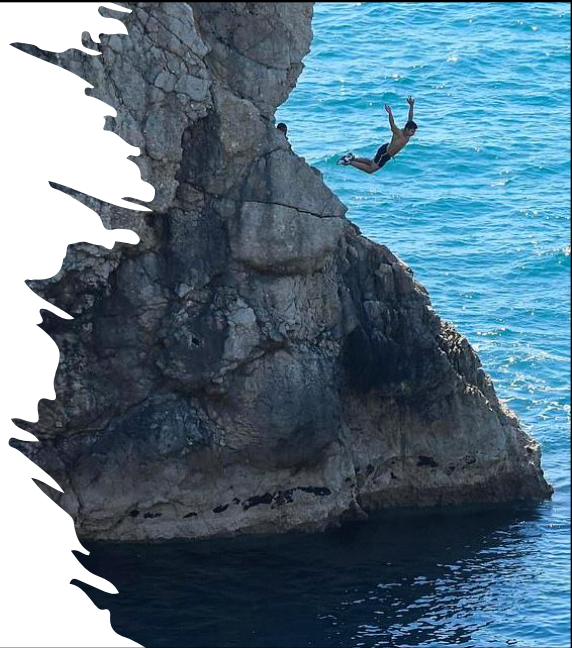


Fear, guilt, hope or humour? Emotional responses to water safety advertising in young adult men

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The back story

- Drowning in the UK presents a pressing public health issue, exceeding annual fatalities from home fires and cycling accidents. Despite awareness efforts, approximately 400 deaths occur annually, accompanied by numerous life-altering injuries (WAID, 2019)
- Globally, males face an 80% higher drowning risk, especially middle-aged men and teenage boys, attributed to risky behaviours and societal factors (WHO, 2014)
- The Royal National Lifeboat Institute (RNLI) acts as an important service for water safety communication and education. They currently use a prominent and universally accepted key message of "Float to Live" executed through emotional storytelling to highlight risks, emphasize the dangers and to educate the floating position.



As highlighted by the NWSF, drowning incidents in the UK surpass the annual toll of accidental deaths from home fires or cycling accidents on roads (WAID, 2019). Statistics reveal an average of 400 accidental drowning deaths annually across coastal and inland water bodies in the UK, alongside numerous near-fatal incidents resulting in profound and lasting consequences, such as brain injuries induced by oxygen deprivation and post-traumatic stress disorder (PTSD). Furthermore, data from the HM Coastguard database indicates that over 200 individuals succumb to incidents classified as 'accident suspected' or 'inconclusive' in and around UK coastal areas each year. The economic ramifications of such fatalities are substantial, with an estimated cost of £215,000 per fatality, inclusive of search and rescue expenditures. Moreover, maritime search and rescue operations entail significant costs, amounting to at least £28,000 per hour when employing helicopters, lifeboats, and coastguard rescue teams. These incidents also inflict enduring emotional and financial burdens, with each fatality estimated to negatively impact the well-being of 20 family members and acquaintances.

Globally, males are 80% more likely to drown than females, specifically middle-aged men and teenage boys (WHO, 2014). Men are in the water more often and exhibit riskier behaviour, such as swimming alone and at night, drinking alcohol

and not wearing lifejackets. Equally research suggests the increase in male drowning is due to social pressures and underestimating risk, so they contribute a substantially higher proportion of drowning fatalities compared to females, (Hills et al., 2021)

Literature



Research suggests the increase in male drowning is due to social pressures and underestimating risk, so they contribute a substantially higher proportion of drowning fatalities compared to females, (Hills et al., 2021).



Determining the single most effective advertisement in changing men's behaviour is challenging due to the multifaceted nature of advertising impact and the diverse array of factors influencing behavioural change. However, numerous campaigns targeting men have demonstrated significant effectiveness in promoting positive behavioural outcomes, as evidenced by scholarly research in the field.



Emotions are a key component of affective advertising communications, and the types of reactions that advertising messages evoke and the processes that influence the outcomes of an advert are key concerns within advertising research (Poels and Dewitte, 2019).



We know that water safety messages currently are not measurably effective (Hills., et al., 2024) or further being accepted by men. Broadly research informs us that women do respond with more seriousness to higher levels of fear messaging as they tend to be more health conscious and prevention focussed, (Noble et al., 2014) but we do not understand or rather what is not clear is how men respond specifically to water safety advertising messages with high levels of emotional load.

Gendered Campaigns using emotion

- **"Real Men Don't Drink and Drive" Campaigns:** Anti-drink driving campaigns have been widely acknowledged for their impact on reducing drink driving rates among men. For example, studies such as those by Shults et al. (2009) and Elder et al. (2004) have demonstrated the effectiveness of emotionally charged and graphic anti-drink driving advertisements in altering attitudes and behaviors related to alcohol-impaired driving.
- **"Man Up" Mental Health Campaigns:** Initiatives aimed at promoting men's mental health, such as the "Man Up" campaign in Australia, have garnered attention for their efforts to challenge traditional masculine norms and encourage help-seeking behaviors. Research by Seidler et al. (2016) highlights the importance of such campaigns in addressing stigma and increasing awareness of mental health issues among men.
- **"Be a Man" Gender-Based Violence Prevention Campaigns:** Campaigns addressing gender-based violence and promoting healthy masculinity, such as the "Be a Man" initiative in Bosnia and Herzegovina, have been lauded for their role in challenging harmful gender stereotypes and promoting respect and consent. Academic research, including studies by Flood and Pease (2009) and Casey et al. (2013), underscores the importance of such campaigns in fostering attitudes and behaviours conducive to gender equality and violence prevention.

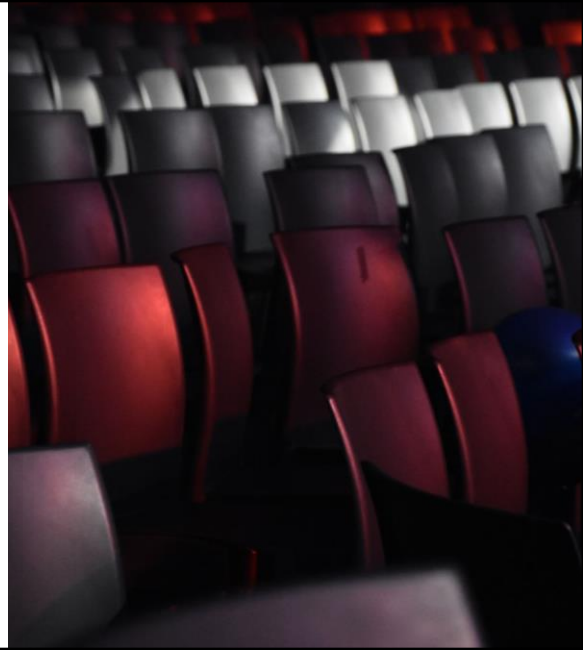
When looking towards other gendered campaigns that have been effective in their objectives to change behaviour these have been difficult. Determining the single most effective advertisement in changing men's behaviour is challenging due to the multifaceted nature of advertising impact and the diverse array of factors influencing behavioural change. However, numerous campaigns targeting men have demonstrated significant effectiveness in promoting positive behavioural outcomes, as evidenced by scholarly research in the field.

While each of these campaigns has demonstrated

effectiveness in specific contexts, the scholarly literature emphasizes the need for ongoing evaluation and refinement of advertising strategies to maximize their impact on behaviour change among men. Moreover, the effectiveness of advertising interventions is often contingent upon broader societal changes, policy interventions, and individual factors, underscoring the complexity of influencing behavioural outcomes through advertising alone.

The role of appeals & emotions in advertising

- Advertising appeals play an important role as persuasive tactics to engage the audience and shape their decision-making (Jovanovic et al. 2016; Yousef et al. 2021).
- Appeals are instrumental in capturing the audience's attention as advertisers use them to create connections on cognitive and/or emotional level (Jovanovic et al. 2016; Yousef et al. 2021).
- Emotional appeals tap into the audience's emotions, resonating on a deeper, psychological level by evoking feelings such as fear, joy, love, e.t.c (Kim et al. 2020). This strategy creates an emotional connection that enhances the message's impact and persuasiveness (Casais and Pereira 2021).
- Scholars have noted different types of emotional appeal across different studies (Pollay 1983; Moriarty 1991). However, for the context of this study, emphasis will be placed on fear, guilt, hope and humour appeals as these are the emotions which are commonly used in water safety advertising design.
- The study considers emotions through valence and arousal – the valence being the emotion felt (negative or positive) and arousal being how intense or aroused



Theoretical perspective

- The theory that discusses "message acceptance, stimulating message impact, and an anticipated response" is the Elaboration Likelihood Model (ELM), a prominent theory in the field of persuasion and attitude change (Petty and Cacioppo).
- The ELM proposes two routes through which persuasive messages can lead to attitude change: the central route and the peripheral route.
- ELM also acknowledges the role of anticipated response, which refers to individuals' expectations about the consequences of attitude change.
- Anticipated response can influence the route of persuasion individuals choose to take, as well as the extent to which they engage with the persuasive message.
- Overall, the ELM provides a framework for this study in terms of understanding how individuals anticipate, process and respond to persuasive messages based on their level of involvement, motivation, and cognitive resources.
- By considering both central and peripheral routes to persuasion, advertisers and communicators can tailor their messages to effectively engage audiences and elicit desired responses, therefore these two routes are valuable to our research aims in terms of informing how we investigate our enquiry and our research design.

Research Aims



Record the self-ratings of different valence and arousals experienced by males aged 18-30 years while watching the water safety adverts

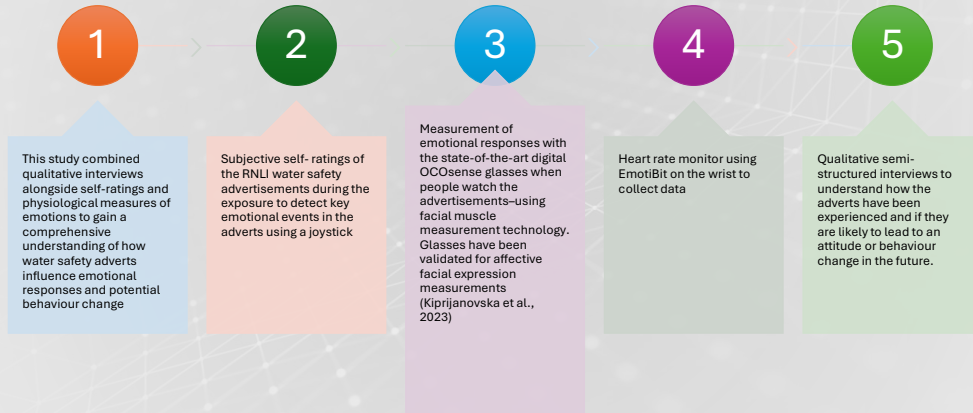


Record the different emotions (fear, guilt, humour, hope, empathy, anger, gratitude, disgust, sadness) and emotional states experienced by males aged 18-30 years during exposure to the adverts



Investigate which water safety adverts are self-determined as strong in terms of message acceptance, stimulating message impact and an anticipated response by males aged 18-30 years

Research design

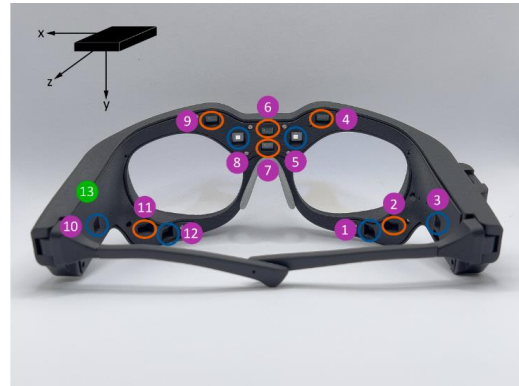


Sample & Screening

- Purposive sampling
- Sample comprised 13 male participants aged 18 to 30 years, with a mean age of 25.3 years (SD = 6.3).
- The inclusion criteria was carefully defined to ensure a suitable and homogeneous sample.
- Participants were required to be within the age range of 18 to 30 years, identify as male, and demonstrate moderate enjoyment of sea or freshwater activities, quantified as 3 to 20 visits annually to beaches, sea resorts, or other water-related environments. Additionally, participants were non-professional swimmers, had no significant fear of water, and had no prior involvement in traumatic water safety incidents, such as near-drowning experiences, encounters with rip currents, or participation in rescues.
- Participants were also required to occasionally engage in water activities such as kayaking, swimming, paddleboarding, or jet skiing.
- To maintain sample homogeneity, individuals with a history of psychiatric, psychological, neurological, cardiovascular, or respiratory conditions were excluded from participation. Furthermore, individuals taking medications that could influence mood or cognitive function, such as antidepressants, were also excluded from the study.
- The experiment consisted of one online questionnaire and one interview-based survey (a screening questionnaire and an end-of-study interview), as well as a laboratory-based task. Responses to the questionnaires were collected using Qualtrics software. The interview questions were specifically designed for this study.

OCOsense Glasses

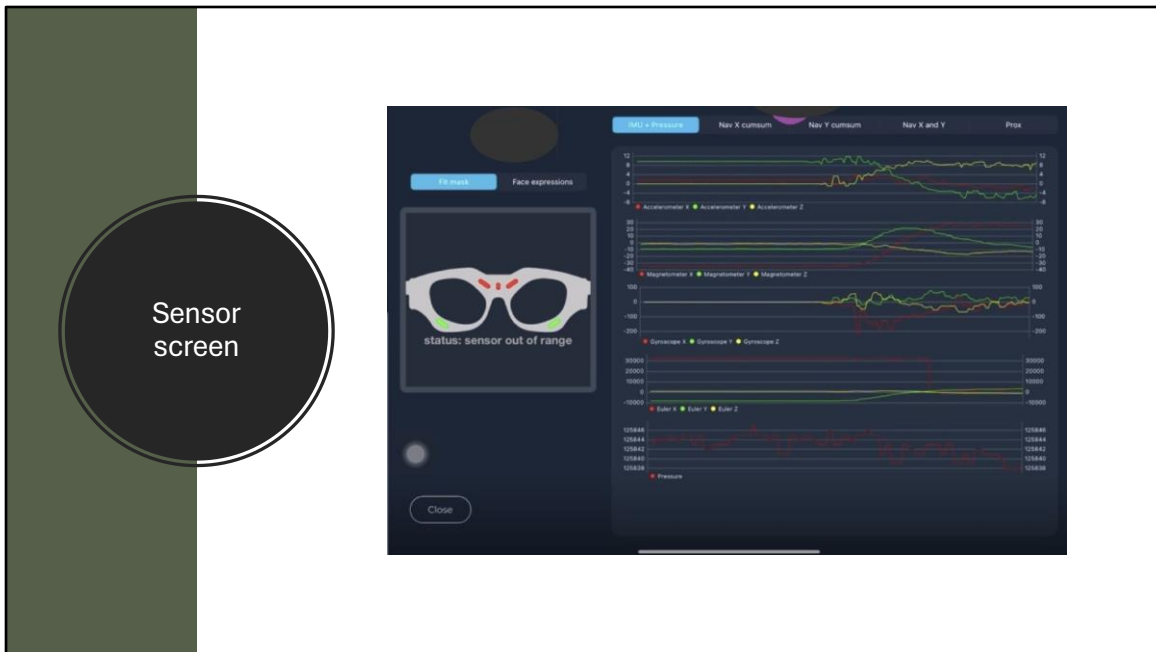
- The primary material used for this study was the OCO Sense glasses, a wearable device specifically engineered for real-time monitoring of physiological and emotional responses.
- The OCOsense glasses are equipped with a total of 13 sensors that are meticulously positioned to monitor facial muscle activity and physiological responses.
- The core component of these glasses is the OCOTM sensors, which utilize advanced Optomyography (OMG) technology. Unlike traditional EMG systems that require direct skin contact, OCOTM sensors operate effectively at distances ranging from 4 mm to 30 mm from the skin. This non-contact method enables the detection of minute muscle movements with high precision, capturing displacements as small as 4 μm (Archer et al., 2023).



These sensors are strategically placed to cover key facial muscles: two sensors on the frontalis muscles to monitor brow furrows and raises, two on the zygomaticus major muscles to capture smiling activity, and one on the procerus muscle for additional sensitivity in distinguishing between brow-raising and frowning expressions. Additionally, the glasses incorporate photoplethysmography (PPG) sensors to monitor heart rate and heart rate variability (HRV), providing valuable insights into emotional arousal and stress levels.

To enhance data collection, the glasses also feature a 9-

axis Inertial Measurement Unit (IMU) that records head movements, along with proximity sensors strategically placed on the cheeks, temples, and eyebrows. This comprehensive sensor array continuously records facial muscle movements, heart rate, and HRV, ensuring accurate and reliable measurements of emotional states and physiological responses during various activities.



The system features a Fit Mask view, which is essential for ensuring that the sensors are optimally positioned close to the skin. This view uses a color-coded feedback system: red indicates that the sensors are out of range, while green confirms that they are properly aligned. This visual indicator is crucial for maintaining accurate data collection, ensuring that the sensors are positioned correctly for effective facial movement detection.

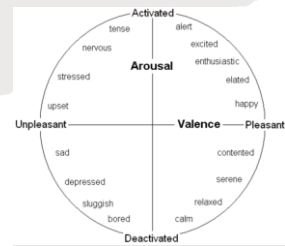
Once the sensors are properly aligned, the Facial Expression view facilitates the calibration process. This view allows users to verify the success of the calibration by displaying an avatar that mirrors the user's facial expressions in real-time. An accurate replication of expressions on the avatar confirms that the system is correctly calibrated and functioning as intended.

The system's graphical interface offers comprehensive real-time data visualization. On the right side of the display, it presents data from various sensors, including accelerometers, magnetometers, gyroscopes, and pressure sensors. These sensors track data along the X, Y, and Z axes, with corresponding graphs providing detailed insights into the device's movement, orientation, and interaction with the user's face. This level of visualization is vital for monitoring how the glasses respond to facial movements and pressure changes across

specific facial areas, ensuring the device's reliable performance during use.

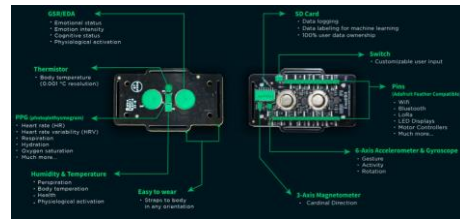
Joystick

- A joystick was used by participants to navigate the experiment and provide continuous subjective ratings for valence and arousal
- They rated an emoji displayed on the joystick by selecting the one that best matched their feelings. Participants used a radial scale ranging from 1 to 9 on both axes (with 5, 5 at the centre).
- The x-axis represented Valence (positivity or negativity of emotions: happy or sad), while the y-axis represented Arousal (strength of emotion: calm/relaxed or intense). Emojis depicted expected emotional responses for the minimum and maximum values on each axis.



EmotiBit

- The EmotiBit hardware is a versatile extension of the Arduino ecosystem, designed to provide researchers with customizable access to high-quality biometric data. This device includes a factory-calibrated circuit for measuring electrodermal activity (EDA), ensuring precision across various skin types. Cardiovascular metrics, including heart rate, are accurately captured using a Maxim (MAX30101) photoplethysmography (PPG) module.



Calibration of facial expression & participant set up



The study lasted about approximately 45 minutes, including calibration (HR, facial expression, movement), practice trials, and the experimental task. During the calibration phase, participants' baseline heart rate measurements and facial expressions were recorded. The calibration of facial expressions is illustrated

Upon arrival at the BU PGB cinema room, participants were given an information sheet and a consent form, which they reviewed and signed. The experiment was conducted in a controlled cinema environment designed to minimize distractions and create an immersive experience, closely simulating real-world conditions where such safety advertisements might be encountered (e.g., cinemas, and public service announcements).

- In practice trials, participants watched 2 emotional videos to learn how to use the controller for rating valence and arousal.

- The first video showed a panda being weighed by a zookeeper. This video was chosen to instill a positive valence with moderate arousal.

- The second video depicted small spiders being pulled out of cotton, selected to measure negative valence and moderate arousal.

- When participants selected the green dot with the joystick, the practice scene led them to the next scene.





- 11 RNLI water safety advertisements of varying emotional tones and lengths were chosen for this study and some were derived advert content in collaboration with other organisations such as National Water Safety Forum (NWSF)
- Advertisements ranged from lighthearted, such as the "Seaside Safety Song," to more dramatic and emotionally intense, such as "The Heart-breaking Story of Liam Hall."
- The purpose of this variation was to capture a wide range of emotional responses and understand which types of messages are most likely to evoke emotional engagement and potential behaviour or an attitude change.
- Each video included alterations between these conditions and a relaxation scene to manage participants' arousal levels and provide a baseline measurement.
- The total time of watching adverts was approx

Key	Advert title & link	Time	Advert purpose & appeal	Perceived emotions
A	Float to live https://www.youtube.com/watch?v=fgASxPh-xqU	1 minute	Informative, instructional	Fear
B	Little girl being rescued by RNLI https://www.youtube.com/watch?v=_f7srhWZDAk	0:56 seconds	Dramatic footage, warning of dangers	Fear, concern, worry
C	Evans story https://nli.org/safety/float/float-to-live-stories/evans-survived-a-rip-current	2:30 minutes	Survival story, warning of dangers	Hope
D	Seaside safety song https://www.youtube.com/watch?v=HmSM_Caw7vw	0:29 seconds	Informative	Humour, fun
E	RNLI: The heart-breaking story of Liam Hall https://www.youtube.com/watch?v=3Y5uUmW13fQ	2:48 minutes	Informative	Fear, guilt, sadness
F	Lad bible short film https://vimeo.com/241554265	1 minute	Informative, reverse storytelling	Fear
G	RNLI Christmas bed-time story https://www.youtube.com/watch?v=Z3u5Oh23JRo	2:07 minutes	Informative, storytelling	Bravery, admiration, heartwarming
H	RNLI the breath test https://www.youtube.com/watch?v=JgrUJCXqoYU	1:10 minutes	Informative and instructional	Fear
I	Respect the water via the NWSF 'make the right call' https://respectthewater.com/campaign/call-999/	30 seconds	Instructional and informative	Shock, worry, overwhelming
J	Alfie's phone https://www.facebook.com/watch/?v=334743484387815	2 minutes	Informative	Hope, bravery, uplifting,
K	Be a floater https://www.facebook.com/LADbible/videos/4873883065992178	0.54 seconds	Informative	Fun, humour, silly



Breath Test



Post-Exposure Semi-structured Interviews

- Interview questions included:
- "Which advertisement resonated with you the most and why?"
- "Did any of the advertisements evoke a strong emotional reaction? If so, which one?"
- "Do you think the advertisements would influence your behaviour around water?"



A post-exposure semi-structured interview was conducted with every participant to explore and investigate which adverts were determined to be strong in terms of message recall, message acceptance and impact.

The interview guide began with an introduction and a brief explanation of the study's purpose, followed by questions designed to gather background information on participants' media consumption habits and their exposure to different types of advertisements.

Participants were asked to recall and describe specific advertisements, including those from the RNLI, and to discuss their reactions, level of engagement, and the influence these ads had on their thoughts, feelings, and behaviours.

The interviews also delved into how participants processed the advertisements—whether through central or peripheral routes—according to the ELM, and sought their opinions on how advertising messages could be made more persuasive.

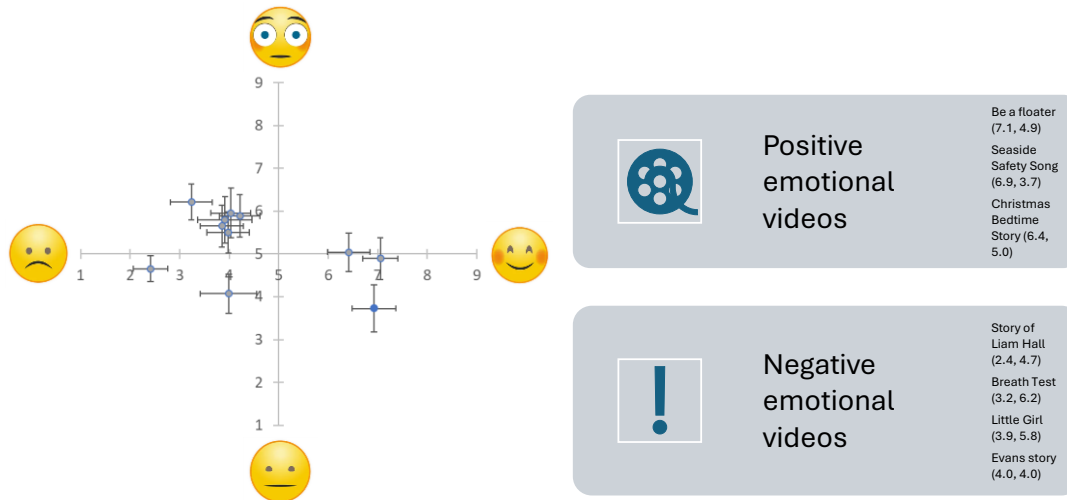
Analysis Approach

Quantitative data analysis involved correlating physiological responses, such as heart rate and muscle activity, with self-reported emotional ratings to identify patterns in participants' emotional engagement.

Interaction effects between advertisement type and emotional intensity were also explored to understand how different advertisements influenced emotional engagement.

In addition to the quantitative analysis, qualitative data from participant interviews were analyzed using NVivo software to identify recurring themes and subthemes related to emotional engagement, perceived effectiveness, and future behavioural intentions.

Quantitative Findings: Mean Valence and Arousal Ratings



I did not add the training videos

We have not done event based – these are MEAN average across entire video. It would be good to use event based so we can see moments within the videos that connected.

For the negative videos I wanted to point out that the combination of valence (neg – pos) and arousal matters potentially for remembering it.

Interestingly, the little girl in a dingy does not come out as different from the others. (We are still double checking the analysis)

The error bars are standard error values (horizontal – valence SE, vertical – arousal SE)

Be a floater strong positive valence not massively aroused – not bored and attentive

Seaside safety song positive but boring at 3.7

Story of Liam hall was most negative and medium arousal

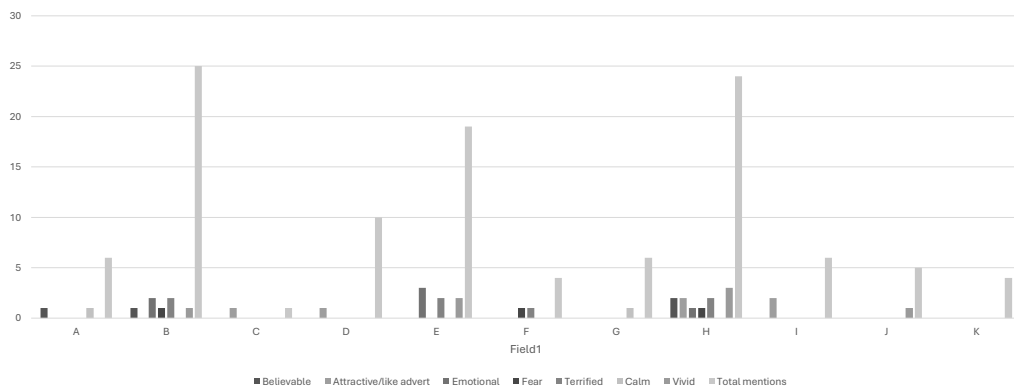
Breath test and little girl both most arousal and tense

Evans story was not as negative and not overally arousing



Float to Live with arousal and valence – when the character dips into water the valence drops (means feeling worry, anxious) arousal is high when the character breaths meaning the viewers are sympathizing with the character

Qualitative Findings



Adverts B & H being the most cited in terms of emotions and memorability across all the interviews. These were little girl being rescued and Breath Test.

The least was C – Evans story

Narrative Comments



"The most remembered and recalled – the little girl screaming and stress and panic –Liam's story felt real with the mum talking about son drowning – Breath test most engaging made you stop. I was less engaged with the cartoons and ladbible as there was not much substance with it. I preferred live footage more impact because of the shock factor".



"Visuals and emotions are important, but the important information needs to be there. It needs to be shocking."



"The guy who was falling into the water was weakest. I think you need something. Really scary and strong – like a kid drowning, it needs to be really shocking, or really vulnerable people in a state of panic i.e. an elderly person"



"I actually held my breath in the breath test so I was actively engaged in this."

Due to these narrative comments it would suggest the peripheral route was more often used because participants mentioned more often that source credibility was key (and using real live footage was vital to believiability), plus the enhanced mentions of emotional appeals. Although more data is needed to verify / validate this

Final thoughts

- These are only preliminary findings
 - More analysis is needed to combine the OCOsense data and heart rate
 - More participants are needed
 - Our plan is to re-run the experiment with 10 further male participants over the next month to improve validity and rigour
- Once we have conclusive findings we are de-briefing the research to RNLI and other water safety organisations
 - We would like to employ further applications of OCOsense glasses in different marketing contexts!

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