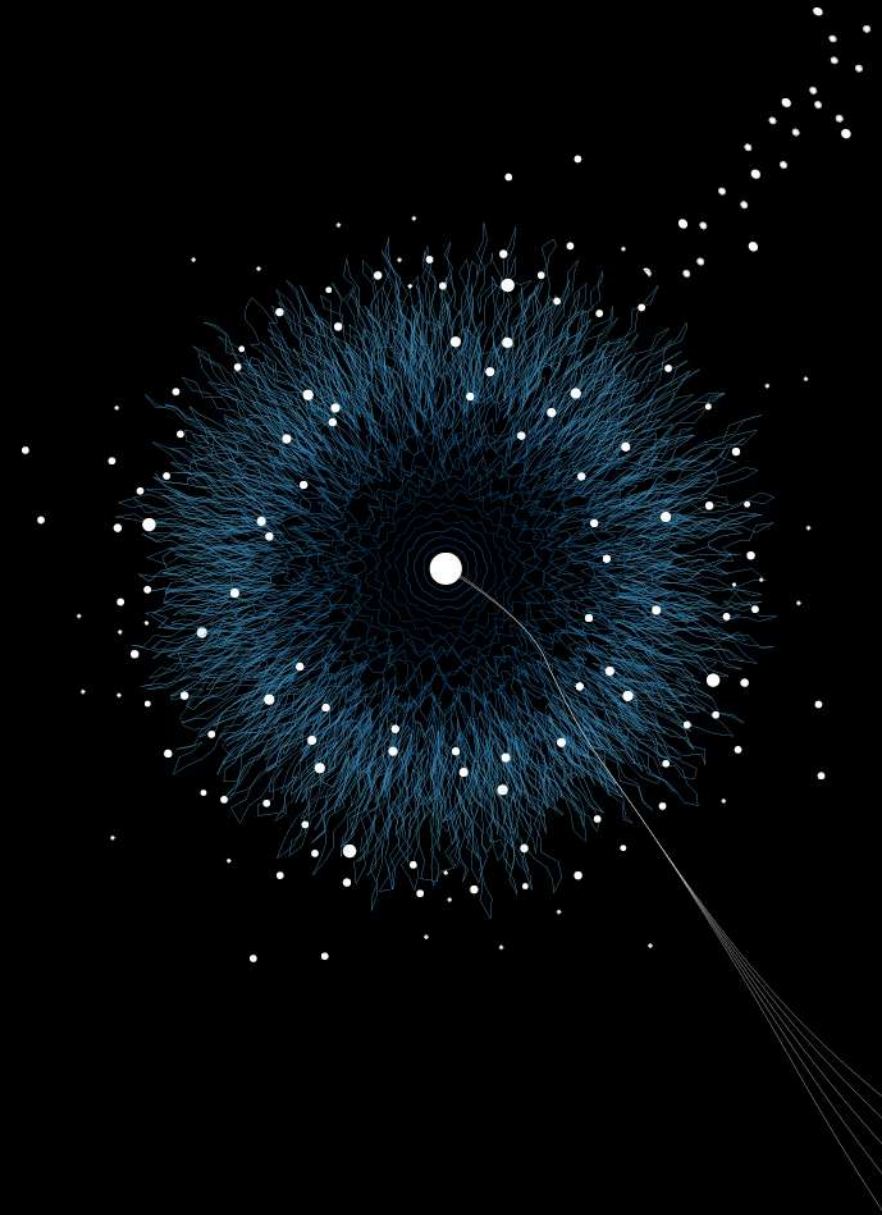


BMS Faculty

CHANGING HABITS ONE EXPERIENCE AT A TIME

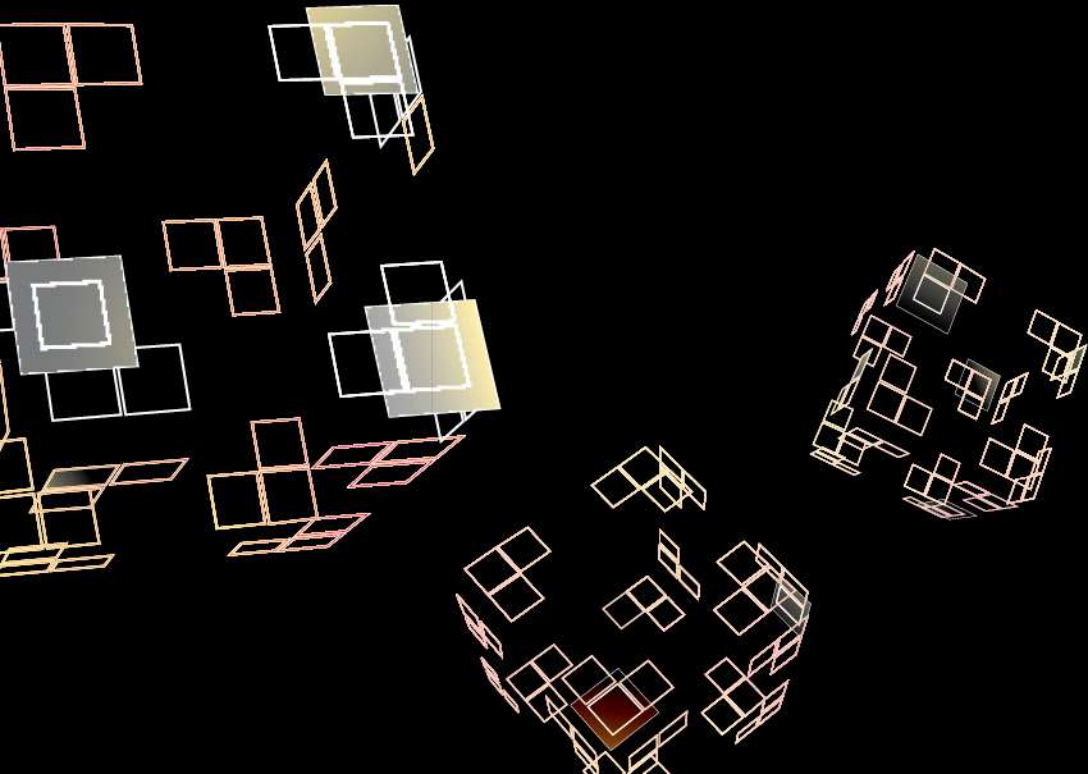
FUNDA YILDIRIM
CWI SOCIAL XR SPRING SCHOOL



UNIVERSITY
OF TWENTE.

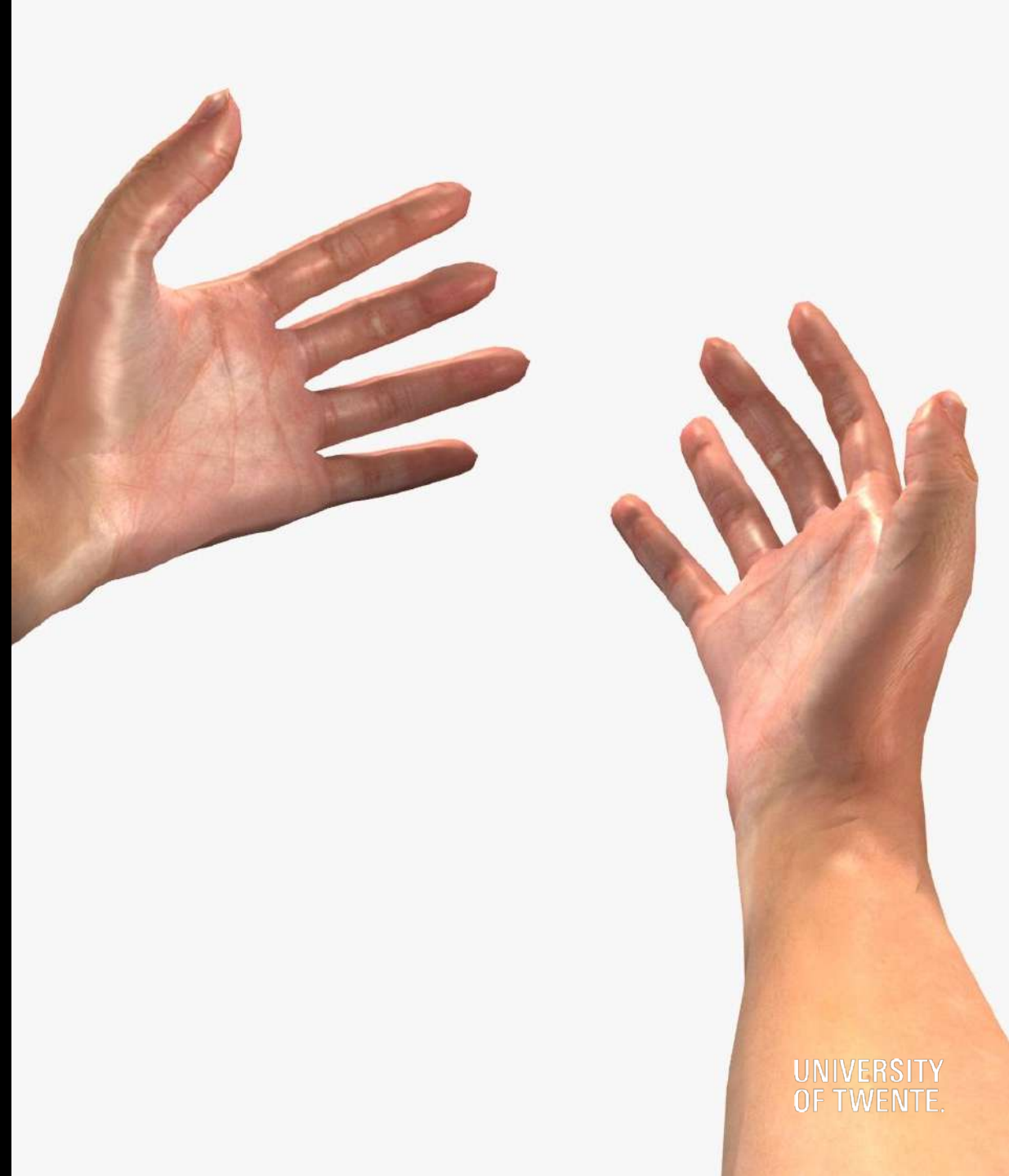
TABLE OF CONTENTS

- 01. VR in Psychology Research
- 02. Behavioral Change
- 03. Purchase Intentions and Sustainability
- 04. Climate Change Misinformation Correction
- 05. Pro-environmental Behavior
- 06. Attitudes towards Immigrants
- 07. Future Vision
- 08. **It's Your Turn to Decide**



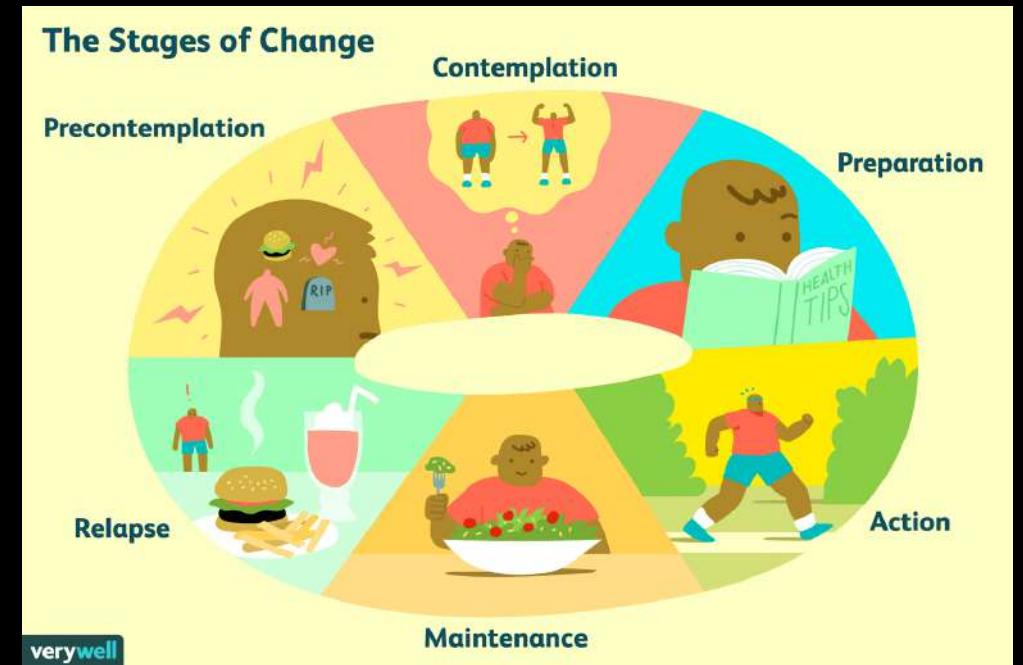
PSYCHOLOGICAL MECHANISMS IN VR

- Psychological biases need effort to overcome: critical thinking or exposure
- **Presence:** Feeling of being inside the virtual world (Slater & Sanchez-Vives, 2016)
- **Plausibility Illusion (Psi):** The brain treats VR events as if they are real (Slater, 2009)
- **Emotional Connection:** Heightens engagement and personal relevance



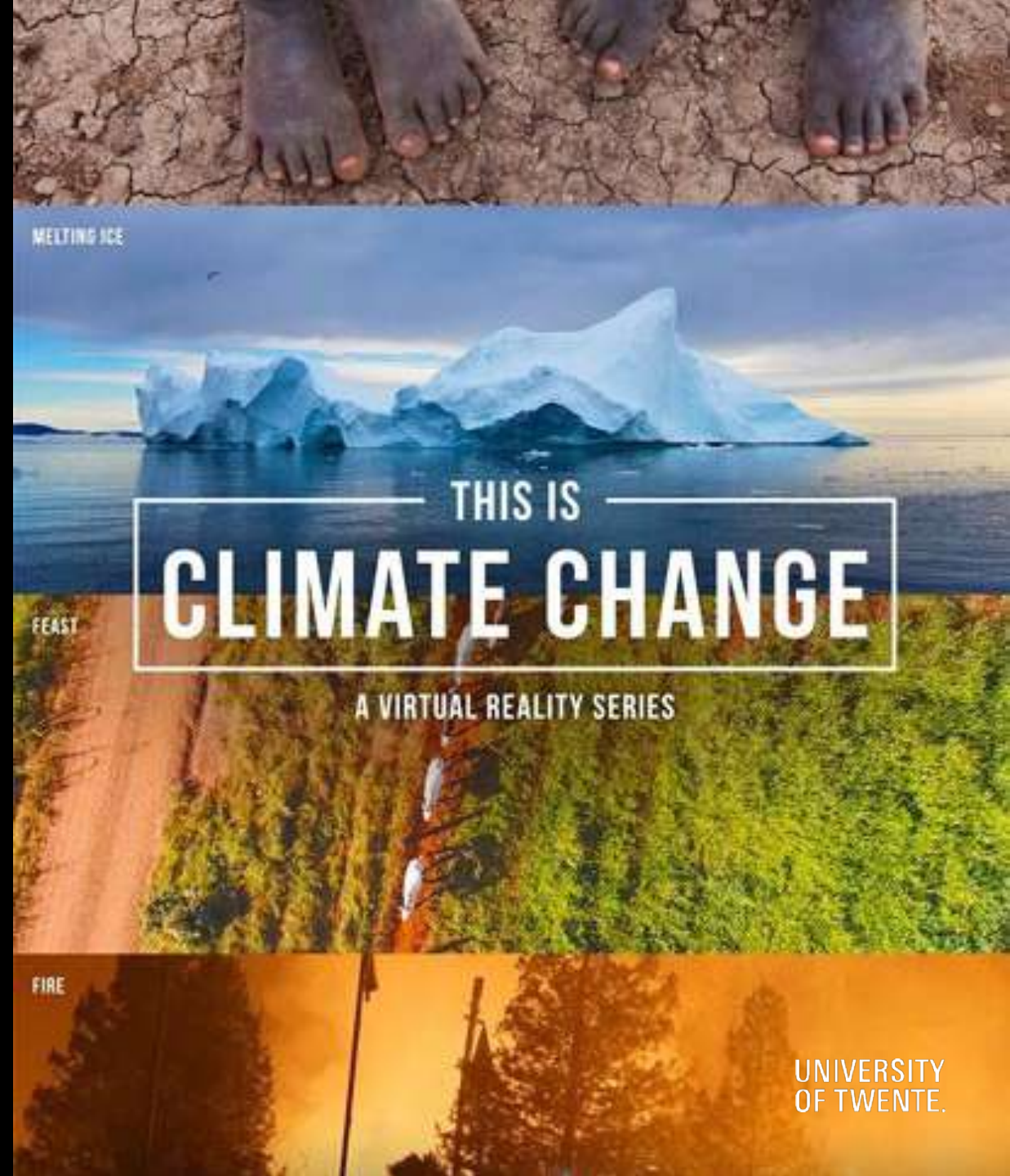
WHY XR FOR BEHAVIOR CHANGE?

- **Emotional engagement** enhances personal responsibility
- **Increased sense of agency** motivates real-world action
- **Stronger memory encoding** of impactful experiences



VR AND ENVIRONMENTAL AWARENESS

- Climate change **awareness** (Thoma et al., 2023)
- Encouraging climate **action** (Ferris et al., 2020)
- **Recycling** behavior promotion (Escudeiro, 2022)
- **Dietary** shifts toward sustainability (Plechata et al., 2022)
- **Empathy** for climate impact (Ventura et al., 2020)
- VR reduces **psychological distance** to environmental issues
- Increases perception of climate risks and sustainability concerns



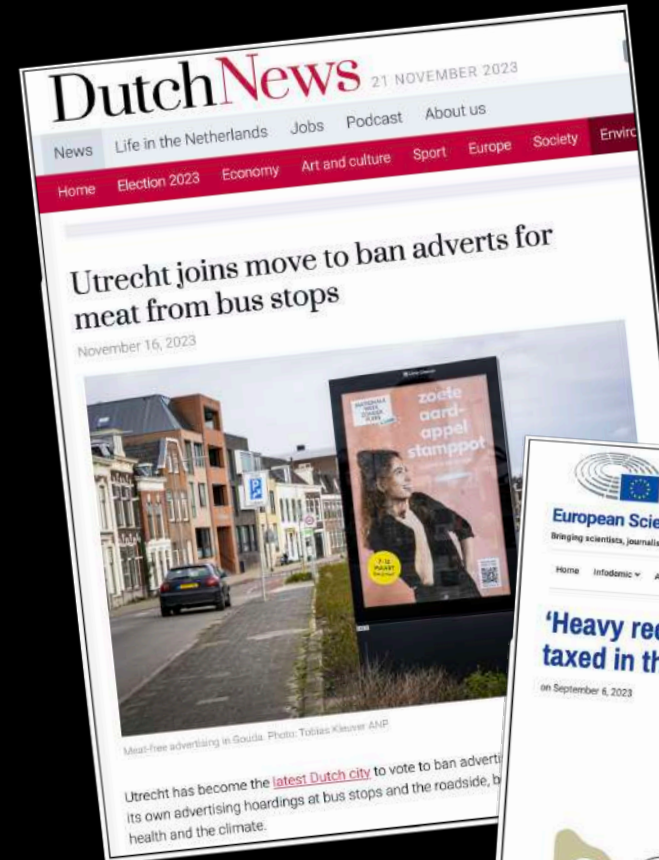
CONTROLLING CONSUMPTION PREFERENCE

SENSORY FACTORS



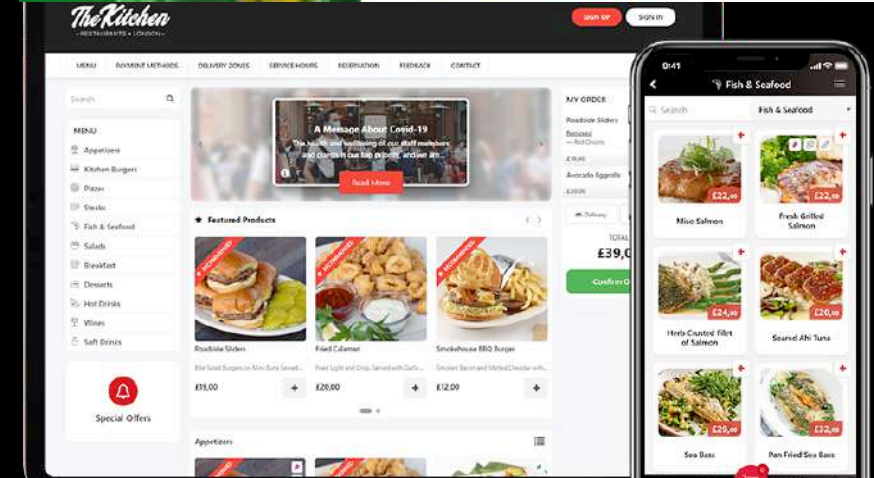
POPULATIONS OFTEN FAIL TO MEET DIETARY RECOMMENDATIONS

- Poor eating habits harm the **environment**, fueling **climate change** by releasing **harmful gases**, contributing to **deforestation**, and depleting **resources**
- **Conflicting information** about what constitutes a **healthy diet**, and this can create confusion and make it **difficult** for consumers to make **informed choices**



ARE CONSUMERS IN CHARGE OF THEIR DAILY CHOICES?

- Advertising, product availability, packaging, where products are placed, cultural norms influence decisions
- Colorful packaging and other tactics designed to **appeal audiences** or create a sense of **urgency** or craving, can lead to overconsumption
- “Healthy” products may be marketed as such but may contain unhealthy ingredients or have little nutritional value



BACKGROUND

- **Product messages** get across to consumer via **colors** (red-tasty, green-sustainable, blue-healthy) & texture (soft-friendly)
- **Task:** Participants '**shopped**' **nine** packaged **products** before camping in a virtual supermarket

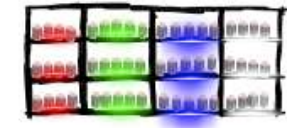


Visual

PACKAGING



SHELF LIGHTING



AMBIENT LIGHTING



AIM

- Does color influence **purchase intentions** across **varying light sources**?
- How does perceived **texture** in virtual environments impact **perceptions of sustainability**



Haptic

SMOOTH



SHINY



ROUGH



MATTE



SMOOTH



SHINY



ROUGH



MATTE



KEY FINDINGS (Preliminary)

- Color effect: **green** is strongly associated with healthiness and sustainability, followed by **blue**; **red** is least healthy & sustainable
- No effect of color source on perception
- Perceived sustainability of haptic attributes influences purchase choice

IMPLICATIONS

- Information might be moved away from packaging, towards environment, it would be possible to **control & re-categorize food for consumers**
- Haptic feedback influences sustainability consideration in purchase decisions



ECO-FRIENDLY CONSUMPTION THROUGH PERSONALISED FEEDBACK

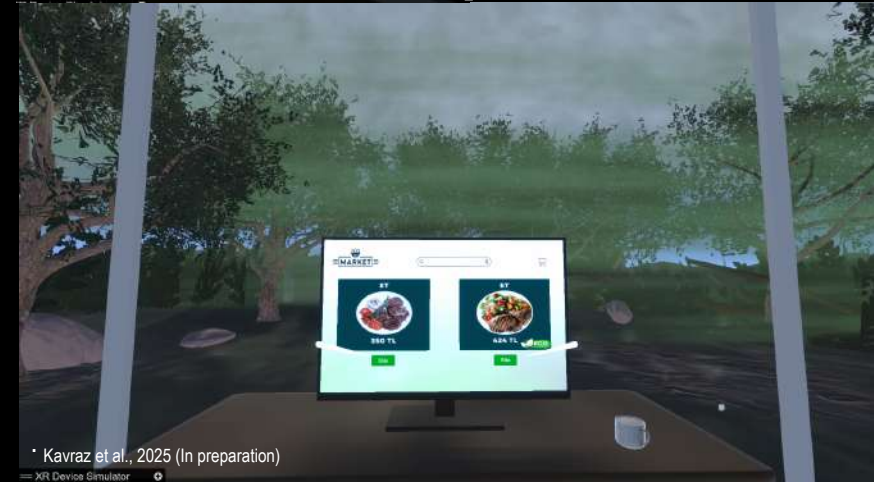


BACKGROUND

- **Feedback** can influence behavior change differently depending on **individual traits**
- Psychological factors (Big Five, locus of control, BIS/BAS) influence behavior change

AIM

- How VR-based **feedback** affects **sustainable** product choices?
- Examine the role of **personality traits** and **control beliefs** in decision-making
- Assess the impact of **feedback type** (positive/negative) on **eco-friendly preferences**

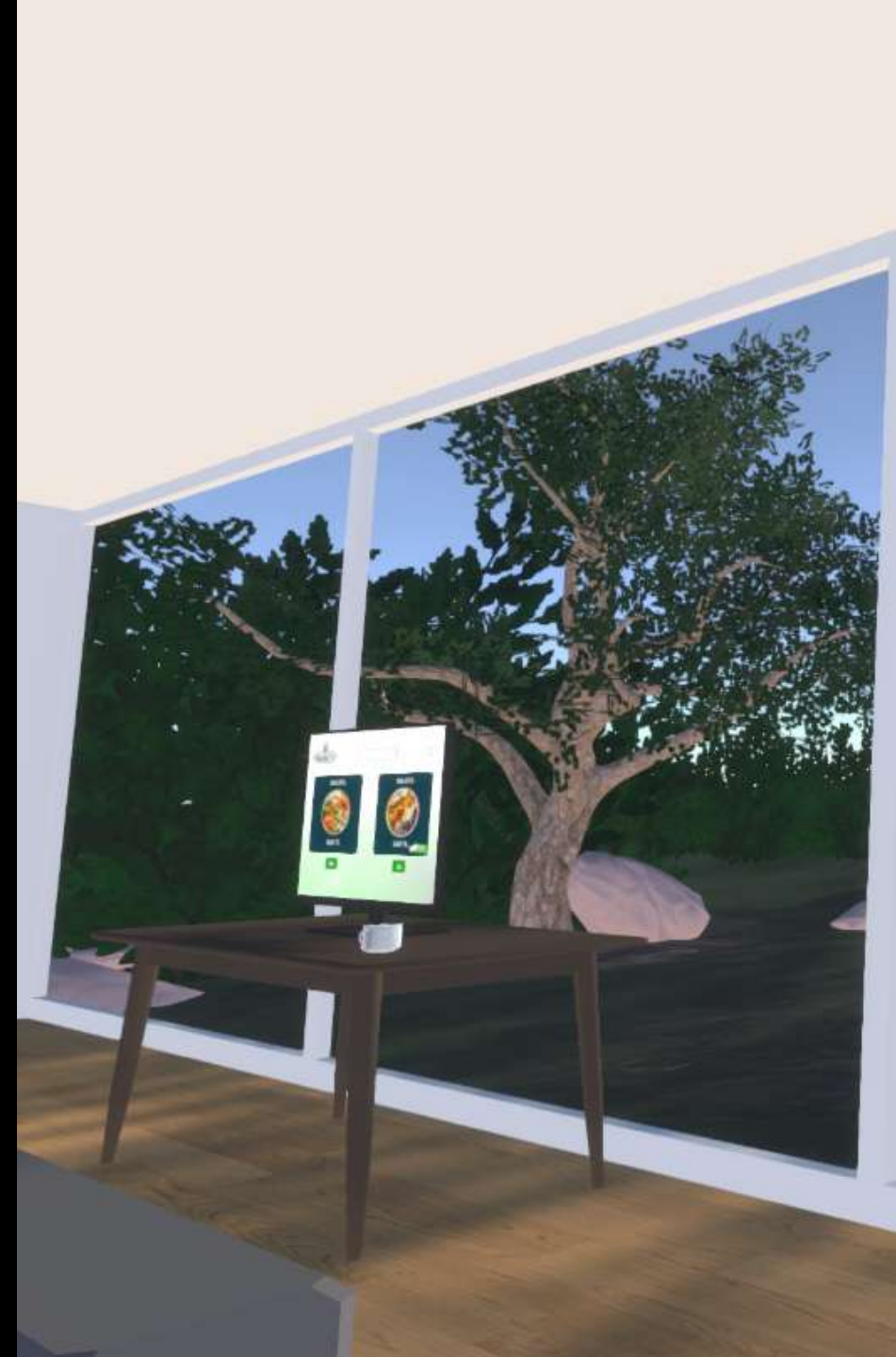


KEY FINDINGS (Preliminary)

- Overall, more **behavioral change** towards **eco-friendly** products when **negative feedback** is used
- Higher **locus of control** correlated with increased behavioral change

IMPLICATIONS

- A strong sense of perceived control over one's environment may empower to believe one's actions can make a tangible difference
- Tailoring feedback to individuals' past behavior, personality traits, and attitudes may enhance its effectiveness in driving behavior change



A pink abstract graphic in the top right corner, resembling a stylized flower or a complex network of lines radiating from a central point.

PRO-ENVIRONMENTAL ATTITUDE AND BELIEFS

CLIMATE CHANGE MISINFORMATION

VR AS A MEDIUM TO BATTLE MISINFORMATION

- Climate change **misinformation diminishes public support** for mitigation measures, hindering investments and **creates social conflict** (Winter etl., 2022)
- **Compare** the effectiveness of the method to the most commonly used correction platform: the **social media**
- Avatars to create an immersive experience that **goes beyond** mere **textual** or **visual** correction



VR-AVATAR



VR-TEXT



SOCIAL MEDIA



The impact of these interventions on **belief** in and **skepticism** toward climate change, and on **inferential reasoning** at three different points **over a month**. Furthermore, we explore the **effectiveness of human actors** and the **level of presence** in the VR experience as strategies to **combat** climate change **misinformation**

KEY FINDINGS

- VR might lead to **increased certainty** in the **belief** that **climate change is really happening**
- **Lowered skepticism** towards the **clarity of the effects** of climate change
- **Avatars** led to increased **heart rate** indicating **greater emotional engagement**

ECOLOGICAL BEHAVIOR PERSPECTIVE TAKING & BEHAVIORAL CHANGE



BACKGROUND

- VEs enhance **perspective-taking** by allowing users to experience events as if they were in the real world
- Perspective-taking in VEs may reduce **psychological distance** from environmental issues.

AIM

- Investigate how adopting an animal's perspective in VEs influences empathy and PEB
- Assess the impact of VEs on **cognitive and emotional engagement** with environmental issues
- Donation behavior is investigated



KEY FINDINGS (Preliminary)

- Perspective-taking may be associated with **increased pro-environmental** behavior
- Early indications point towards a possible increase in **general ecological behavior**, particularly concerning **animals**

IMPLICATIONS

- Immersive experience may be more powerful than non-visual **story telling** in evoking pro-environmental behavior
- Increased empathy, induced by perspective-taking, may contribute to a sequential increase in positive environmental **attitudes, intentions, and behavior**



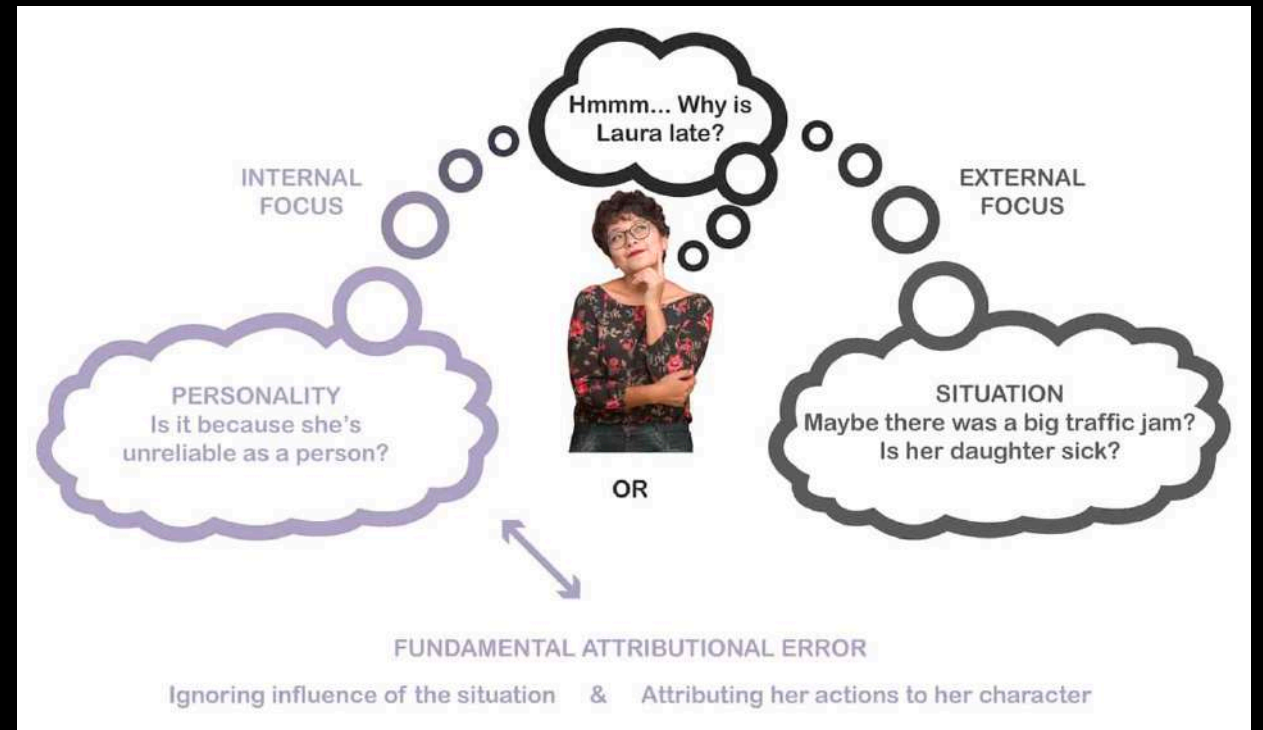
SOCIAL BEHAVIOR **ATTITUDE TOWARDS IMMIGRANTS**



THE ULTIMATE ATTRIBUTION ERROR

Rationalizing positive in-group behavior with dispositional attributions, negative in-group behavior with situational attributions

(Pettigrew, 1979)

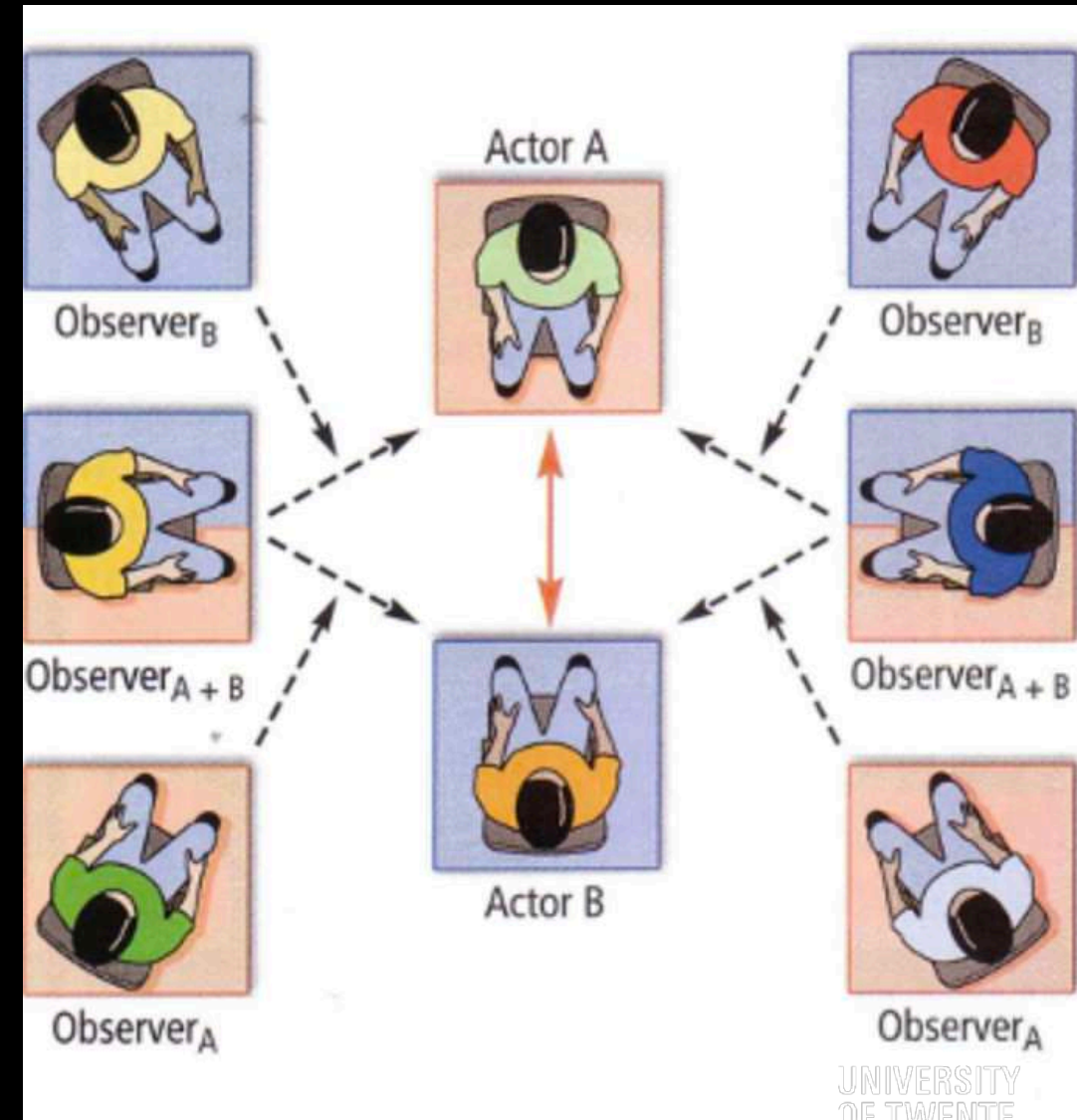


BACKGROUND

- **Causality** higher for the attended actor in perceptual salience

AIM

- Examining the effects of perceptual **salience** and **group status** on the ultimate **attribution error** in a **negative scenario** between **local** and **immigrant intergroup relations**



VIRTUAL DIALOGUE

- One local and one immigrant agent
- A **daily conversation**, information given by one of the agents about the **bus journey** he had coming to the cafe. The bus journey includes a socially negative behavior where the agent tells that his bus ticket **ran out of balance** but he **continued his journey** on the bus, coming to the cafe.
- Post-test questionnaire: comprehension questions, agency/causality attribution questions, ultimate attribution error questions, PANAS (Positive and Negative Affect Schedule) (Watson et al., 1988), Feeling Thermometre



KEY FINDINGS

- **Salience of out-group members** was attributed to their **personal decision**
- **Heart rate** showed notable trend with the feeling of **disgust**

IMPLICATIONS

- VEs offer a significant advantage for investigating **physiological-attribution-behavior** models
- Future research to endorse societal contribution in immigrants



(Akdogdu et al., 2023)

CONCLUSIONS

1. VEs can lead to behavioral change due to reduced **psychological distance**, **enhanced empathy**, and **increased engagement**
2. **More control means less control** in VEs: task, perspective taken, and environmental factors affect attitude and tasks
3. VR interventions can be useful in facilitating **contemplation**, **preparation**, and **action** changes related to **behavioral change**
4. Our studies focus on pro-environmental and pro-social **behavior**, **attitudes**, and **beliefs** ONE aspect at a time
 1. **Sophisticated experimental designs** can help explore the relationships between these mechanisms
5. Assuming that **future** interventions are successful in **training** society to develop **better habits**, various **forms of application** should be considered

THE BIG QUESTION

HOW CAN WE ENSURE THAT IMMERSIVE INTERVENTIONS
ARE USED EFFECTIVELY?

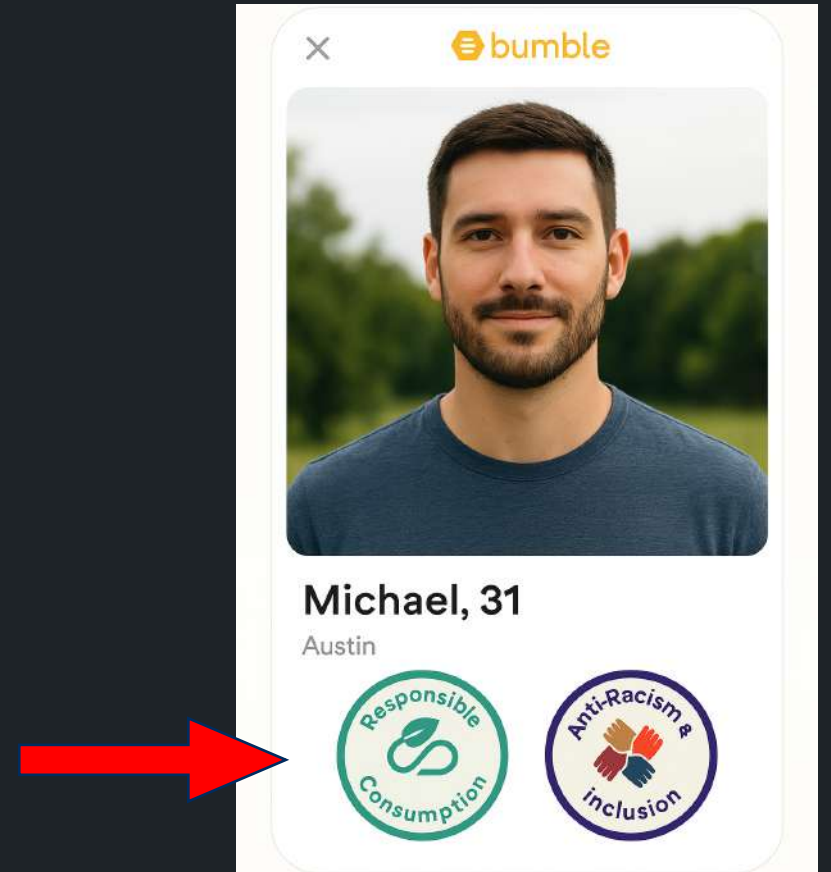
— 4 Cases —



CASE 1 - A BADGE FOR DATING APPS

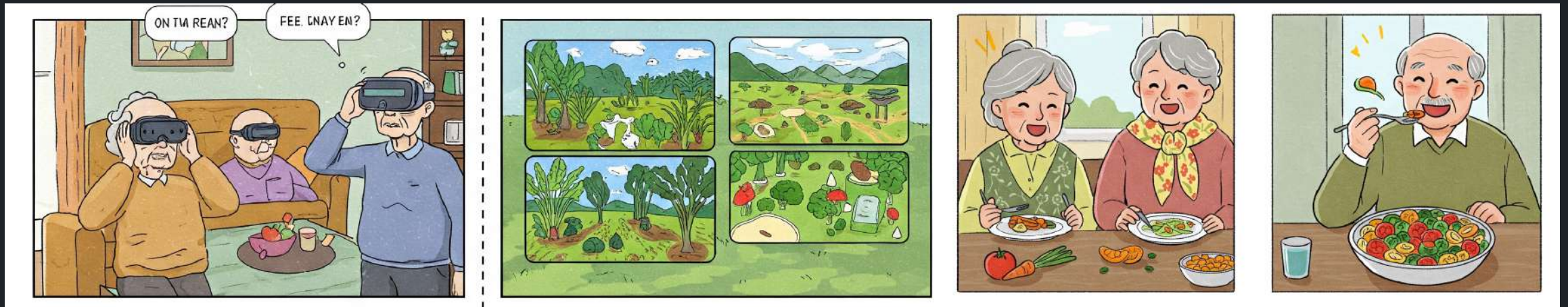
By 2040, dating apps go beyond looks, showcasing **Verified Virtue Badges** earned through **virtual interventions**—immersive VR experiences that train users in sustainability and social justice. Badges like "**Carbon-Neutral Commuter**" and "**Anti-Racism Ally**" reflect **behavioral** data, **verified through simulated** ethical dilemmas, climate challenges, and inclusion **training**.

Love becomes a **force for change**, with matches based on shared values rather than just chemistry. Dating is no longer just about romance—it's about building a future with someone who shares your commitment to a better world.



CASE 2 - LIFELONG LEARNING

“Personal development is a lifelong pursuit. Each day offers new opportunities to learn, grow, and become the best version of ourselves, made even more accessible through virtual interventions.”







CASE 3 - IDENTIFYING BIOMARKERS FOR ANGER MANAGEMENT & MENTAL HEALTH

- Virtual environments designed to simulate real-world **stressors** like frustration, rejection, and threat
- Monitoring of **bodily responses** to find patterns linking physiological **reactions** to **anger management** and **psychopathological** traits
- Use identified **biomarkers** to direct individuals towards **specialized treatment programs**

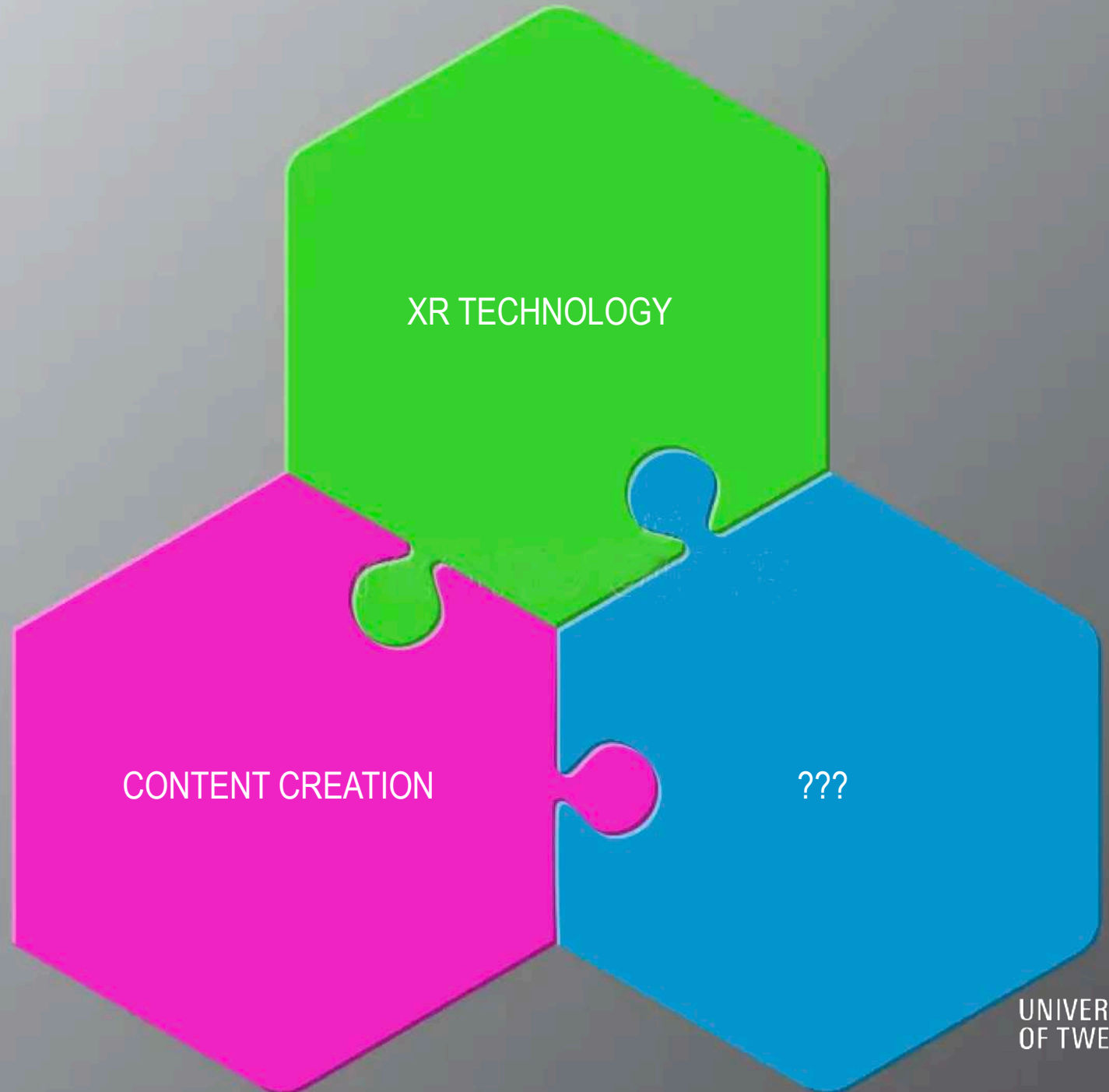


CASE 4 - INVOLVING INTERVENTIONS FOR HUMANITY AND ENVIRONMENTAL CONSCIOUSNESS IN EARLY EDUCATION

	Collective Worship			PM1	PM2
Monday	Mrs Underwood	Maths	PE with Saints @11PM	English	DT
Tuesday	Class Assembly on Google Meet	Waste sorting and ocean travel 	English	Supporting ethical businesses 	PHSE
Wednesday	Miss Penny	Maths	English	Science	Music
Thursday	Ms Rowe	Maths	English	History	RE
Friday	Altruism in animal shelter 	Maths	Inclusive language training DEI friendship 	French	Computing

THE MISSING PIECE

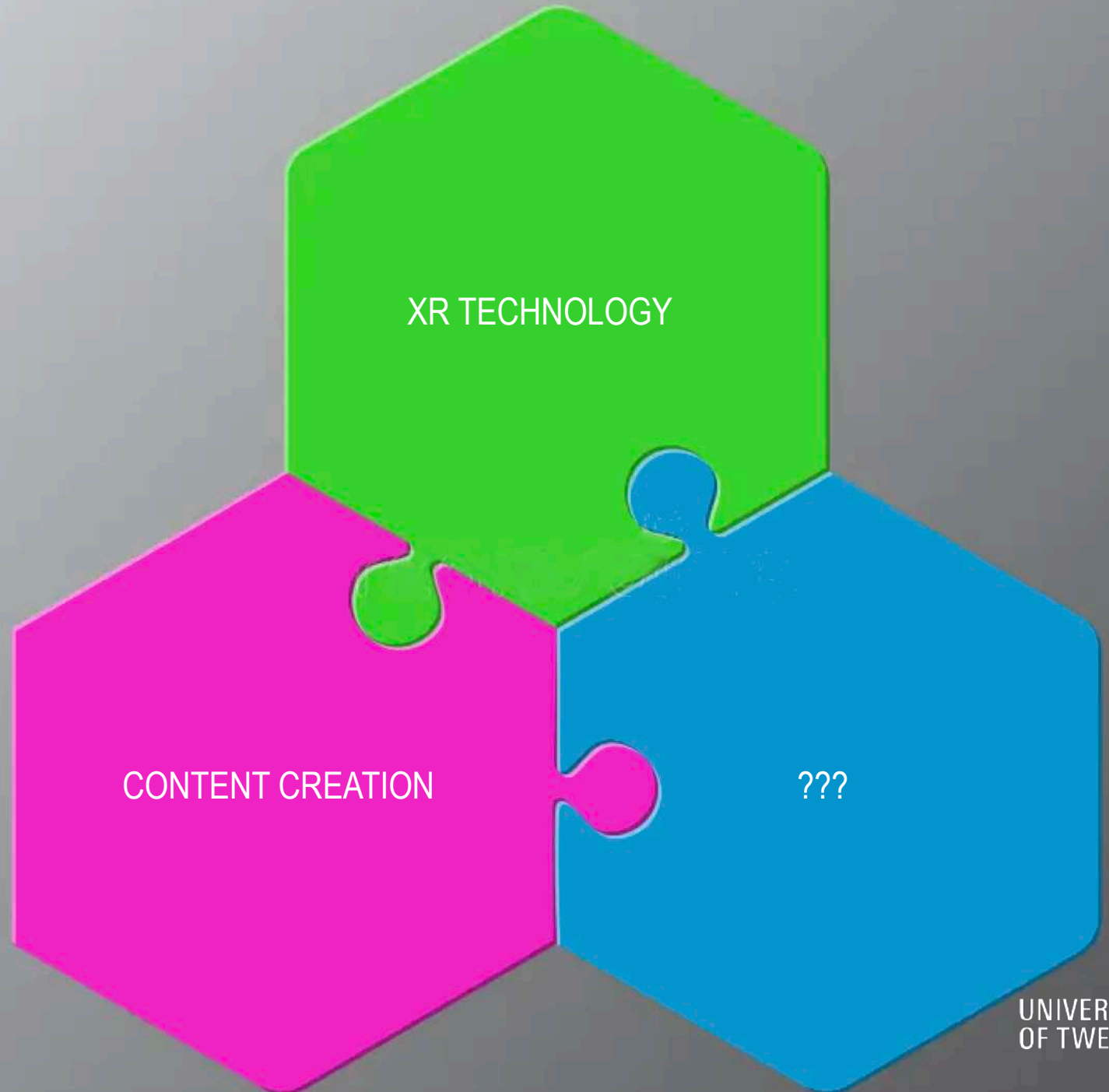
What is the missing piece to
make XR truly impactful?



THE MISSING PIECE

What is the missing piece to
make XR truly impactful?

Funding? Technological
Limitation? Societal Readiness?
or else?



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**THANKS FOR YOUR
ATTENTION!**

TIME FOR QUESTIONS



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