smoke or do drugs, but the alcohol adverts on the TV used to scare me as a child (there was one especially about finishing off bottles of wine unnecessarily and how this can lead to brain cancer that would give me nightmares).*

Participants were asked to indicate what type of alcoholic products they purchased: 24 purchased wine, 15 purchased spirits, 21 purchased beer, 15 purchased cider, 8 purchased pre-mixed cocktails, and 5 purchased alcohol products otherwise classified. Participants purchased alcohol for a variety of people: 18 purchased for themselves, 21 purchased for family, 16 purchased for friends, and 2 purchased for colleagues. Participants were asked how many alcoholic products they purchased in their average grocery shopping trip: 22 indicated they purchased between zero and two products, 6 indicated they purchased between three and five products, 4 indicated they purchased between five and ten products, 2 indicated they purchased between ten and twenty products, and 2 indicated they purchased over 20 products. Participants were then asked how often they purchased no or low-alcohol beverages: 15 selected never, 17

selected less than monthly, 3 selected monthly, 1 selected weekly, and 1 selected every shopping trip. Participants were asked about differences in their online and in-store alcohol purchasing: 25 indicated they purchase less alcohol online than in-store, 7 indicated they purchase about the same amount, and 5 indicated they purchase more alcohol online than in-store. The significance of the on boarding questionnaire was understanding what was purchased online and with what purpose, and subsequently if and how those purchases differed from their physical shopping counterparts.

This on-boarding questionnaire helped us identify light to moderate drinkers we wanted to invite for an interview. We also noted any previous interactions people had with health interventions in the online context as it helped us better understand preconceptions and potential biases that may come up in the interview portion of the study.

5 THEMATIC ANALYSIS RESULTS

We present here the themes and sub-themes reflectively generated during the thematic analysis. The first author completed the coding. The codes were then organized into sub-themes and reviewed by all authors to establish themes.

5.1 [Theme 1] - Goal of Improving Health and Wellness

7 participants wanted to improve their health and wellness in conjunction to co-morbidities they were facing. Two sub-themes which supported this theme were: Paths to Responsible Wellness Choices and the Mixed-Messaging Around Co-Morbidities.

Paths to Responsible Wellness Choices: The paths to responsible wellness codes captured all the conscious, methodical health decision making codes. Making responsible wellness choices comes from informed decision making [57]. The way this information is displayed and communicate is specific to the path they have selected for their wellness journey. P2 wants to be able to compare products,

> *I can click another button and I can click compare and it then puts these in the little rank graph and maybe a picture of the alcohol product next to a little bar and then I can see the chosen variable and it will give me the options and they'll be colored as well.*

In this case chosen variables would help P2 make decisions on what they purchase based off the visual data they get from the tool. P6 was more interested in cumulative data collection,

> *I'm gonna go like here. Very speculative, but all your previous data, everything or everything you've drunk, like during the whole year or something already. All the units of alcohol you have consumed in during the year or for your whole lifetime and you will be like holy ****.*

The shock value resonated with them in the review of their holistic health journey. Others such as P3 were interested in adopting usage summary formats from other services,

> *Maybe it could also be quite fun is if you did like a Spotify Wrapped kind of thing at the end, you know, like or maybe a month monthly one to, like, encourage people that, hey, you know, over this period, you saved this number of calories, reduced your alcohol consumption by X amount, but you know all of these like kind of like really cool stuff that you could I think list cause this quite a good achievement.*

For P3, their health journey also involved some amount of calorie tracking they felt was important in making those wellness choices. Participants cited improvement in their health while consciously monitoring it as really important to them. P4 expressed,

> *I'm if by using this tool, it improves my health condition and monitoring has been improved. I could see some progress in some way.*

There was a general awareness that taking active steps to monitor health through calorie counting and food dairies was helpful in supporting wellness through diet. The value of tracking alcohol in this way came from getting more accurate view of how many calories the individual participants were drinking. **The Mixed-Messaging Around Co-Morbidities:** The mixed messaging around co-morbidities captured all the codes that represented pain points around cross-referencing health messaging. Smoking and prescription medication were frequently referenced as points of confusion for participants. One participant (P1), said it was not possible to purchase cigarettes via online grocery shopping in the UK. A search in some of the online grocery shopping platforms shows otherwise.The discussion led to the mention of there not really being smoking interventions online. On online grocery shopping platforms the smoking cessation packaging is clearly visible along with banners and boxes with smoking cessation information. This misconception was important to understand associations users would have within the health intervention context. Smoking was brought up by half of the participants. Smoking and drinking are associated lifestyle addictions which have been previously studied together [21, 77]. The associations between tobacco and alcohol products purchasing led to tangents comparing the perceived harm or perception of social status. P1 explained,

> *I'm biased coming from the UK where I don't see alcohol as bad of a thing as smoking or drugs like in my mind alcohol is not as adverse to the health, even though it probably is. Everyone I know drinks loads of alcohol.*

Similarly P4 reflected,

> *Somehow daily products, so we don't see how impactful it is, it's and I think it's quite maybe similar cigarette but umm alcohol this feels like cool, cigarette is not.*

A secondary point of confusion came from health messaging from the clinical space. P5 described,

> *If I was drinking heavily on benzodiazepines, that's a that's a I will die kind of thing. I haven't really been given that particular message before of how dangerous they are. I think that for me, it's been, I've been basically been bounced around various doctors, various amounts of time and there's kind of there was, you know, was on the box, don't do not drink with alcohol on these, but I've always kind of been told, oh, don't drink with alcohol on these.*

Consuming alcohol while on benzodiazepines puts people at risk of death [59]. On the journey to health and wellness, a high risk of death should be clear, but the messaging around it has been unclear due in part to failures from trusted medical professionals. The severity of risk not being explicitly explained in an understandable way leads to misconceptions about how safe it is to consume alcohol even in the light to moderate range.

5.2 [Theme 2] - A Strong Wish to Have a Tool that Fosters Motivation through Personal Empowerment

Getting people to use an alcohol reduction tool before it becomes clinically required is a challenge. There is the mitigation of patient autonomy and long term health benefits. To better understand how to motivate people, the central idea of empowerment was important and a concept carried across all the sub-themes: the illusion of autonomy, personalized decision-making, and empowered authenticity.

The Illusion of Autonomy: The illusion of autonomy encompassed all the codes that represented a false sense of control. These included the feeling of being controlled, limitations of choice, and triggers. Some participants even highlighted how they would attempt to counter interventions that made them feel like they were being controlled. People self-manage information intake with self-filtering [49]. P8 explained the practice happens habitually,

> *I probably would ignore it because that's usually where like the terms and conditions pop up or like if you cancel this, you don't get anything back or whatever.*

P1 reinforced this,

> *I feel like the things that you couldn't choose that would just be there, you'd just end up just filtering it out with your eyes.*

An approach to addressing this information filtering is presenting the information in a way that is widely digestible [13]. That information could involve the weaving of clinical expertise into a new, more accessible format [66]. P6 described the importance as,

> *It just sort of just understanding how people perhaps navigate information in different formats and ways, perhaps sort of the familiarity of that, something that already exists.*

Some participants expressed hesitancy around being forced into adopting the tool [71]. The background of why there were concerns came around the implications of agency and empowerment in engaging with the alcohol tool. P7 viewed the inclusion of an alcohol tool by default into existing online grocery shopping situations as,

> *I mean, in terms of somebody's empowerment, since you are taking away the will of somebody, it's going to be disempowering, almost by definition, right?*

Personalized Decision-Making: Personalized decision-making represented all the codes that centered around tailored, individualized attention participants saw around decision making processes. Personalization in health messaging has been explored across a range of other applications [50, 65, 107]. The perceived challenge is deploying that at the scale of the light to moderate drinking population of the UK, in this case, those purchasing their alcohol on online grocery shopping platforms. A method of supporting personalization came from P10 who felt this degree of personalization could come from,

> *How you could toggle on or off the possible feature.*

By giving control of features to users, the burden of tailoring the interventions rested on the individuals using the tool. But as P8 pointed out this carried risk,

> *It's very like nuanced. Like is it a good idea or is it an awful idea? I think it's perfectly an awful idea, but it's like some people don't want that information so being able to toggle it on and off is like, oh, you can see the calories and the units in these things.*

The personal context of the user will define what their goals will be from using the alcohol tool. A person in AUD recovery will have different habits to someone who has always drank just under the weekly limit [23].

P9 looked at the decision-making as starting with the choice to even begin using the tool,

> *I think if it's in the context of like a grocery's app and you have people consenting to be in beta groups and people who don't want that, then it's completely fine to roll it out to groups of beta testers and see and get their feedback on it and see what they absolutely hate and what they don't mind.*

Empowered Authenticity: Empowered authenticity held all the codes that associated authenticity with empowerment. The motivations of users factor into getting individuals to engage with the proposed alcohol tool and may go as far as predicting outcomes in engagement [20]. The actual motivators for different participants varied. P5 explained it as,

> *When I'm trying to work towards something I get fixated. I look at the mountaintop, as opposed to the next steps. Something that is saying these are the achievable things you can do and it's better to focus on the small, achievable things and get a few wins under your belt.*

For P5 motivation came from the small wins to keep going towards the goal they were fixated on. P3 also felt motivated by checkpoints, but found that tying the small wins to big-picture, planetary impact made even the small wins seem more impact. P3 described an example,

> *That would update the text is not right like how much alcohol you saved, your carbon footprint has decreased, you save the planet. That is like the feel-good thing it's not just about me reducing.*

The authentic goal setting from the personalization aspect leads into greater feeling of empowerment.

5.3 [Theme 3] - Challenges of Facing Social and Cultural Context of Alcohol Consumption

Drinking culture varies widely around the world and has been widely studied [62, 92, 132]. If anything, it means the wish list of functions and the limitations of those functions could vary across different cultural groups. From a personalization perspective it is a top priority to address those difference, but from a design and implementation perspective it makes it challenging to roll-out a health intervention on a global scale. These challenges are supported by the sub-themes of drinking culture and policy, circle of influence, and uncomfortable reactions to change. These rules of engagement will vary culture to culture and will be the least generalizable to other use cases.

Drinking Culture and Policy: This sub-theme encompasses perceived corporate greed as far as getting online grocery shopping platforms to embed the tool into their platforms. Current policy around alcohol signposting in the UK is unclear, with one organization Drinkaware selling a Logo License for the purpose of, "Use of the logo is a widely recognized way of demonstrating an organization's commitment to promoting the UK Chief Medical Officers' (CMOs) low risk drinking guidelines. The Drinkaware logo and branding is seen far and wide across the UK, with hundreds of companies demonstrating their commitment to reducing alcohol harm in the UK by using it. "We are recognized by both Government and consumers as the leading source of information regarding alcohol harm." [2] The usage of this logo is not compulsory. As P7 pointed out,

> *Websites are not going to sign up and do this themselves. Alcoholics are incredibly lucrative customers for them. You get old X who loves wine and has a book club where they all drink wine together, and she gets that through Ocado. Ocado, are gonna want to keep her as a customer because she is buying all the Shiraz.*

The drinking culture in the UK is one heavily tied to the pub and binge drinking behavior [96] [67]. There is evidence from our interviews that while yes this online grocery shopping situation is important, the pub was more of an area of interest. P5 wanted something to connect to other UK-based drinking venues,

> *I was just thinking that I'm sure you could do something similar with a smartwatch where if an order was placed through an app that on your on your phone to a, let's say Wetherspoons and share the data with with the tool that we've got, you'll be able to effectively measure how many drinks you've had.*

This difference in on-site and off-site drinking could tie into whether or not the UK population identifies themselves as a light to moderate drinker. Aside from P5, none of the interviewed light to moderate drinkers mentioned the pub as where they consumed alcohol. **Circle of Influence:** The circle of influence goes beyond stakeholders, but rather addresses the perceived target audience as evidenced by the associated codes. The purpose of this study was to engage light to moderate drinkers, but light to moderate drinkers were not recognizing themselves as the target user group despite being selected for the interview based on their self-reported drinking habits and being told this was an intervention for light to moderate drinkers. Participants were inclined to "other" the user base they identified for the alcohol reduction tool. Othering is not uncommon in the space of health services [73]. Participants, despite being identified via the on-boarding survey as intervention targets due to their low to moderate drinker status, did not consider themselves a part of the target audience. P10 explained,

> *It more of a financial thing as opposed to a stopping or limiting alcoholic intake because I don't have a high alcoholic intake anyway.*

P4 affirmed,

> *This is not for myself, but if I purchase the products to the other people, I definitely use it more.*

Out of the 11 interviewed participants, only one participant (P5), viewed themselves as a member of that target group.

Looking at the wider stakeholders there were concerns that the tool was going to collect the data and subsequently sell the data. Concerns around who was going to benefit, or attempt to gain access were cited. P1 explained,

> *I'd be cautious of it sending, you know, like putting on your medical record or something because as the NHS becomes more privatized, they'll probably start to become more discriminatory.*

This concern highlighted the value of the data used by the tool by other stakeholders in the UK alcohol market.

Uncomfortable Reactions to Change: This subtheme centered around the codes depicting the very human reactions to change. The cost of living crisis in the UK has deeply impacted grocery shopping habits [80, 148]. The cost of alcohol was frequently cited as a reason to utilize promotional deals and purchase potentially lower alcohol products. Some participants highlighted the grocery shopping setting where shrinkflation has impacted staple products and thus the perception of appropriate servings [42]. P8 described an experience,

> *I thought ohh it's cheaper, it's a more appropriate size bottle maybe? I don't want a litre. Maybe I want something smaller and the low alcohol comes in a smaller and it would make me think about it.*

The uncomfortable reality was that people were re-evaluating their drinking based off of the economic pressures felt when shopping for their weekly sustenance.

5.4 [Theme 4] - User-Centered Design Enhancing the Usability and Effectiveness of the Tool

User-centered design has been integrated as part of the alcohol tool development process by way of conducting this study and studies before it. By using it in every step of the design process the goal is to develop a tool that is adopted by the target audience [41, 85, 97]. This theme was also supported by participants of this study who cited ideas that were later categorized under the sub-themes: optimizing user experience and data efficiency, usability of tool, and the dynamics of consumer behavior.

Optimizing User Experience and Data Efficiency:

Optimizing user experience and data efficiency encompassed all the codes that were specific design suggestions. Particular interest was on what platforms an alcohol tool like this would exist on as optimizing the tool accordingly. As pointed out by the Challenges of Facing Social and Cultural Context of Alcohol Consumption theme, online grocery platforms are more likely to implement a tool for alcohol reduction if there is a government policy requiring it. P10 suggested a roll-out potentially bypassing policy,

> *A Google Chrome extension or a web-based extension browser?*

This was reiterated by P11,

> *Maybe something like a Chrome extension that people can download. You know, sellers don't do it voluntarily.*

This suggestion left the alcohol tool in the context of web-based online grocery shopping.

Others were interested in how product data could enhance in-store shopping experiences as well. P8 was planning an in-store companion tool,

> *When you're in shops, they could have some info, little guns, the little scanning apps that you use and could also give you some information as well, because that would be quite a cool way people in person to use it.*

This notion of an in-person companion tool development highlighted the importance of coherent grocery shopping technology design [137].

Usability of Tool: The usability of tool sub-theme captured codes concerned with the practical use of the tool. The experiences across different shopping platforms determine customer loyalty [126]. P10 described,

> *Because thinking about it now, once you're doing your, when you're doing it online shopping for me anyway, kind of entered like this flow of doing it, and if it's interrupted, you kind of like you halted a bit, which is kind of what I think the first one would do, which in fairness it's what it's designed to do, bring it to a full stop. It shouldn't ruin the experience, so to speak.*

P6 reinforced the nature of a ruined shopping experience,

> *I think I will extremely be annoyed and I would potentially leave the website because it just does not let me purchase. So I will find it like a very annoying. Umm. Kind of mosquito buzzing on my ear and I would just be like, ah, **** it. I won't purchase here sort of. And I would maybe go to a physical shop where there are no messages telling me to reduce my alcohol.*

If the tool interferes too much with the end goal of completing the grocery shopping people will not use it or will change shopping platforms altogether. A well-designed tool that supports user goals, completing the grocery shopping and the goal of Improving Health and Wellness (theme 1), should be the intended output of this work.

Dynamics of Consumer Behavior: The dynamics of consumer behavior sub-theme was made up of codes focusing on the motivators and pain-points that influence consumer behavior. Consumers get bored of sameness [131]. A possible approach to mitigate the issue is the dynamic presentation of the information as suggested by P2,

> *So maybe just updates on style and contrast so things look different because when something stays the same for too long, you become bored with it and you don't realize it's impacted enough.*

It's a small change that makes a difference in how the experience is perceived. These changes however need to be heavily tested before deployment as too much change too frequently can lead to user confusion and frustration [79].

6 DISCUSSION

The magnitude of healthcare burden stemming from alcohol is not decreasing despite digital resources being available. The most recent alcohol harm models indicate that over the next 20 years within the UK alone there will be over 200,000 additional alcohol attributable hospital admissions and over 7,000 alcohol attributable deaths [16]. This would carry an additional cost of £1.1 billion to the National Health Service (NHS) compared to if drinking had remained at pre-pandemic levels [16]. In this paper we particularly focused on the light to moderate drinkers which are often overlook in designing intervention for better consumption and prevention of more serious effects.

We found the goals of light to moderate drinkers center around improving health and wellness. These users are also motivated to use a tool that fosters motivation through personal empowerment. When engaging these populations, the social and cultural context of alcohol consumption has to be addressed. Ultimately incorporating user-centered design elements would help this population to improve the usability and effectiveness of the alcohol reduction tool.

6.1 Guidance for Alcohol Tool Designers

This study and the interpretations of the results can be presented in the form of a design insights for alcohol reduction tools designed for low to moderate drinkers.

The challenge of working with the light to moderate drinker group is that some of the participants do not want to reduce drinking as it is not at what they perceive to be a dangerous level. This design guide serves as a supplement to existing models, such as the extended parallel process model, which highlights the three central factors of message, behavior, and audience as the pillars of public health interventions [114].

The question around selecting culturally and socially relevant information to present the light to moderate drinking population is only addressable through through demographic and pre-screening data collection. Even within the UK there are different alcohol policies which impact alcohol purchasing behavior including minimum unit pricing (MUP) which has rolled out in Scotland, but not in England [109]. Differences in social and solitary drinking behavior have been previously addressed with other frameworks and can be used in conjunction with the design guide to better specify the intervention [40]. This can lead to the development of more tailored interventions which feed into the larger subject area of personalized preventative healthcare [27, 141].

The conceptual model behind the design guide comes form the themes and sub-themes we identified as part of the thematic analysis (see Figure 4). The significance of using the themes as essential components of the conceptual model is to give metrics for success beyond net decrease to alcohol purchasing via the usage of the tool. The alcohol reduction tool needs to be functional and successfully implemented to be a proof of concept for future legislation in the area of alcohol purchasing in the UK. These logistical questions determine to what extent alcohol reduction interventions like those present in the tool can be implemented in the wild [118].

This design guide considers variables brought from individuals' lived experience and specified motivation (or lack thereof) to engage in alcohol reduction despite not being a clinically engaged drinking category. These variables are so significant that they are referenced in both the successful implementation and functions of alcohol tools section of the design guide. The design guide considers UK policy on drinking, but could be adapted to local drinking policies that may include alcohol-selling monopolies such as those in Canada, Finland, Sweden and other Nordic countries [108].

The effectiveness of the design guide can be evaluated by supporting these qualitative inclusions with quantitative feedback. These quantitative factors include (but are not limited to): reduction of alcohol purchased (either as a percentage or number of products), product swaps accepted, number of completed purchases, time spent customizing

Fig. 4. Conceptual Model for Designing an Alcohol Reduction Tool for Light and Moderate Drinkers

the tool, and the number of active users of the alcohol tool. This data is collected via user reflections, shopping data, and downloads of the tool. Analyzing this quantitative data depends on the size of the user base and the normal or non-normal distribution of the data set. A paired T-test would lend itself to the comparison of pre-tool alcohol purchasing and post-tool alcohol purchasing. The design guide itself serves as a reminder of what the central goal of the work is and all of the important factors to consider from a logistical perspective. It serves as the "how do we arrive" to the central goal, which is the development and deployment of an alcohol reduction tool for an under-engaged population.

To apply the design guide the following steps must be taken:

(1) Identify the primary goal of the work as an alcohol reduction tool for low to moderate drinkers.
(2) Consider the priorities of the user population before developing the tool.
(3) Plan to evaluate the tool on the basis of health tracking ability, the responses to the interventions, the perceived relevance of messaging, and the functionality of the tool.
(4) Analyze the qualitative points listed above via content analysis.
(5) When trying to justify a potential policy change, determine what an adequate proof of concept is. A proof of concept could be a prototype or an entire randomized trial. This is determined by the scope of the policy output the project aims to have.

The feedback mechanism to further improve this design guide beyond this study is to publish this first study and have other researchers and designers engaging with light to moderate drinkers apply it to their design contexts. Every iteration of this design guide being utilized will be recorded and added to the body of literature supporting the development of preventative tools for the non-heavy drinker population. The design guide presented in this paper came from an idea to enhance results from another measure to better suit this specific context.

6.2 Implications for Motivating Other Public Health Engagement Online

The deployment of public health interventions around alcohol have previously been focused on limiting alcohol under sage weekly limits and advertising abstinence and taxation, while more modern approaches encourage alcohol-free environments and no/low alcoholic beverages [86, 117]. What our work found was the issue of motivating preventative health supporting behavior meant acknowledging multiple paths to wellness while clarifying mixed messaging around co-morbidities brought by in-congruent massaging around harm from cultural versus medical sources. This practice is being adopted in some areas of health and well-being but has been mostly focused on drugs carrying legal penalties [17, 81, 106].

There is interest in tools that support health and wellness, but the motivation to use these tools has to come from personal empowerment as far as our participant group was concerned. Logistically this means acknowledging long standing illusions of autonomy in public health, the personalization of health decision making, and feeling empowered to live authentically. These disconnects between public health and autonomy come originate at an issue of legal limitations on what is and what is not considered health care for the public. This is a topic that has come up globally in discussions around abortion in the United States [22, 95], but also the right to euthanasia and physician assisted suicide [83, 84]. The ramifications of the illusion of autonomy include (but are not limited to) health tourism [64, 136], legal punishment of those seeking unsupported treatment [129, 144, 147], and defining and redefining of medical procedures by governments and health insurance companies alike which can go as far as to dictate where said procedures are "approved" [26, 60, 124]. Technology itself isn't this magical one-size solution, any sort of digital tool made for the public good needs to understand the limitations of the technology itself and not view it as a cure-all and equalizer [75] for the previously stated issues which stem not from technical limitations rather moral and ethical disagreements that have encroached on what it means to make empowered healthcare decisions.

Any sort of digital intervention for public health needs to identify the social and cultural context of the health topic being addressed [24]. This determines elements such as target audience of what is being communicated [45], the dissemination channels [56], legal limitations [14], and the potential for a poor public reaction [38].

User-centered design was paramount to making a health tool that worked as far as our participants were concerned. From a design perspective this means taking the time and making a tool that prioritizes usability via an optimized user experience [48, 58, 61, 146] and efficiency in data usage [145] [110] while being dynamic and adaptable to the changing interests [74], behaviors [88], and attention spans of the population [120].

Health technology and how humans engage with it becomes a tech and an HCI problem when researchers and corporations alike fail to critically reflect on the complexities and full range of what living well looks like for a large population. If there isn't one-size-fits all solutions for other tech [130], public health facing technology and digital interventions have to again balance the diversity of the population with what is achievable to deploy. This paper adds to the body of literature that dissects human motivations in engaging with digital (and not tangible) interventions in the healthcare space.

6.3 Limitations

Over the course of the interviews the idea of the purchasers of the alcohol not being the consumers of the alcohol was repeated. The participants cited elderly loved ones as primary reason for this trend. The purchasing on behalf of elderly loved ones is an encouraged practice in the UK with online guides existing for the elderly to access a range of support in the practice [1]. In this case the opportunity of the purchase point being a brief intervention is nullified. There exist other opportunities for drinking interventions to happen either in conjunction with visits to NHS services or in community care systems.

The study was conducted prior to the holiday season. As part of the data set there are frequent mentions of the holiday season and familial drinking habits. Previous studies conducted at different points in the year did not have significant mentions of alcohol gift-giving or familial traditions, all of which were coded for in this data set. This could have in part skewed the "othering" sub-theme.

Not running the interventions live on existing online grocery shopping platforms is a limitation [118]. "In the wild results" may vary to those found in this study. The results of this study however better support our future deployment of an alcohol reduction tool.

App-based grocery delivery was excluded from the study on the basis that there are inherently geographical limitations to delivery region and grocery chain engagement in those services. This does not mean app-based ordering does not warrant consideration, but the context of this particular study and this data set centers around web-based online grocery shopping.

Participants were encouraged to explain their purpose of alcohol purchasing. Out of the surveyed population there were none that cited large scale social events such as weddings, church mass, and house parties. This participant group also didn't acknowledge price sensitive elements such as discounted prices as a motivator of purchasing despite that being a major motivator in previous studies conducted with a similar participant group [142].

Despite some priming done in the beginning of the study, alcohol technology priming was not done to influence participants in responses. There was mention of alcohol smartwatches from some participants which already exist on the market [35]. The intent of the study was to find more novel approaches in the area of alcohol technology. There is a delicate balance with participant priming and delving into specific alcohol technology was not done to prevent highly coached answers in the interview, this however led to some responses which covered already existing technology.

6.4 Future Work

Future work should look at application-centered ordering as there is little variance between the user interface of different shops on application-based delivery services, but there are limits to the ability to develop extensions to function on top of those interfaces. Considering the rapidly evolving alcohol legislation in the UK it would be worth running this study after the deployment of new in-store alcohol purchasing changes such as the proposed AI face scanners for age verification, which could lead to changes or shifts in alcohol purchasing behavior to an online platform [99]. Future studies could also look at parts of the UK where minimum unit pricing and the reintroduction of public health levies on alcohol (Scotland) are in place [113]. Future work should also engage in validation of the participant provided input from this study. Further work needs to be done to compare on-site and off-site drinking in the UK and how that aspect impacts individual perception of drinking levels. Most of this cohort of participants did not identify themselves as light to moderate drinkers despite self-reporting drinking in that range, but most of them also didn't drink in pub or restaurant venues and were more likely to drink in their own home or that of a friend or relative.

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A APPENDIX A - STAGE 1: QUESTIONNAIRE QUESTIONS

Part 1 - The AUDIT For the safety and wellbeing of you and the researchers we are asking everyone to complete the standard Alcohol Use Disorders Identification Test (AUDIT). This was developed by the World Health Organisation (WHO) and serves as an early detection tool for hazardous drinking behaviour. This is here as a safeguarding tool for you to understand your own drinking habits before continuing on to the rest of the questionnaire.

(1) Are you over the age of 18?
(2) How often do you have a drink containing alcohol?
(3) How many units of alcohol do you drink on a typical day when you are drinking?
(4) How many times in the last year have the following statements been true? (Statements: I have had 6 or more units (if female) or 8 or more units (if male) on a single occasion in the last year, In the last year I was not able to stop drinking when I had started, In the last year I failed to do what was normally expected from me because of my drinking, In the last year I needed an alcoholic drink in the morning to get myself going after a heavy drinking session, In the last year I have felt guilt or remorse after drinking, and In the last year I have been unable to remember what happened the night before because of my drinking.
(5) Has somebody else been injured as a result of your drinking?
(6) Has a relative or friend, doctor or health worker been concerned about your drinking or suggested that you cut it down?

Part 2- Online Shopping Questionnaire The following questions are about your online grocery shopping habits specifically related to alcohol. Some of the questions have follow-up questions.

(1) How often do you conduct your grocery shopping online?
(2) How many alcohol products do you purchase during your average shop? (Please note a case of beer is considered to be the number of items in the case. A case of 18 beers is considered to be 18 products.)
(3) Who are you purchasing the alcohol for?
(4) What kinds of alcoholic products are you purchasing?
(5) How often do you purchase any no/low products as part of your online grocery shopping?
(6) How much alcohol do you feel like you purchase online versus in store?
(7) Why do you think that is?

Part 3- Agency and Empowerment in Online Health Interventions These questions are here to understand the impact of online health interventions on people. Some of these questions have follow-up questions.

(1) Are you familiar with the concept of agency in the health and wellbeing context?
(2) How important do you think it is to feel in control over actions and their consequences related to your health?
(3) Why?
(4) Have you encountered passive health interventions online before? (Example: smoking harm advertisement on the side of a webpage)
(5) Did you change your behaviour after seeing this health intervention?
(6) What about the intervention made you make a change?
(7) Do you feel that this central concept of empowerment is important in making health changes?
(8) Why?
(9) Do you feel that passive health interventions online should be opt-in? Why or why not?

Part 4- Demographic Questions These questions are here to help contextualise the answers to the previous questions, contact you for follow up studies, and enter you into our voucher drawing.

(1) Please enter your name. Please note we need your name in order to verify that you have filled out the consent form. After you have submitted your questionnaire your name will be replaced with a unique identifier.
(2) Please enter your age (in numbers).
(3) Gender: How do you identify? This is important to collect for the purpose of understanding drinking guidelines developed in the United Kingdom. Previous guidances have had gendered safe drinking limits.
(4) Are you currently residing in the UK?
(5) How would you describe your household?
(6) Are you currently under treatment for alcohol use disorder?
(7) Would you be interested in participating in either of the follow up sessions we have? * Please select the sessions you would like to be contacted about
(8) Please enter your email to be contacted about the follow-up study option(s) you selected. * Putting your email ONLY here does not enter you into the voucher drawing.
(9) Please provide your email below for an entry into our £20 voucher raffle. There are multiple vouchers available. If you are not interested in the voucher you may leave this question blank.

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