Center for Advanced
Computer-Human Ecosystems
Grady College of Journalism and Mass Communication
UNIVERSITY OF GEORGIA

THE MULTIPLE DIMENSIONS OF SOCIAL IN SOCIAL XR

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EXTENDING REALITIES

FOR BEHAVIOR CHANGE

01 PUBLIC HEALTH
Promoting healthy attitudes and behaviors

02 SUSTAINABILITY
Learning to respect the nature

03 STRUCTURAL INEQUITIES
It’s not up to the individual

04 WHAT’S NEXT
Future directions in media psychological studies

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PHYSICAL ACTIVITY & CHILDREN

- Obesity “epidemic” is impacting children/adolescents
- 1 out of 5 children are obese
- Physical activity plummets once children go to school
- Early childhood provides a window of opportunity
- Lack of access to reliable social support

UNIVERSAL PSYCHOLOGICAL NEEDS FOR BEHAVIOR

AUTONOMY

Minimal external pressure

Maximum choice

“I have the choice”

COMPETENCE

Optimal challenge

Relevant feedback

“I am good at this”

RELATEDNESS

Connection with others

Feeling of belonging

“Someone cares about me”

VIRTUAL FITNESS BUDDY ECOSYSTEM

VIRTUAL PET/KIOSK

Virtual pet guides children's goal setting and provides social support/feedback. Vicarious reinforcement reflected in the virtual pet.

CHILDREN/FITBIT

Minute-by-minute physical activity data collected over 6 months.

PARENTS/PHONE

Parents receive real time updates via text message and can send social support to their children.

DASHBOARD

Track physical activity data over time for family to review

FIRST PROTOTYPE

RESULTS FROM PILOT STUDIES

01

STUDY 1

AHN ET AL., 2015, *JOURNAL OF HEALTH COMMUNICATION*

Children with virtual pet exercised 1.09 hours/day more than children without a virtual pet. Self-efficacy is critical for positive PA belief.

02

STUDY 2

AHN ET AL., 2016, *CYBERPSYCHOLOGY, BEHAVIOR, & SOCIAL NETWORKING*

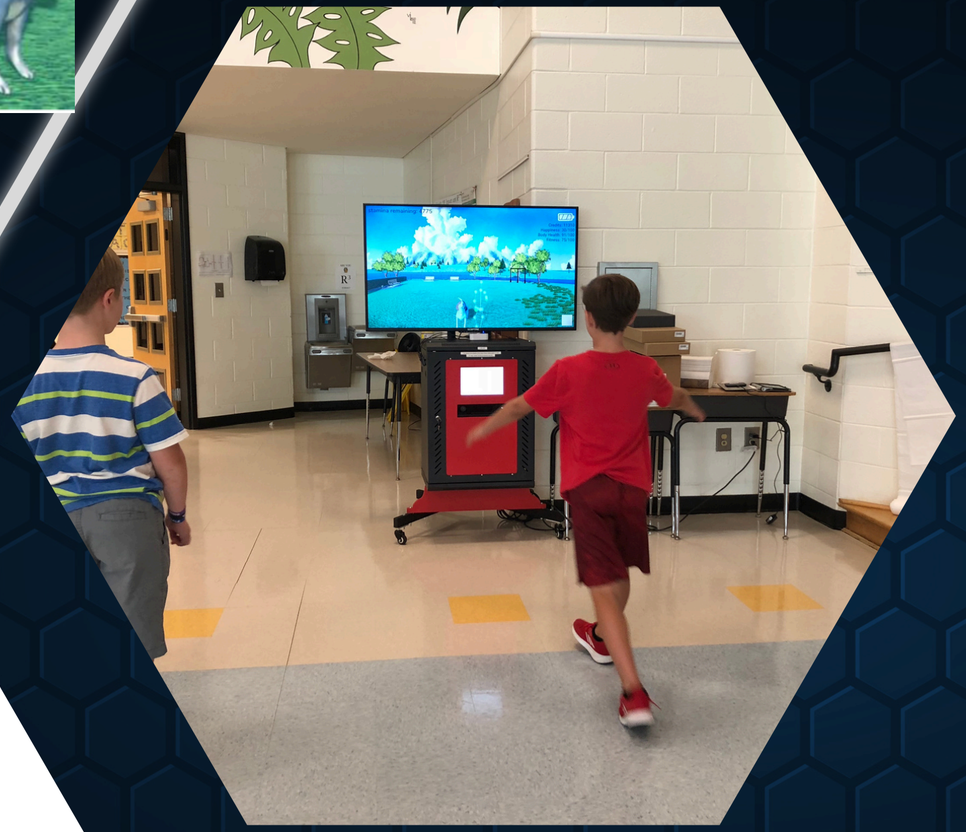
Virtual pet successfully guides children through the goal-setting process and heightens motivations for behavior change.

03

STUDY 3

AHN ET AL., 2019, *HEALTH EDUCATION & BEHAVIOR*

Increase in PA achieved through point-based rewards is short lived and strategic. Children feel high relatedness with the virtual pet.



CLINICAL TRIAL

YMCA OF METRO ATL

- 19 afterschool program
- Data from over 900 parents and children
- 6 month data collection

STUDY DESIGN

- Treatment vs Control
- 3 waves of data
  - Survey
  - Weight, Height, BMI
  - Actigraph
- Minute-by-minute Fitbit data

PRELIMINARY FINDINGS

01

STUDY 1

HAHN ET AL., 2020, *CYBERPSYCHOLOGY, BEHAVIOR, & SOCIAL NETWORKING*

Autonomously tracking and assessing self-determined physical activity goals through the VFB Ecosystem is feasible and acceptable.

02

STUDY 2

BALL ET AL., 2022, *IEEE COMPUTER GRAPHICS AND APPLICATIONS*

The challenges of place and space in scaling a MR-integrated intervention requires theory-driven design iterations and community buy-in.

03

STUDY 3

SCHMIDT ET AL., 2022, *MEASUREMENT IN PHYSICAL EDUCATION AND EXERCISE SCIENCE*

Validation of Fitbit measures against research grade Actigraph measures for young children (6-11 yrs).

PRELIMINARY FINDINGS

04

STUDY 4

BALDWIN ET AL., 2023, *JOURNAL OF COMPUTER-MEDIATED COMMUNICATION*

The VFB Ecosystem elicited more social support from parents of girls vs. parents of boys. Social support from the virtual pet increased perceived relatedness and positive physical activity attitudes over time.

05

STUDY 5

AHN ET AL., NPJ DIGITAL MEDICINE

The VFB Ecosystem is efficacious in converting sedentary behavior into light-intensity physical activity, particularly for children with low baseline moderate-to-vigorous intensity physical activity. Highest impact in first 3 months.

06

STUDY 6

NI ET AL., IN PREPARATION

Analysis of minute-by-minute data. Preliminar data suggests that VFB Ecosystem slows decay of treatment in ensuing days (vs. control).

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COMMUNITY-BASED PARTICIPATORY RESEARCH

- People don’t feel personal threat by climate change
- Temporal gap feels wide and distant
- Guilt and fear lead to inconsistent results
    - Psychological reactance, avoidance
- ***Positive affect*** (e.g., connectedness to nature, empathy with nature may) be more effective
- Communication must be ***relevant***

STUDY 1

HOW IMPORTANT IS EFFICACY IN GETTING PEOPLE TO CARE?

EPPM: Threat alone is not sufficient

FRANK ET AL., IN PREPARATION

STUDY 1

HOW IMPORTANT IS EFFICACY IN GETTING PEOPLE TO CARE?

Study Design

- All participants in VR
- Threat only vs. Threat + efficacy
- *N* = 100

Preliminary Findings

- Threat + efficacy leads to higher issue involvement, mitigation intentions
- Issue involvement
  - Hope is important
  - Doubt is not
- Mitigation intentions
  - Self efficacy is important
  - Threat is not

FRANK ET AL., IN PREPARATION

STUDY 2

CAN YOU FEEL PSYCHOLOGICAL OWNERSHIP OVER VIRTUAL ITEMS?

Study Design

- All participants in VR
- Customize vs. Pre-set
- *N* = 45

Preliminary Findings

- Psychological ownership is key
- Drives negative affect
  - Not threat of hurricane
  - Not spatial presence
- Feeling like users own the virtual objects has important design implications
  - Virtual theft (e.g., not just identity, but also objects)
  - Effective risk communication

TRANSLATIONAL SCIENCE

SCIENTIFIC FINDINGS WITH REAL WORLD IMPACT IN COMMUNITIES

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HOME ABOUT RESEARCH PEOPLE RESOURCES NEWS PARTNERS

STEP INTO THE EYE OF THE STORM—BEFORE IT'S TOO LATE.

Weather the Storm is an **immersive virtual reality experience** designed to help coastal residents **understand the true dangers of hurricanes**—without putting their lives at risk. Developed by a multidisciplinary team of researchers, this simulation places you inside a **coastal home as a major storm approaches**, letting you experience the escalating wind, rain, and storm surge **firsthand**.

BRING "WEATHER THE STORM" TO YOUR COMMUNITY

This immersive experience is available for **community events, schools, training workshops, and emergency preparedness programs**. Whether used as a quick awareness tool or as part of a comprehensive education program, the Weather The Storm VR experience and its accompanying modules empower communities with the knowledge to stay safe and resilient.

TANDEM EDUCATION MATERIALS

For educators and facilitators looking to integrate VR into structured learning sessions. Each module is designed to stand alone or be combined for deeper engagement, ranging from quick 15-minute lessons to half-day workshops.

Every module includes:

1. An **educational video**
2. A **self-narrated PowerPoint presentation**
3. **Discussion questions**
4. A hands-on **activity** aligned with key storm surge topics

These modules are designed for **community leaders, informal educators, and emergency management professionals** who want to lead discussions on hurricane preparedness and resilience.

⚠ This VR simulation creates a lifelike, immersive depiction of severe flooding, which may trigger strong physical or emotional responses. If you are prone to distress or discomfort in high-intensity situations, please consider your well-being before participating.

TRAINING MODULES

- **Introduction to Hurricanes**
  Understand hurricane formation, intensity, and how storm surge develops.
- **Hurricane Risks and Changing Conditions**
  Explore the factors that increase hurricane risks, including climate change and urban development.
- **Short-Term Hurricane Preparation**
  Learn essential steps to safeguard homes and communities before a storm hits.
- **Resilience to Hurricanes**
  Discover long-term strategies for building hurricane-resilient communities.
- **Post-Hurricane Recovery**
  Navigate the aftermath of hurricanes, from emergency response to long-term recovery efforts.

DOWNLOAD MODULES

HURRICANE VR EXPERIENCES

- **Short Demo Experience (1 min 40 sec)** – Ideal for high-traffic events, providing a brief but impactful awareness of hurricane threats.

DOWNLOAD DEMO

- **Full VR Experience – Part 1 & Part 2** – Designed for those with more time to engage, these sections allow for a deeper exploration of storm surge risks and community preparedness.

DOWNLOAD PART 1

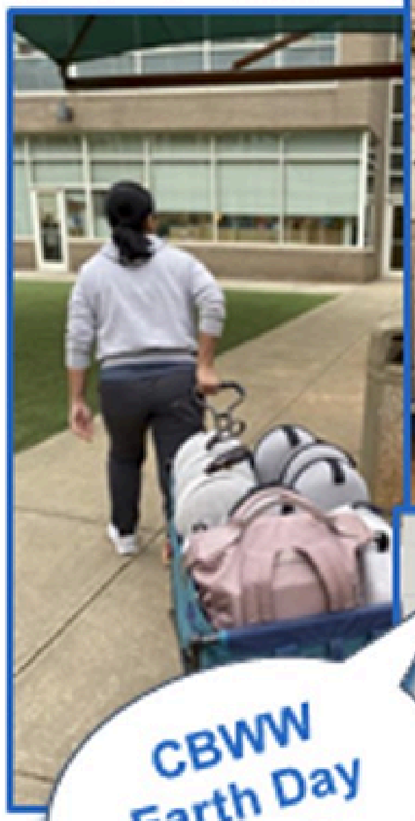
DOWNLOAD PART 2

Download VR + education materials:

https://www.ugavr.com/weatherthestorm

~ 3000+ visits per month

Virtual Reality Community Events



ATL Science Festival 2023

Partnerships with CBWW & CGHI

Science ATL's Imagining the Future Day

CBWW Earth Day Event

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04 FUTURE/WHAT’S NEXT
Future directions in media psychological studies

HEALTH AND (IN)EQUITY

- Most significant predictor of individual health/longevity
  - The air you breathe
  - The water you drink
  - What you eat
  - **ZIP CODE**
- Years of structural inequity built up
- Individual choices are limited

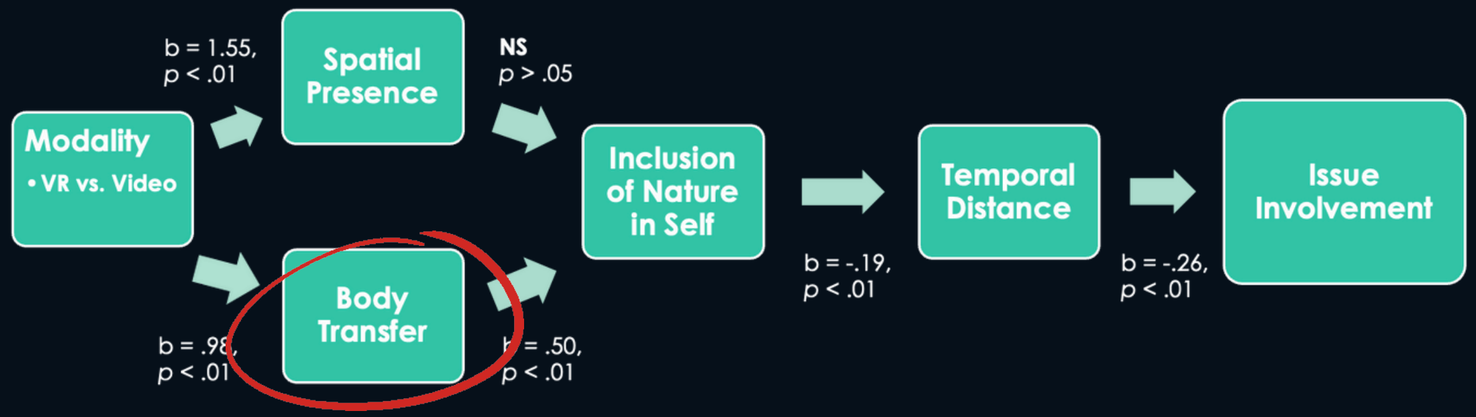
AHN ET AL., 2016, *JOURNAL OF COMPUTER-MEDIATED COMMUNICATION*

STUDY 1-3

CAN WE EMBODY NON-HUMAN ENTITIES IN NATURE?

Study Design

- Embodying a short-horn cow, VR vs. video (*N* = 54)
- Embodying a body of coral, VR vs. video (*N* = 53)
- Embodying a body of coral, VR vs. video (*N* = 126)
- Body transfer important for INS



HATFIELD ET AL., 2022, *JOURNAL OF COMPUTER-MEDIATED COMMUNICATION*

STUDY 4

USING VIRTUAL ENVIRONMENTS TO STUDY RACIAL PREJUDICE

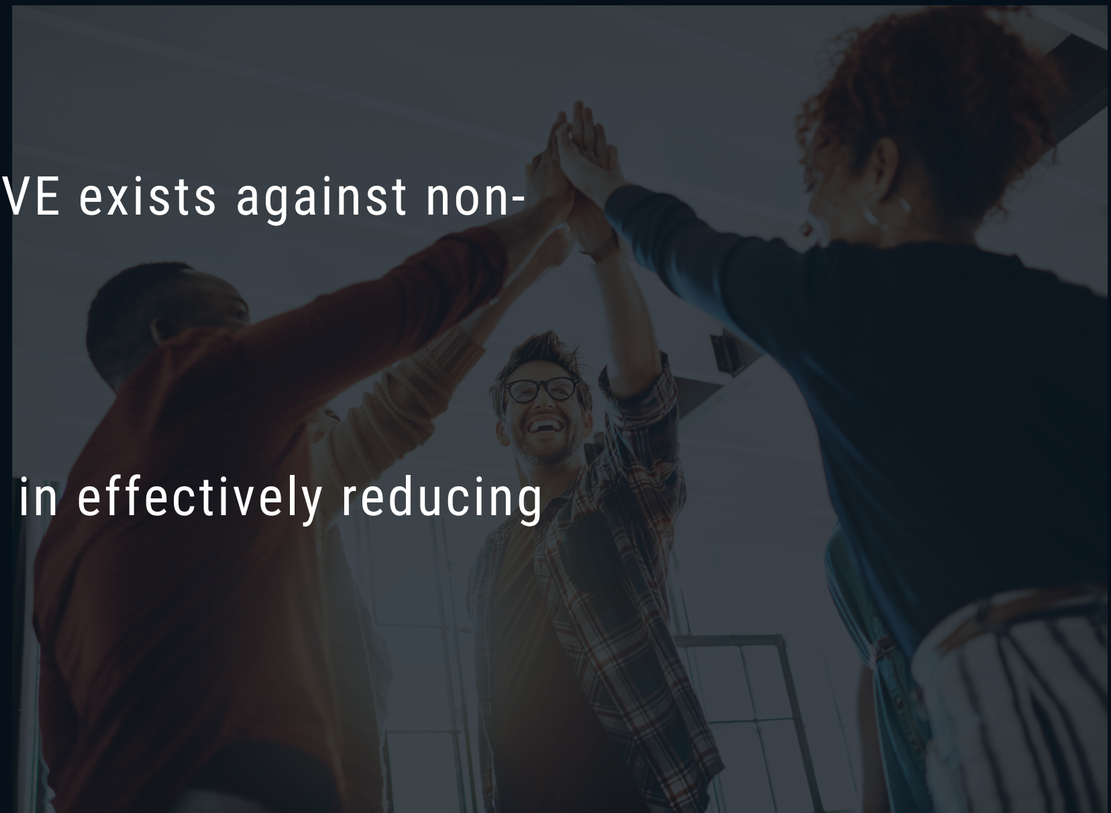
Study Design

- Systematic literature review
- 20 years of research on racial prejudice and bias
- Any virtual environment (video games, VR, etc.)
- Final sample = 68 articles (~9,000 participants)

Main Findings

- 61 out of 68 studies establish that racial bias in VE exists against non-white avatars
  - But little focus on resolutions
  - Studies may be strenghtening status quo
- Embodying a dark skinned avatar is not effective in effectively reducing racial bias/prejudice
  - “virtual Blackface”
  - identity tourism (Lisa Nakamura)

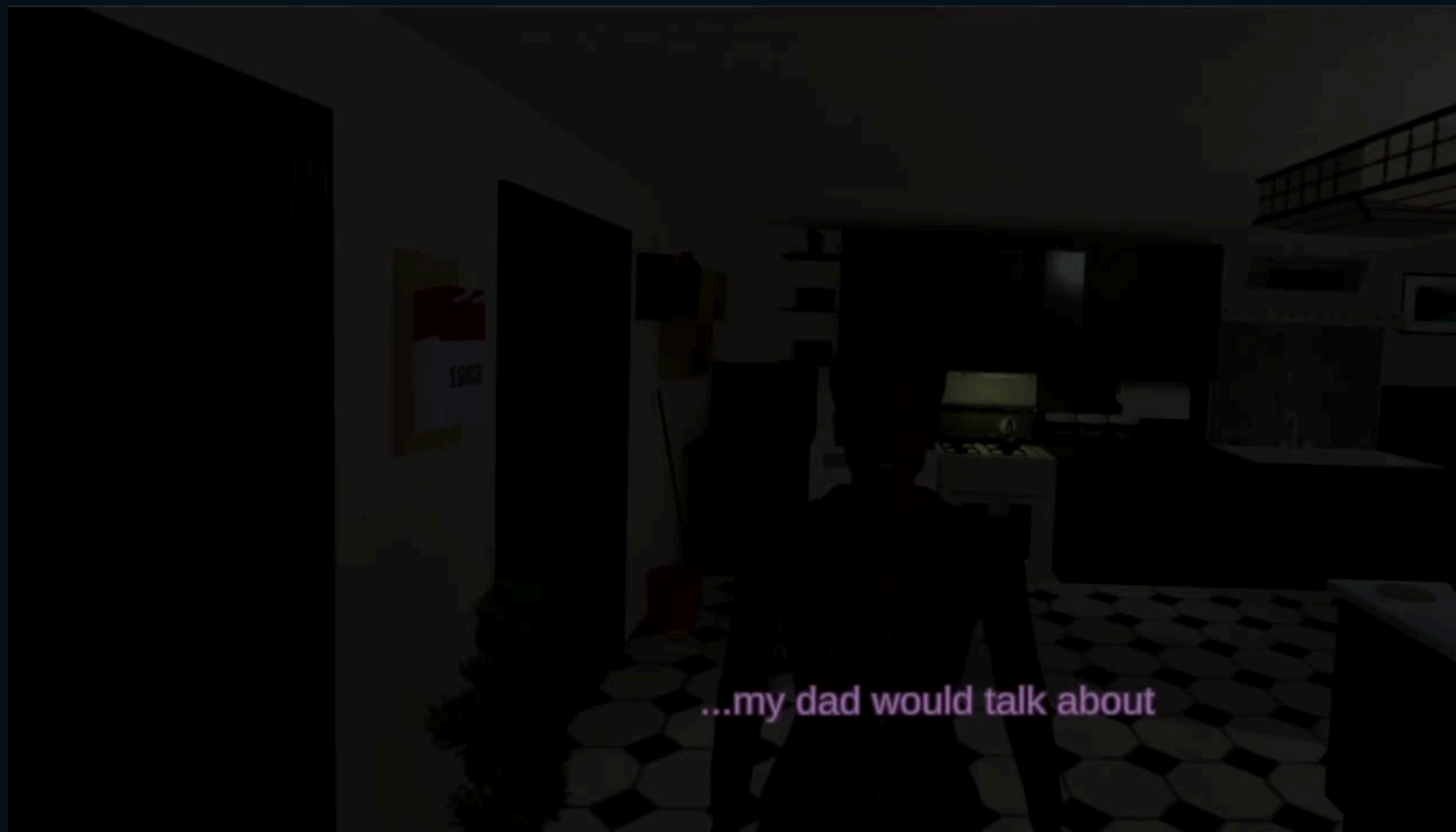
Design experiences to share WITH, not share AS

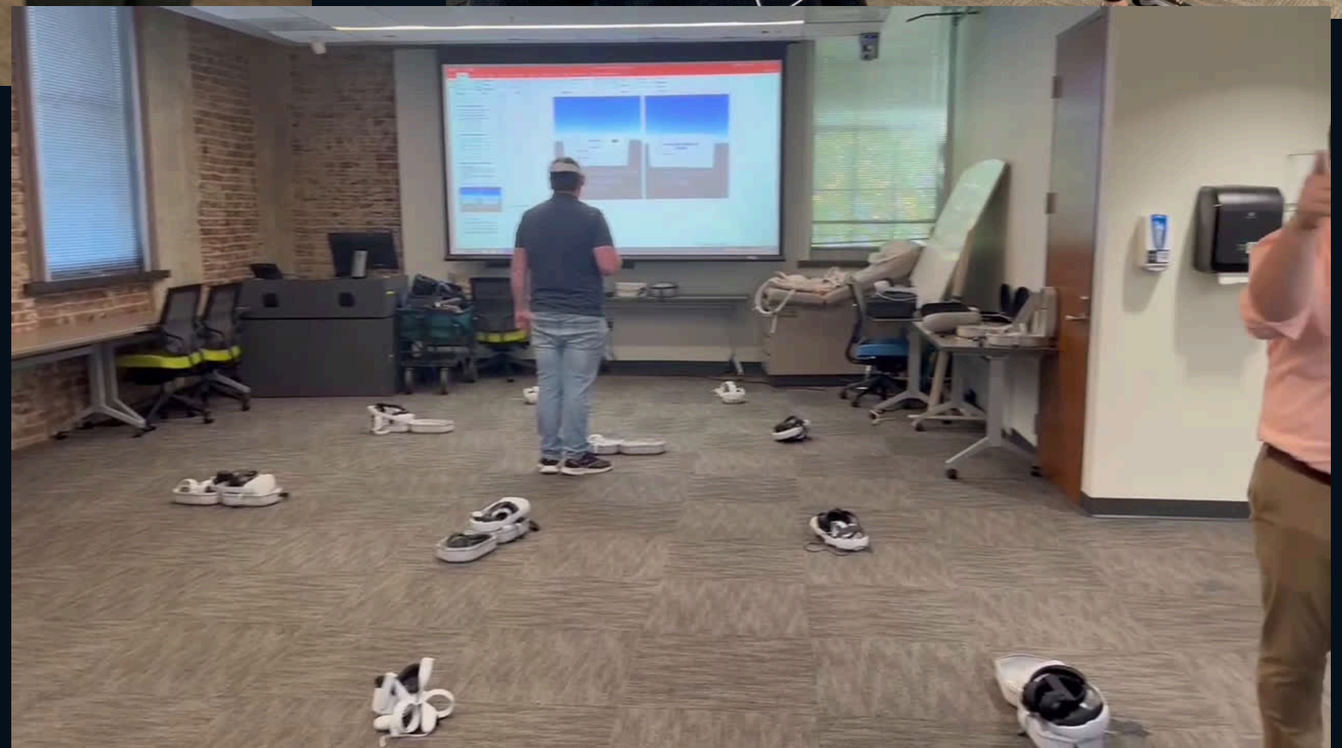


STUDY 5

SHARING REALITIES THROUGH SHARED EXPERIENCES

Shared reality: the experience of having in common with others inner states about the world





Medical Student Training

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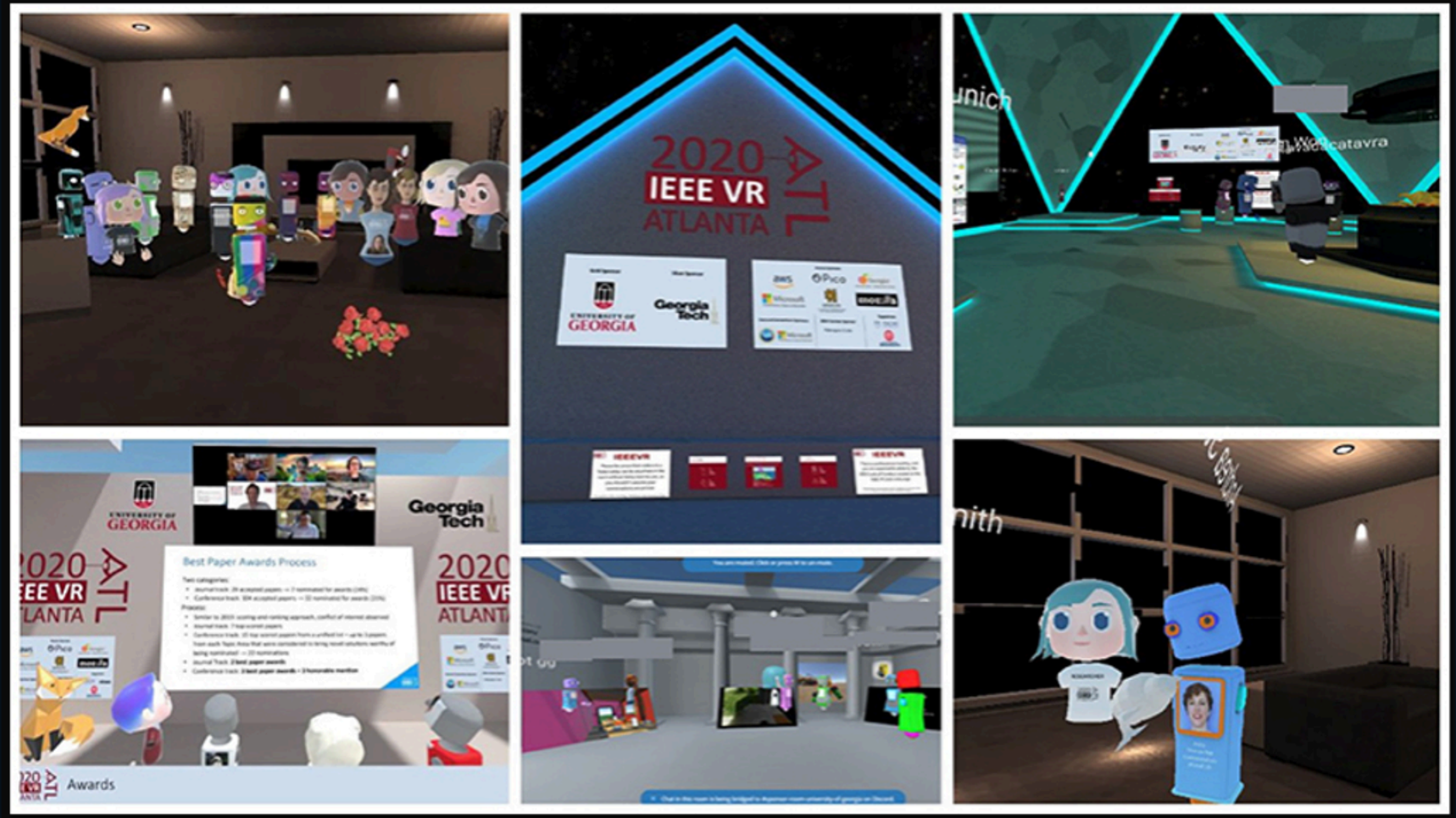
What's on our minds now?

Future directions in media psychological studies

AHN ET AL., 2021, *FRONTIERS IN VIRTUAL REALITY*

VIRTUAL CONFERENCING

HOW CAN WE EFFECTIVELY CONFERENCE IN SOCIAL XR?



Earlier Findings

- Social presence is highest in VR (vs. 2D)
- But people (even VR researchers) hate using VR
- VR conferences need to work around friction
- Social VR “salons” have been effective
- Quick, short bursts of activity vs. long days

LEE ET AL., IN PREPARATION

MORALITY

WHEN AFFECT GETS IN THE WAY OF MORAL DECISIONS

Preliminary Findings

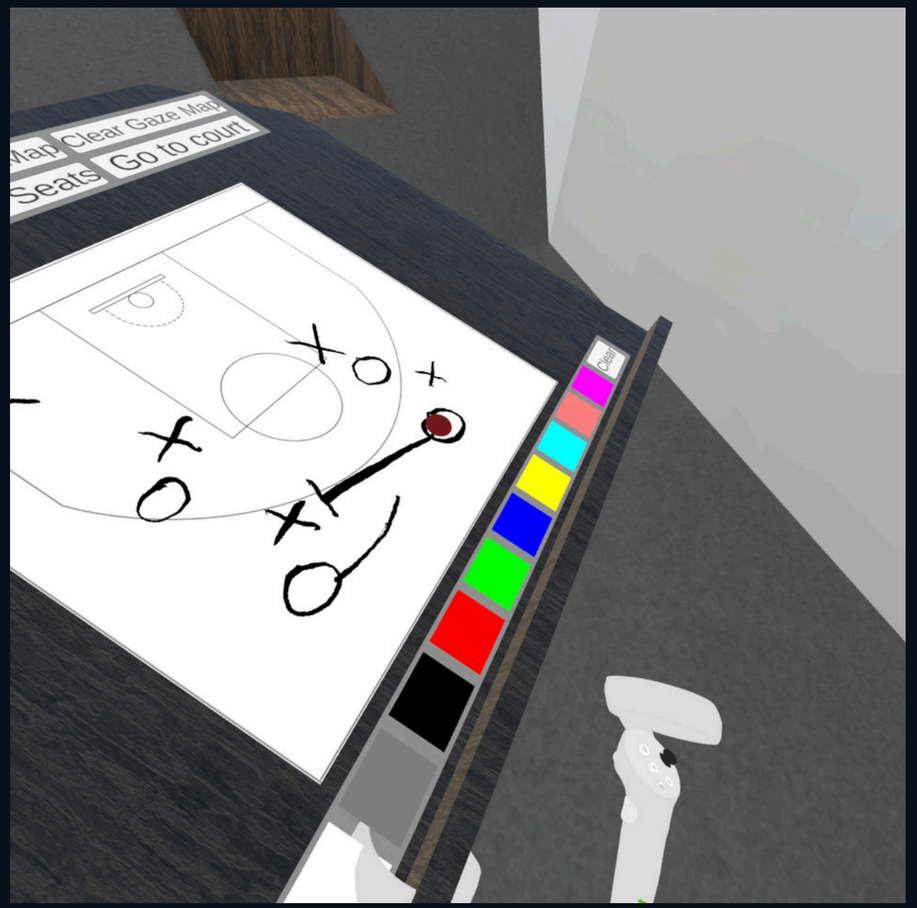
- High threat in VR (pit)
- Increase in arousal
- Decrease in perceptions of harm to others
- More likely to make self-serving choices

NOVICE VS. EXPERT

EYE TRACKING TO ACCELERATE DOMAIN EXPERTISE ACQUISITION

Multiuser Eye-tracking

- Synchronous gaze visualization



WHAT'S NEXT

PROGRESS OF MEDIA RESEARCH

MEDIA EFFECTS

One user,
one device

MULTITASKING

One user,
multiple devices

ASYMMETRICAL INTERFACES

Multiple users,
multiple devices

WHAT'S NEXT

PROGRESS OF MEDIA RESEARCH

MEDIA APPROPRIATENESS

Media richness is too simple

SPACE IS IMPORTANT

Being there, Together

LITERACY

You see what you know

MULTIMODAL EXTENSIONS OF REALITIES

FOR BEHAVIOR CHANGE

01 STORIES THAT CAN BE EXPERIENCED

Stories that can be seen, heard, and felt, with tangibly rich sensorimotor details that help people remember them better and longer

02 INTELLIGENT AGENTS AS SOURCE OF SOCIAL SUPPORT

Support on demand, tailored interventions that can meet users where they are

03 GETTING A PRACTICE SHOT AT LIFE'S EVENTS

Better preparation for life's unforeseen events

MULTIMODAL EXTENSIONS OF REALITIES

FOR BEHAVIOR CHANGE

04 TRANSLATION OF ABSTRACT INFORMATION

Communicate critical but complex science information to further and broader audiences

05 CREATING COMMON GROUNDS

Shared experiences in shared spaces are conducive to collective goals

06 THEORY-DRIVEN DESIGNS SHAPE BEHAVIORS

Interdisciplinary science is critical for successful behavior change

THANK YOU

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