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# **Men's Experiences of a Personalised, Appearance-based, Facial-morphing, Safer Drinking Intervention**

## **Abstract**

Risky alcohol consumption behaviours remain commonplace, representing a major threat to health and safety (WHO, 2018, 2023), and are especially evidenced by young university students (NIAAA, 2023). Consequently, new interventions targeting this high-risk group are required. The current study investigated young male university students' experiences of a personalised, appearance-based, facial morphing, safer drinking intervention. Twenty-five male student participants were recruited, aged 18 to 34 years. Inductive thematic analysis of data gathered whilst participants were immersed in the intervention, and thereby exposed to alcohol-aged images of their own faces, produced four primary themes: alcohol as a threat to appearance and health, motivations to protect appearance, motivational aspects of the intervention, and proposed improvements and applications. The results of the current study suggested that participants expressed intentions towards healthier consumption/maintenance of already non-risky intake, supporting the potential of the facial-morphing appearance-based approach to address risky alcohol consumption, even in high-risk groups.

**Key words: ALCOHOL, BINGE DRINKING, HEALTH PROMOTION, MEN'S HEALTH, QUALITATIVE METHODS, INTERVENTION**

## **Introduction**

Worldwide, risky alcohol consumption behaviours remain commonplace, yet underemphasised as a major health risk by physicians (Printz, 2013), and underestimated by the public, as a major source of individual harm (Thomas and Davis, 2011; WHO, 2023). Primary amongst these adverse behaviours is episodic heavy alcohol consumption, interchangeably and more usually referred to as binge drinking (Thomas and Davis, 2011). The British National Health Service (2021) considers binge drinking to be: the intentional rapid consumption of eight alcohol units for men, and six units for women, with the goal of intoxication. Accordingly, risky alcohol consumption is classed as an intentional, and therefore behaviourally preventable, adverse health behaviour (NHS, 2021), and lies third, in the global rankings of nineteen leading behaviourally preventable risk factors, for disability adjusted years (Greenfield, 2013). The World Health Organization (2023) published a statement in *The Lancet Public Health* to state that when it comes to alcohol consumption, there is no safe amount that does not affect health.

Consequently, the collective negative outcomes of risky alcohol consumption constitute a major global socioeconomic burden (Anderson and Baumberg, 2006). This is largely because these negative outcomes frequently extend beyond consumers, and impact other individuals (Greenfield, 2013). The NHS (2022) reported that in 2020/21 a total of 167,000 prescriptions for drugs to treat alcohol misuse were prescribed in England. Given the severity and scope of such findings, risky alcohol consumption endures as a prominent focus of public health efforts worldwide (Knai et al., 2015), and ongoing development of interventions to address these behaviours, remains a crucial requirement (WHO, 2018).

Historically, public health interventions have been primarily didactic, mass-media (e.g. via television, radio, internet) and population-level (Young et al., 2017) in nature, and their usage by Western governments has ensured the health and safety risks of alcohol consumption remain well publicised (Martineau et al., 2013). These interventions commonly assume that: exposure to health risk and protective behavioural information will increase perceptions of individual vulnerability, and thereby elicit beneficial behavioural change, with resultant reductions in adverse outcomes (Stapleton et al., 2017). Prominent recent examples of this intervention approach to address risky alcohol consumption include Change4Life (DHSC, 2013) in England and Wales.

In addition to mass-media interventions, over past decades Western governments have also routinely delivered alcohol risk education intervention measures through the formal school system (Janssen et al, 2013). For example, in the United Kingdom, 95% of primary, and 97% of secondary schools report provision of alcohol education (Milliken-Tull and McDonnell, 2017). As a pillar of socialisation alongside family, community, and the media, the strengths of this approach rest in school's capacity to intervene en masse, prior to, or early in, children's likely exposure to alcohol, to prevent development of adverse consumption behaviours, and respond to instances of harm (Thom, 2016).

However, despite these sustained public health intervention efforts, the high potential for alcohol related harm is persistently misjudged by Western societies (Thomas and Davis, 2011), and risky alcohol consumption remains pervasive (Printz, 2013), with myriad negative outcomes (WHO, 2018). Consequently, notwithstanding demonstrable success in addressing drink driving (Elder et al., 2005), and evidence of some very short-term effects (Young et al.,

2017), these findings and those of numerous reviews, indicate that both mass-media interventions (e.g. Young et al., 2017) and school-based alcohol education (Chisholm, Doran, Shibuya and Rehm, 2006), are not generally effective at reducing alcohol consumption, adverse alcohol health behaviours, or resultant negative outcomes.

Appearance-based interventions may represent one such alternative approach (Owen et al., 2019). Characteristically, interventions using this approach commonly aim to starkly demonstrate the negative, yet preventable appearance effects of adverse health behaviours to younger people, and thereby elicit positive behavioural change upon perception of these behaviours as a personal appearance threat (Persson et al., 2018). Sallis et al. (2019) compared the impact of appearance versus health-framed messages on engagement in a brief web-based risk screening and alcohol reduction intervention, and found that the appearance-framed message led to a small but significant increase in the number of users completing a risk screening questionnaire compared to the health-framed message. The effectiveness of the appearance-focussed approach is supported by numerous interventions, successfully applied to issues including smoking (e.g. Walker et al., 2022) and excessive UV exposure (e.g. Williams et al., 2013), and may therefore represent a more persuasive approach, than conventional didactic health-risk interventions (Owen et al., 2016; Flett et al., 2013).

Further support is evidenced by interventions incorporating UV photography (Persson et al., 2017), particularly when using personalised images of participants, to reveal hidden dermal damage (e.g. Walsh and Stock, 2012). Personalised imagery has also been successfully employed by interventions using facial morphing software, to simulate participants potential UV (e.g. Owen et al., 2016), and smoking (e.g. Flett et al., 2017) appearance damage over time.

In light of such evidenced strengths, and a gap in the literature, Owen et al. (2019) elected to investigate the potential effectiveness of the personalised appearance-based intervention approach, to address persistent risky alcohol consumption amongst young women university students. Owen et al. (2019) developed bespoke facial morphing software as an intervention to demonstrate to participants the potential effects upon their own facial appearance of both moderate (safe) and high (or unsafe) alcohol consumption versus normal ageing at increasing age increments from 35 to 72 years. In support of previous studies (e.g. Owen et al., 2016; Flett et al., 2013), Owen et al. (2019) concluded the intervention successfully elicited expressed motivation to reduce alcohol consumption behaviours, in all participants, and consequently that the personalised appearance-based approach has a role to play in alcohol interventions. As women typically experience elevated appearance dissatisfaction compared to men (Grogan, 2021), Owen et al. (2019) elected to focus on young female university students.

However, males, for example male university students, in terms of proximal and distal health risks, are more likely to: drink (DiGrande et al., 2000), drink faster (Dumitrescu, 2007), more frequently (Andersson et al., 2007) and consume more (Andersson et al., 2007). Moreover, 75% of alcohol dependents are male (WHO, 2018), and contemporary men may demonstrate similar susceptibility to appearance dissatisfaction issues as women (Grogan, 2021). Therefore, development of alcohol interventions that are also effective with young males, may be of even greater urgency, and these appearance concerns may also indicate potential male susceptibility to appearance-based interventions.

Consequently, the current study intends to explore this approach further, as an identified future direction of Owen et al. (2019), utilising the same intervention, but instead focusing on young males. The current study aims to contribute useful understandings of male participants' experiences of the intervention and their reactions, plus insights signalling whether appearance concerns are as influential upon men's alcohol consumption attitudes and intentions, as they are on women's (Owen et al., 2019). In accordance with Patton (1990), due to these subjective aims, plus lack of hypotheses or other preconceptions, and the goal to understand, rather than measure these experiences, qualitative methodology was considered most appropriate. Additionally, participants were encouraged to share their reactions, thoughts, and feelings as they occurred, and answer semi-structured questions, whilst exposed to alcohol-aged images of their own faces. This was intended to facilitate disclosure of more spontaneous, relevant, richer, and authentic data, by collection during participants' immersion in the intervention. Accordingly, the research question was correspondingly broad: what are young males experiences of a personalised, appearance-based, facial morphing, safer drinking intervention?

## **Method**

### **Participants**

An opportunistic sample of 25 males were recruited using opportunity sampling (word of mouth and advertising on social media), aged 18 to 34 years ( $M=21.0$ ,  $SD=1.22$ ). No participants withdrew, and all met the inclusion criteria, by identifying as: male, 18-34 years old, and consumers of alcohol, without history of dependency. This sample was larger than Owen et al. (2019) who interviewed 17 participants, and considered ample within the

employed in-depth qualitative paradigm to yield the required quantity, quality, and depth of data (Boddy, 2016).

### **Software**

A laptop with a webcam, or a mobile phone with a camera, was used to digitally capture participant facial images and run the bespoke CMF (Change My Face, 2019), facial ageing morphing software, which constitutes the intervention. By employing simulated alcohol-ageing morphing effects, upon the participant's own facial image, the software demonstrates their potential future appearance, aged naturally at a variety of increments, alongside ageing plus moderate or high alcohol consumption, to afford comparison. Importantly therefore, the negative facial appearance effects of alcohol consumption, may not be confused with, or dismissed as, merely typical ageing by participants. With regards to the two types of software design (mobile and laptop version), the authors initially planned to analyse the two sets of data separately, as they thought that there would be differences in the responses to the larger laptop version, and the smaller, simpler, mobile phone version. However after data collection and initial analysis, the authors found that the participants' responses were similar, independent of which version of the software they used, so the decision was made to combine the data into one dataset.

**Procedure** Prior to the commencement of the study, ethical approval was granted by the Staffordshire University Ethics Committee. The 25 participants individually undertook the intervention in separate sessions, whilst answering semi-structured questions. Questions included: "what did you think about the intervention?", "How did you feel when you were doing the intervention?" and "How did you feel immediately afterwards?". Sessions were



carried out by two of the researchers who are experienced in using the software, and two research assistants, who were fully trained in using the mobile phone version of the technology.

Participants were provided with an information sheet, consent forms, and a participant details form. Unlimited reading and question and answer time was provided. Participants then signed the consent forms and completed the participant details form. Next, via laptop webcam or mobile phone camera, the researcher digitally captured the participants facial image into the CMF application. Participants were advised audio-recording was beginning, and readiness to proceed was confirmed. Participants were then encouraged to share their thoughts, reactions, and observations, as moderate consumption appearance effects were simulated.

*Laptop Procedure:* The researcher explained the layout and operation of the software; principally, that the initial facial image to the left of the screen simulated age at thirty-five years without alcohol, and the simulated image to the right was the same age, plus moderate consumption. The researcher then clicked on each age increment (35, 45, 55, 65, and 72 years), pausing between each, to enable participants to make disclosures, and pursue interesting data. Next, the researcher introduced the high consumption simulation, explaining this was consumption beyond the current recommendations (NHS, 2018), before again advancing through the age increments.

*Mobile Phone App Procedure:* The researcher explained the layout and operation of the software; principally, that the initial facial image to the left of the screen simulated age ten years into the future without alcohol, and the simulated image to the right was the same age, plus moderate consumption. The researcher then clicked on each age increment (ten

years and 20 years in the future), pausing between each, to enable participants to make disclosures, and pursue interesting data. Next, the researcher introduced the high consumption simulation, explaining this was consumption beyond the current recommendations (NHS, 2018), before again advancing through the age increments.

With both the laptop and mobile procedure, the participants were then encouraged to operate the software on the devices, to aid familiarisation, and answering of the remaining questions. Upon session completion, audio-recording was stopped, and participants debriefed and thanked for participation. Subsequently, recorded data were anonymised, transcribed, and pooled for analysis.

### **Data Analysis Method**

Recorded data from each individual session were transcribed verbatim, pooled, and subjected to inductive thematic analysis (ITA), according to Braun and Clarke's (2022) six phases; namely familiarising ourselves with the dataset; coding; generating initial themes; developing and reviewing themes; refining, defining and naming themes; and writing up. . ITA is a method designed to identify themes, within characteristically rich qualitative data (Braun and Clarke, 2022), to enable interpretation of facets of the larger research question (Boyatzis, 1998). As ITA is data-driven, rather than theoretically-driven (Braun and Clarke, 2022), selection of this inductive, rather than deductive analysis method, was considered appropriate, due to the personalised nature of the current study. This approach means data and identified themes remain directly connected (Patton, 1990), irrespective of the study's questions, or theoretical focus (Braun and Clarke, 2022). An inductive thematic analysis approach has been used in previous studies using both Change My Face software (Owen et al., 2019) as well as other

piece of research using appearance focussed software (e.g. Williams et al., 2013). A critical realist epistemological position underpinned the research. Braun and Clarke (2022) report that critical realism is the process of combining ontological realism (the truth) with epistemological relativism (maintaining that it is impossible to access the truth directly).

## **Results**

Participants articulated a rich range of insights into their experiences, thoughts and feelings, whilst immersed in the intervention. Analysis of pooled data captured these experiences and reactions in four primary, discreet, yet interrelated themes, each being directly salient to interpretation of facets, and overall satisfaction, of the research question, namely:

1. Alcohol as a threat to appearance
2. Motivations to protect appearance
3. Motivational aspects of the intervention
4. Proposed improvements and applications

Each theme is expanded on below, with illustrative participant quotes and pseudonyms.

### **Alcohol as a Threat to Appearance**

The key aim of the current appearance-based intervention is to elicit positive behavioural change, by acute demonstration of the potential negative effects on appearance from both safe and risky alcohol consumption behaviours. Interestingly, participants expressed no negative reactions or observations towards intrinsic ageing alone, as all negative comments were firmly directed at the universally disfavoured comparison between aged, and aged-with-

alcohol images, notably for both moderate and high consumption. In support of effectiveness and satisfaction of this key aim, participants initially expressed a range of short, acute, aversive emotional reactions, at the severity of the simulated potential impact of alcohol on their appearance, in comparison to merely intrinsic ageing. For instance, Joe used the term “half dead” to describe how he looked in the alcohol aged image, focusing on the relative unhealthiness of the alcohol aged image compared with the image showing intrinsic ageing:

“I look half dead in that one [alcohol aged image]!” (Joe, Laptop).

Participants reacted emotionally to the images, and subsequently described these emotions variously as ‘foreboding’, ‘fearful’, ‘surprised’, ‘shocked’, ‘horrendous’ and ‘disgusted’. Awareness of the significance of appearance as an indicator of general health and condition was also present, and on reflection, communicated to be the main cognitive reasoning behind these initial acute emotional reactions:

“Well, well I would say, erm, a fear of consuming alcohol. Erm, because of, the, I, I, could see even without having a proper look, the damage that it does to your health is very evident I would say. So, yeah, fearful of alcohol consumption” (Joe, Laptop).

“It one hundred percent makes you think about, you know, what you’re taking and what in excess it’s actually doing to your body. Not just on the inside but obviously on the outside as well from looking at those photos” (Greg, Mobile).

Some of the participants reported having some previous expectations of how the intervention might make them look, but reported being shocked at the impact of alcohol on their extrinsic ageing. This shock reaction is shown clearly in this quote from Nick:

“I expected obviously the photo to show some sort of ageing, like obviously naturally. But the effects of the alcohol and everything, that was, that was a bit of a shock. You know, that was kind of like, I didn’t expect it to impact it that much” (Nick, Mobile).

Each of the participants found one particular aspect of alcohol ageing damage to be the most personally impactful, and emblematic of alcohol’s harmful effects. These aspects, by implication, also represent the primary image-based stimuli for their aversive reactions, and were experienced negatively by participants:

“That bloatedness, puffy in the face, pores, lines. It just ages you. That looks awful” (Greg, Mobile).

“It's given me visible forehead lines. Way more wrinkles around my eyes. My eyes are smaller. My eyelids are droopier. I've got chubby cheeks” (Seb, Mobile).

However, even at lower ages with therefore much less cumulative damage, the effects of moderate (safe), and not just high (unsafe) alcohol consumption were both regarded as highly undesirable, concerning, and clearly distinct to intrinsic ageing alone:

“Well, I can definitely see even at aged 35 is that? That there's er, quite a big difference between moderate, well, between alcohol and no alcohol” (Joe, Laptop).

“You just see how consumption of you know things does have a great negative effect especially the amounts - even if it’s a small amount it still had some effect” (Ben, Mobile).

Accordingly, all the above data indicates the intervention was effective in demonstrating the negative appearance effects of alcohol, as participants clearly now perceived alcohol to be a manifest threat to both appearance and health, and had negative emotional reactions to the

alcohol aged image. The consequences of this evidently rapid re-assessment, threat realisation, and resultant aversion, upon the participants' alcohol attitudes and future consumption plans, form the basis of theme two.

### **Motivation to Protect Appearance**

Participants' acute realisation of alcohol as both a proximal and distal threat to appearance and health, was evidently thought provoking, and triggered reappraisal of their current consumption attitudes, and perceptions of the worth of alcohol, and participants spoke about wanting to change their drinking behaviour after seeing the alcohol aged image:

“Yeah. I do drink from time to time, at times of like, where I am at, in terms of social aspects, but it does kind of put you off drinking, and how much you drink. So it kind of made me think of alcohol differently now” (Axel, Laptop).

“For me, personally, looking at that for me would be enough to go, ‘Bloody hell, I need to change something there’” (Greg, Mobile).

Furthermore, regardless of their prior alcohol attitudes and consumption behaviours, all participants indicated the adverse effects were much worse than expected, which logically therefore, also further explains their strongly aversive reactions to the images:

“I mean, I knew the effects of alcohol were bad, erm, but this just shows just how bad they can be. So it's, it's worse than I expected” (Joe, Laptop).

Notably, in indication of self-efficacy, all participants considered their alcohol consumption behaviours, and the resultant effects, to be completely their personal responsibility, and under their control:

“I guess a part of me was almost expecting that you're not always going to look great no matter what you consume. But, knowing that I, I don't, that I don't consume that much anyway that I, I know 100% I'm definitely going to stay away from that level of consumption anyway. Solidified it” (Andrei, Mobile).

Jake talked about personal responsibility in terms of how he was in control of whether he would be impacted by the ageing effects of alcohol in the future, saying it is “all down to me”, emphasising how he felt it was his responsibility alone:

“Yeah, I mean it's, it's all down to me if that happened or didn't happen” (Jake, Laptop).

This acceptance of personal responsibility - plus reappraisal and risk assessment, and the apparent attitudinal change - importantly also converted into expressed motivations and intentions to adopt healthier consumption behaviours, or, provided reinforcement to maintain already low intake:

“I feel that the intervention has just reinforced that, and furthered that, negative feeling around alcohol because it shows that actually, the external effects of alcohol are worse than what I had anticipated” (Joe, Laptop).

For some participants, on further reflection, even the much lesser potential negative appearance and health effects of moderate consumption, were too severe, and so motivations to cease consumption entirely, were elicited and disclosed. For instance, Axel and Greg report that they may now decide to stop drinking alcohol altogether; potentially life-changing responses to the intervention:

“Looking at the effects of this, through the intervention, it does kind of, like, makes me want to like stop drinking. I don't really drink a lot, I would say like a few every month or so. But this made me probably want to stop like, as a whole” (Axel, Laptop).

“Obviously looking at it and looking at the scale of what its going to be in, you know, ten plus years, twenty plus years it's quite a, it's quite clear on what the best course of action is to take [cease drinking alcohol]” (Greg, Mobile).

These stated motivations to protect personal appearance, and health, against the risk of harm, illustrate the importance and concerns of appearance to all the participants, and suggest that appearance-related risks may influence these men's future drinking behaviour.

#### **Motivational Aspects of the Intervention.**

The majority of participants communicated the intervention to be generally effective, as an image-based means to demonstrate the potential threat of appearance damage from alcohol, to thereby trigger reappraisal of their attitudes, and elicit motivations towards adoption or maintenance of healthier consumption behaviours. Participants used phrases such as “it's served its goal” and “a good eye-opener”, stressing effectiveness in promoting behaviour change:

“I just, I feel like, as an intervention it's served its goal, and it does what I need it to” (Adrian, Laptop).

“It's definitely a good eye-opener. It makes you think like, I don't want to end up like that. Let's not do that” (Nick, Mobile).



There were two participants who did not find the intervention to be effective. David felt that he was going to look bad in old age either way:

“No, it hasn't [impacted my intentions to drink alcohol]. No Because I'm going to look like crap anyway, so (laughing) might as well be chubby and crap haven't I” (David, Mobile).

The other participant reported that he felt that he looked better with alcohol, due to the increase in weight in his appearance:

“It didn't really help me did it, because I look better with alcohol. So it didn't help in my case” (Dale, Mobile).

However, despite feeling he looked better with the added weight gain from alcohol, Dale was still positive about the effectiveness of the intervention overall in promoting behaviour change:

“In my case, it wasn't really negative [the way he looked with alcohol ageing] so I mean, that didn't really work in my case. But I think that it's a really good way of preventing people from drinking alcohol” (Dale, Mobile).

In addition, even when participants correctly acknowledged that generalised imagery software simulations cannot always be 100% accurate for everyone, they still considered the intervention to be effective:

“Hmm, certainly within the limits it's able to do, it seems to be very effective and efficient. However, I can tell it can't quite make an accurate, representation, 'cause obviously we all age differently” (Timothy, Laptop).

A range of specific features of the intervention were considered the main reasons for this expressed verdict of effectiveness. The shock value of the simulated imagery effects, articulated as experienced by all the participants, was one such aspect. For instance, Adrian compares to other, less effective (“lacklustre”) interventions:

“I mean it works quite well as an intervention because it's quite shocking, I mean some interventions are quite lacklustre, but this has a nice effect I think, 'cause I'm quite now scared for myself” (Adrian, Laptop).

Congruently, these participants considered the intervention’s focus upon showing facial appearance damage via imagery, to be specifically effective, as opposed to the more typical approach, of providing verbal or text based educative health information, regarding potential visceral damage:

“Usually like alcohol, like when you talk about the effects of alcohol, it talks about the liver, the kidney damages, usually. I don’t really hear anything about your facial appearance or such, which kind of, you as you've shown me here, it changed my mind a little bit now” (Axel, Laptop).

More specifically, the avoidance of generic facial imagery usage, in preference to personalisation, via use of participants’ own facial images, was also expressed to be a particular reason for the intervention’s effectiveness:

“Well I think with some of the interventions, they aim for a personal touch, but what's effective is you've actually used the participant's image. Which I quite like actually so, it really feels like it's me. Rather than just taking someone's word for it...when you put

yourself in it it's just more, you can really just understand the information I think" (Adrian, Laptop).

Additionally, the capability afforded by the intervention, to clearly differentiate between the effects of intrinsic ageing, versus ageing plus moderate or high alcohol consumption, at different age increments, was considered a strength. Participants explained they liked that this afforded progressive simulation of alcohol appearance effects, which therefore could be compared, but not erroneously dismissed as, or confused with, normal intrinsic ageing:

"I suppose the most effective aspect would be the comparison between, normally aged without any alcohol consumption compared to being aged, taking into account alcohol consumption, and then also the distinction between moderate consumption and high consumption and the difference that that causes. Yeah, because it enables you to see erm, that, that there is actually a difference and that, if you do consume alcohol, you will age quicker" (Joe, Laptop).

Furthermore, all participants endorsed the simplicity of the intervention's interface ("simple", "easy to use"), which they explained increased effectiveness, and ease of use, by providing clarity via an absence of competing stimuli, such as text:

"Easy to use, it's simple, which is obviously needed. It is, a very good thing, it needed it, definitely. You don't want to be too, too technical with things. Because not everyone is very advanced in terms of like, using technology and such" (Axel, Laptop).

"Its actual layout is very simple and easy to use" (Timothy, Laptop).

As well as gaining general and specific insights into aspects of the intervention's effectiveness, the current study was also interested to explore how participants thought it could be improved, these ideas are explored in theme four.

### **Proposed Improvements and Applications**

The participants proposed numerous potential improvements and future applications for the intervention. This participant noticed a limitation regarding the absence of simulated ageing effects on hair, inclusion of which he thought would increase realism and credibility, and thereby make the intervention more effective:

“Potentially the consideration of, like, the hair loss, or, colour, being lost. Because even in like an image like that, it's still, my hair colour is still retained. And at the age of 72, that's unlikely. Even taking into consideration, like, if it was asked of people whether, hair loss is er, heritable in their family or whatever, like what could be a potential, realistic option for them in later life. Because you can have more realistic simulation” (Timothy, Laptop).

Other participants thought the inclusion of generic imagery, depicting comparative potential visceral damage (such as liver damage), alongside the facial imagery for the given age and consumption level, could add a further layer of graphical information and extra consumption deterrence:

“Erm, erm, showing what it would look like on the inside. In terms of yeah, insides, instead of the outside. So damages what within, so like liver damages. I don't know how that would work though. Damaged organs would be one of them as well. It would put off a lot of people” (Axel, Laptop).

Longitudinal application of the intervention was also advocated, where participants would repeat the intervention in the future, using stored simulated imagery from the original intervention as a baseline. Their actual appearance would then be compared to their potential appearance, acting as feedback, to demonstrate any avoidable appearance damage they had sustained by alcohol consumption, to reinforce, or elicit healthier consumption behaviours. Joe talked about this idea, and how he felt that viewing this could have a 'powerful' effect on people:

“Yeah, because you'd have physical evidence then of what they used to look like, say 5 years ago and what they look like today. And then you could say, what we'll do here is we'll take the image of you today, show you an estimation of what you would have looked like, and show you would've looked like if you hadn't consumed this amount of alcohol, I think that's quite, that'd have quite a powerful effect I would say” (Joe, Laptop).

Participants also had some suggestions as to where the intervention could be administered, for example:

“When people have their passport photos done they could give you this option. Because the next time you renew your passport this is what you'll look like if your lifestyle isn't good” (Ivan, Mobile).

These suggestions constitute valued feedback and were gathered to inform potential future directions which are discussed below.

## **Discussion**

The current study sought to capture and understand the exclusively male participants' experiences of the intervention, and the effects upon them, plus insights signalling whether

appearance concerns are as influential a factor in men's alcohol consumption attitudes and intentions, as they are in women's (Owen et al., 2019). An additional aim was solicitation of participants' suggestions to improve the intervention. This resulted in four distinct, interrelated, overarching themes, which each enabled interpretation of facets, and collective overall satisfaction, of the research question. Namely: what are young male university students' experiences of a personalised, appearance-based, facial morphing, safer drinking intervention? In summary, it is reasonable to state these aims have been comprehensively met, and the research question fully answered. Furthermore, the results clearly demonstrate the majority of the participants perceived the intervention as effective, largely due to the novel, personalised, facial-morphing appearance-based approach utilised. These findings therefore support those of the preceding women-only study (Owen et al., 2019); plus, the appearance-based approach (Persson et al., 2017), particularly when personalised and when incorporating facial-morphing ageing effects (e.g. e.g. Flett et al., 2013, Williams et al., 2013). Support may also be inferred for other studies, which found people may be influenced to revise unhealthy behaviours if they perceive a threat to their appearance, and therefore this may represent a more persuasive approach for some people than factual health risk education (e.g. Owen et al., 2016). The significance of these findings is discussed in greater detail below.

The data gathered during immersion in the intervention highlighted participants' universally acute and shocked initial visceral responses, to exposure to the simulated imagery. These responses were primarily reactionary, affective, and spontaneous in nature, and voiced as shocked exclamations in response to exposure. Plus, the undesirable realisation that alcohol consumption behaviours, be they moderate or high, accelerate ageing, and therefore represent a manifest proximal and distal threat to personal appearance, and by implication,

health. Viewed through the lens of health psychology theory, these reactions most closely align with, and support, the threat assessment and perception aspect, of the health belief model (Rosenstock, 1990). Specifically, in this case, rapid and unwelcome realisation of personal susceptibility, to the threat of appearance damage, and the health damage of which it is the outward expression, due to alcohol consumption, plus the equally fast and unpleasant co-perception of the threat's potential severity. In indication of further threat assessment and perception, these initial reactions were subsequently followed by reflective, cognitive explanation and labelling of the experienced emotions (e.g. shock, fearfulness, disgust); participants disclosed that perception of this threat to health and wellbeing, was the primary cognitive reason for these negative reactions.

Importantly for accurate, inductive data interpretation, all negative reactions were purely in response to the differences observed between simulated natural ageing, versus aged-with-alcohol, and not towards natural ageing alone. These disclosures are indicative of attitudes inconsistent with findings suggestive that younger people take a stereotypically negative view of ageing, and older people (e.g. Richeson and Shelton, 2006). Some participants regarded even the much less severe appearance effects of moderate consumption, to be unacceptable. These outcomes are noteworthy and positive, bearing in mind findings that even consumption levels regarded as moderate and non-risky, still elevate the chances of disease or health condition development (WHO, 2023). Also importantly, these disclosures further support the effectiveness both of the appearance-based approach, and this intervention, to demonstrate the potential personal appearance consequences of alcohol consumption, and manifest susceptibility, to a male target audience, of a particularly high-risk group.

Encouragingly, the data clearly illustrate participants' reactions to their acceptance of these new perceptions, of personal susceptibility to alcohol as a threat to their appearance and health, and their realisation that the impact of this threat is unacceptably severe. These data support the aims of the intervention, and the central premise of the appearance-based approach, which posits demonstration of an appearance threat, may elicit positive behavioural change (Owen et al., 2016). All participants articulated that the intervention had either reinforced their intentions to maintain an already safe level of consumption, or, had elicited behavioural motivations and intent, to reduce their consumption to healthier levels. Some participants went much further and expressed intentions to cease consumption entirely. These expressed motivational findings are further supportive of, and consistent with, the HBM (Rosenstock, 1990). Specifically, progression to the theorised health motivation aspect, which follows threat perception and evaluation, and results in motivation to change the given health behaviour, in light of anticipated resultant benefits (Rosenstock, 1990). In this case, reducing or ceasing consumption, with the benefits of protecting health and facial appearance.

However, the opportunity for perceived barriers (Rosenstock, 1990) to arise beyond the intervention, which may potentially nullify these positive intentions, were they considered more powerful than the benefits, must be acknowledged. For young males, many powerful pro-alcohol, psycho-social influences exist, most of which are reinforced by pervasive alcohol advertising (Aiken, 2018), and may potentially later serve to function as such barriers. These include: beliefs that alcohol is essential to having a good time socially (Plasschaert et al., 2001), or, more problematically: unavoidable conformal social pressure to consume alcohol (Akvardar et al., 2004), or consumption to ameliorate negative mood states such as anxiety,



stress, or tension (Plasschaert et al., 2001). Accordingly, measurement of these possibilities, and the temporal stability of the intervention's effects in the longer term, could be served by quantitative longitudinal follow up of participants (see future directions).

The majority of participants endorsed the intervention as effective in making them reconsider their alcohol consumption beliefs and elicit motivations towards adoption or maintenance of healthier consumption behaviours. A key reason for this was use of imagery to demonstrate potential harm, instead of the conventional approach of verbal or textual health-based information. These findings support those of earlier appearance-based studies incorporating imagery, successfully applied to other health issues such as excessive UV exposure (Mahler, 2018; Rodgers et al., 2016) and smoking (Danaei et al., 2010). Furthermore, participants felt the use of facial morphing upon their own facial images, meant the intervention was deeply personal, as opposed to generic in nature. Therefore, the intervention resonated much more strongly, and memorably, by graphically demonstrating their personal potential susceptibility to adverse alcohol appearance and health effects. Whilst further evidencing the intervention's effectiveness, these findings also support the efficacy of earlier personalised facial morphing studies (e.g. Blashill et al., 2018). The intervention's simplicity and ease of use was also noted, and considered a strength, which was attributed to the absence of distracting extraneous text or health-risk information.

Lastly, participants usefully suggested improvements to the intervention, such as simulation of hair ageing, the current lack of which represents a limitation in accuracy. Also suggested, was addition of visceral imagery, to show accompanying internal alcohol damage. Alternatively, longitudinal application was proposed, to compare simulated and actual

participant ageing at future age increments, to provide feedback to elicit or reinforce healthier consumption behaviours. All suggestions represent valued feedback and have been considered with other potential options (see future directions).

### **Methodological Limitations**

Due to the discussed decades of didactic alcohol interventions (e.g. Thom, 2016), it is reasonable to assume participants were aware that health authorities view risky consumption behaviours negatively. Whilst these dangers are widely ignored by this high-risk group (Davoren et al., 2016), the possibility of social desirability affecting the sincerity of disclosed data must be acknowledged. This represents a risk, as despite successfully eliciting intentions to change behaviour, without longitudinal follow up, their endurance beyond the intervention is unknown. This is addressed below.

### **Future Research Directions**

As experiences and feasibility of the intervention have been explored appropriately using qualitative methodology (Patton, 1990), quantitative longitudinal follow up could usefully enable efficient measurement of the temporal stability of the intervention's effects, and the extent to which expressed motivations converted to healthier consumption (Clark-Carter, 2010). Furthermore, a larger scale, mixed-gender quantitative study, could evaluate the intervention's effectiveness, and also afford comparison to a conventional factual health risk intervention condition (Clark-Carter, 2010).

### **Future Practical Applications**

The current study used a combination of both laptop intervention and mobile phone app interventions, with the findings indicating both forms of the intervention to be effective, with

accordingly promising implications for future practice. This could include combination with mass-media and school-based population-level interventions, to cost-effectively reach large populations. The mobile phone app approach may be appealing to many social groups, due to the anonymity, convenience, ease of use, and portability afforded by these apps and devices (Radovic et al., 2016). Potentially, this combined approach may address the discussed weaknesses of population-level alcohol interventions (e.g. Chisholm et al., 2006), by contributing demonstration of personal susceptibility to the threats posed to appearance by alcohol. Bearing in mind the popularity of the recreational facial morphing app Snapchat (Jeong and Lee, 2017), this application could exhibit particular resonance, attraction and exposure, and thereby influence positive behaviours earlier in life, with resultant reduction in proximal and distal negative outcomes. However, the intervention's impact could be lessened when experienced in an informal setting. Nevertheless, this risk could be offset by the distinct advantages afforded by unlimited access, regardless of location and time (Radovic et al., 2016), principally the on-demand ability to re-experience the intervention, and view the simulated images, as many times as desired.

## **Conclusion**

The current study is the second to apply facial morphing software to alcohol, and the first focussed on a male sample. When the current findings are viewed alongside Owen et al. (2019) it is concluded that both the employed personalised facial morphing appearance-approach, and the current intervention, are effective in eliciting expressed motivations and intentions towards healthier consumption, or maintenance of already non-risky consumption, in both genders. These findings have promising implications for future practice, by development of a

potentially appealing app-based version of the software, and inclusion within economic, large-scale population-level interventions, to help address their weaknesses. However, longitudinal follow up is required to determine the endurance of these effects and conversion to healthier consumption behaviours.

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The Authors declare that there is no conflict of interest.

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### **Data Availability Statement**

The data generated during and/or analysed during the current study are not publicly available due to participants not giving permission for their transcripts to be publicly available, but are available from the corresponding author on reasonable request. Ethics approval, participant permissions, and all other relevant approvals were granted for this data sharing.

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