University of Glasgow

User Interaction COMPSCI2031

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Housekeeping

[UI] Presentation Assignment: 5% of overall grade

- Submissions were overall good!
- Hope you can all see your grades?

[UI] Evaluation Assignment: 20% of the overall grade

- Hope all went well!
- Any questions re submission?

[UI] Quiz: 15% of the overall grade. What's the plan for tomorrow?

- 10:05 – 10:45: 1st part
  - Quick Revision
  - Final Questions
  - Relaxed
- 10:45 – 11:55: 2nd part
  - Everyone leaves the room and waits outside.
  - Quiz (15%)
    - Start for people without time adjustments: 10:52 (everyone else waits outside)
    - Start for people without time adjustments: 11:05 (pls enter quietly)
    - End for all: 11:55

Recap: What we did last week

- Large-Scale and Mobile HCI
- Hybrid Studies
- Large vs small studies task

User Interaction Topics

1. ✅ HCI History and Introduction
2. ✅ Usability and Heuristics
3. ✅ Heuristic Evaluation and Human Cognition
4. ✅ Human Perception and Capabilities
5. ✅ Experimental Design & Variables Research
6. ✅ Personas and Scenarios
7. ✅ Surveys in HCI
8. ✅ Ethnography
9. ✅ Statistical Methods
10. ✅ Theories in HCI & User-Centered Design
11. ✅ Models of Interaction
12. ✅ Large Scale and Mobile HCI
13. Various Users and Ethics
14. Revision & Quiz

jbq2ns

Example quiz question

Imagine you are a researcher studying how people use smartphones in their daily lives. You decide to conduct an in-the-wild study to observe users in their natural environments. Which of the following is a key advantage of this approach?

a) You can easily replicate the study conditions across different locations.

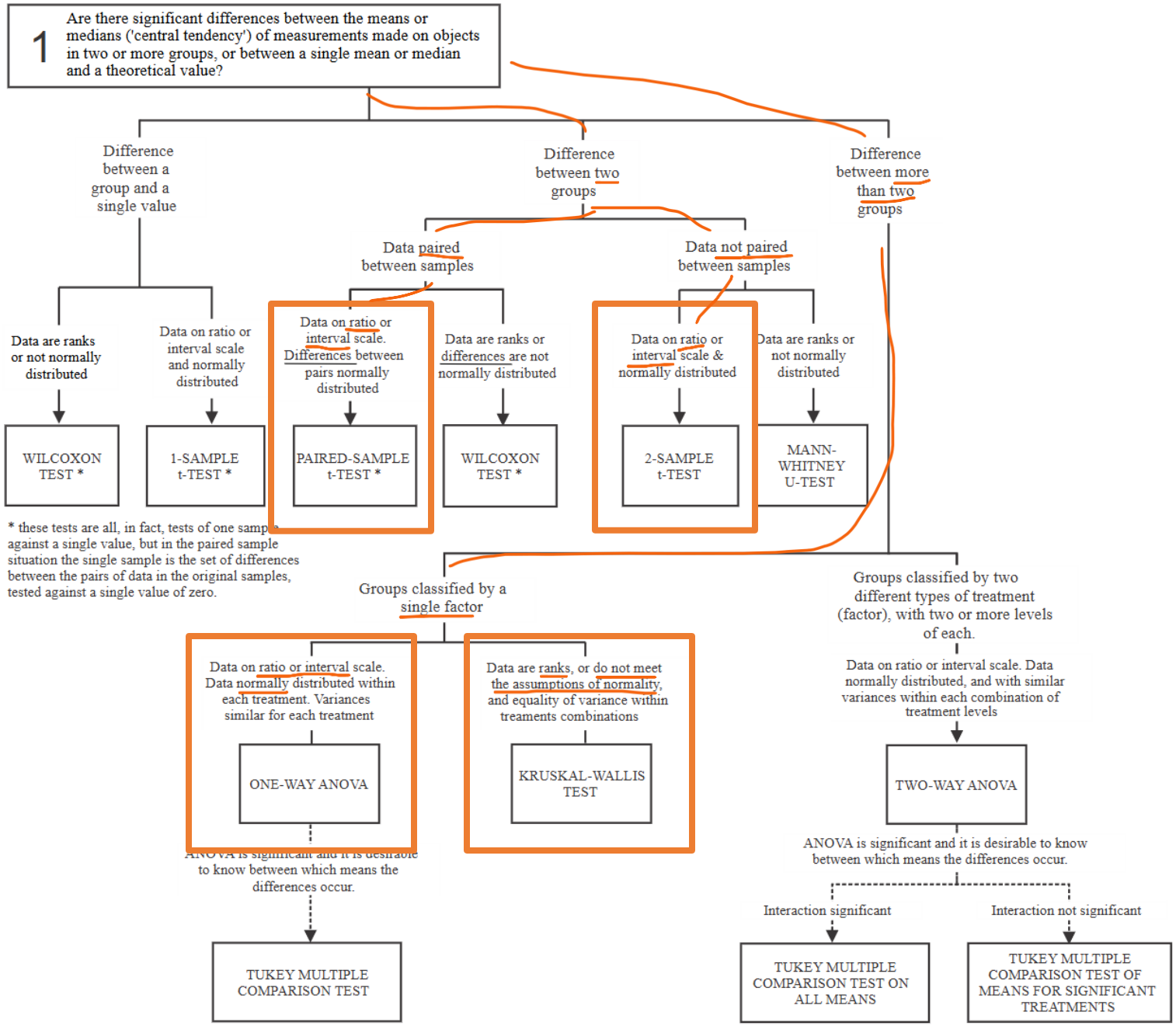
b) You can precisely measure the impact of individual features on user behavior.

c) You can observe genuine user interactions with their smartphones in real-world settings.

d) You can complete the study faster than in a controlled lab environment.

Add-On: Statistic

- Know when to use
- Not how.
- Terminology
  - Ranks = ordinal
  - Paired = within



For reference: https://dzchilds.github.io/stats-for-bio/choosing-models-and-tests.html

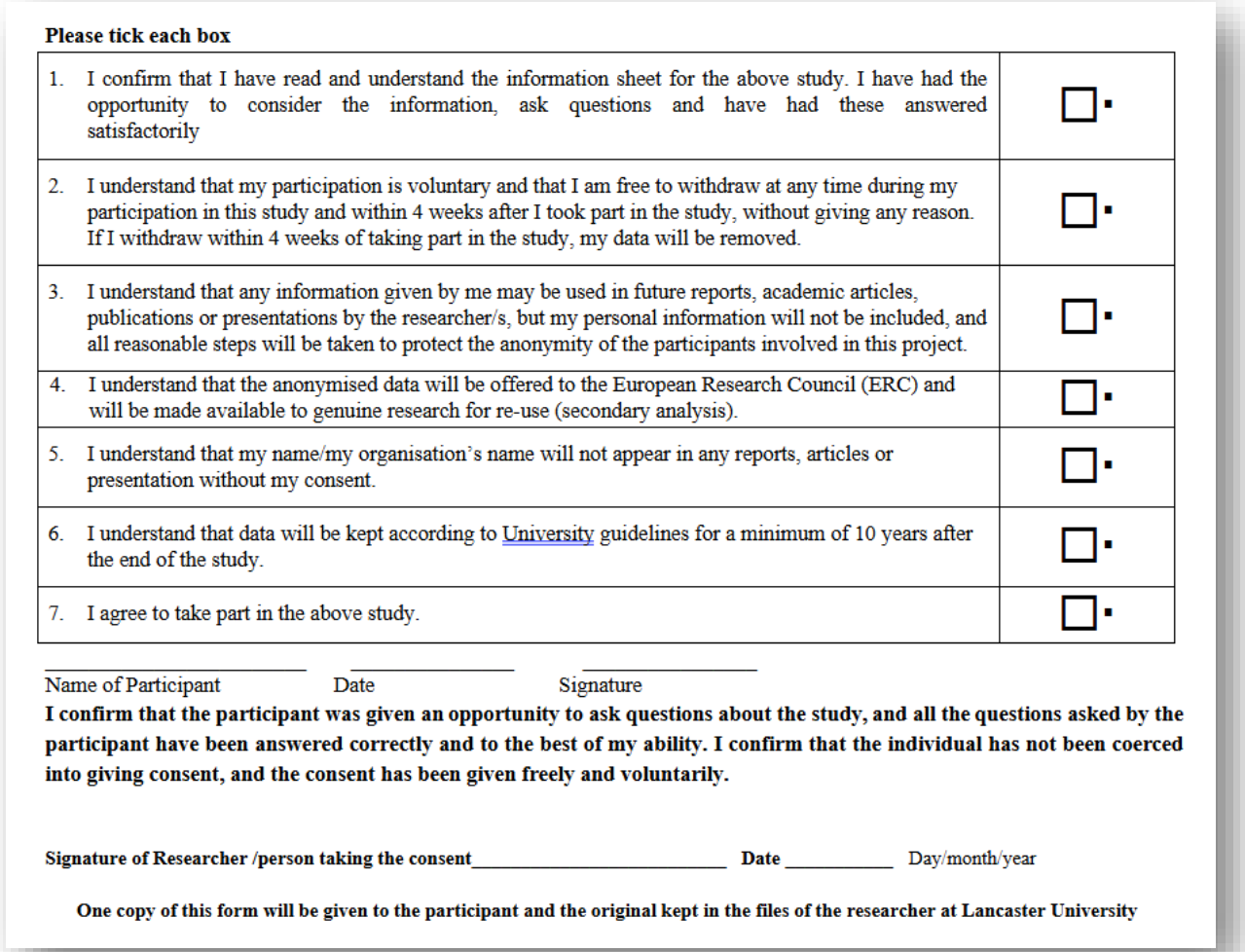
Ethics

Ethics

- Ethics are important in HCI research.
- Often borrow from psychology research
- Crucial notion of informed consent. Inform participants about:
  - Understand
    - nature of research
    - methodology
    - risks or benefits
  - Right not to participate or to withdraw
  - Right to anonymity and confidentiality
- Particular issues in HCI:
  - Work can involve recruitment of vulnerable groups (e.g. when investigating assistive technology), or
  - Deception that might be involved during a study.

Ethical Challenges: Informed consent

- Do people know what we're doing?
- That the itis University research?
- The purpose of the experiment?
- What information is being recorded?
- What will we do with this info?
- How to opt out?



Please tick each box

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily	☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time during my participation in this study and within 4 weeks after I took part in the study, without giving any reason. If I withdraw within 4 weeks of taking part in the study, my data will be removed.	☐
3. I understand that any information given by me may be used in future reports, academic articles, publications or presentations by the researcher/s, but my personal information will not be included, and all reasonable steps will be taken to protect the anonymity of the participants involved in this project.	☐
4. I understand that the anonymised data will be offered to the European Research Council (ERC) and will be made available to genuine research for re-use (secondary analysis).	☐
5. I understand that my name/my organisation's name will not appear in any reports, articles or presentation without my consent.	☐
6. I understand that data will be kept according to University guidelines for a minimum of 10 years after the end of the study.	☐
7. I agree to take part in the above study.	☐

Name of Participant Date Signature

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Signature of Researcher /person taking the consent_____ **Date** _____ Day/month/year

One copy of this form will be given to the participant and the original kept in the files of the researcher at Lancaster University

Terms & Conditions Page

- State the purpose of the study - URL to project site
- All logging explained and must be explicitly agreed to before usage
- Store / transmit data securely
- Email address opt out at any time on request
  → have all collected data destroyed
- Multiple languages If necessary

For further information about how Lancaster University processe
purposes and your data rights please visit our webpage: www.la
protection

My name is [redacted], and I am a PhD student at
like to invite you to take part in a research study about Eye

Please take time to read the following information carefully
you wish to take part.

What is the study about?
This study aims to explore how the dominant eye works in a
how we can test reliably, which is our dominant eye using th
technology. We are replicating an existing eye-dominance t
psychology in a VR setting.

Why have I been invited?
I have approached you because we are looking for voluntary p
corrected via lenses that want to participate in this study do
wearing glasses and can't wear them in VR due to discomfo
contact lenses instead.

I would be very grateful if you would agree to take part in th

What will I be asked to do if I take part?
If you decided to take part, this would involve the following:

Before the study, we will ask you to fill in a short questionna
information which takes 3 minutes to complete.
In the virtual reality task, you will be asked to focus on targe
gaze. You will then "grasp" the ring surrounding the target w
ring towards your face. When doing this, you will be asked t
continuously looking through the ring until you have moved

During the target observations, we will record your eye mov
sessions of data collection, letting you rest in between sess
at any time during the experiment by asking the experiment

The study will take around 60 minutes to complete.

What are the possible benefits from taking part?

If you take part in this study, your insights and data will contr
human behaviour and eye movements in a VR context. This
performance and user experience. You will also receive a **£1**
your time and participation.

Do I have to take part?
No. It's completely up to you to decide whether you take part
and you are free to withdraw at any time, without giving any

What if I change my mind?
As explained above, you are free to withdraw at any time, an
extract any data you contributed to the study and destroy it.
views, ideas, etc. that you will have shared with me. Howeve
impossible to take out data from one specific participant whe
anonymised or pooled together with other people's data. The
up to 4 weeks after taking part in the study.

What are the possible disadvantages and risks of taking
There is a possible risk of experiencing motion sickness in V
low given the design of the study. You will be able to withdra
any discomfort and we will let you rest between sessions.

There is also a risk of hitting objects in the real world when ir
the researcher will ensure that you maintain a safe position d

Participating in the study will require 60 minutes of your time

Will my data be identifiable?
After the study, only I, the researcher conducting this study a
Gellersen will have access to any identifiable data you share
information about you (e.g. your name and other information
confidential, that is I will not share it with others. I will anonyr
hard copies of any data. This means that I remove any perso

**How will we use the information you have shared with us
results of the research study?**
I will use the information you have shared with me only in the
I will use it for research purposes only. This will include my F
publications, for example journal articles. I may also present
academic conferences.

When writing up the findings from this study, I would like to r
ideas you shared with me. I will only use anonymised quotes
you), so that although I will use your exact words, all reasona
protect your anonymity in our publications.

How my data will be stored
Your data will be stored in encrypted files (that is no-one other than me, the researcher will be able to access them) and on password-protected computers. I will store hard copies of any data securely in locked cabinets in my office. I will keep data that can identify you separately from non-personal information (e.g. your views on a specific

v19-09-19

topic).In accordance with University guidelines, I will keep the data securely for a minimum of ten years.

This study is part of the Gemini Research Project funded by the European Research Council (ERC). The funder expects me to make my data available for future use by other researchers. I will exclude all personal data from archiving. I intend to make the data available to the public via Lancaster University's institutional data repository.

What if I have a question or concern?
If you have any queries or if you are unhappy with anything that happens concerning your participation in the study, please contact myself, or my supervisor Hans Gellersen.

[redacted]
A25-27, A - Floor, Infolab21, Lancaster University, LA1 4WA United Kingdom

[redacted]
D16, D - Floor, Infolab21, Lancaster University, LA1 4WA United Kingdom

If you have any concerns or complaints that you wish to discuss with a person who is not directly involved in the research, you can also contact:

[redacted]
C57, C - Floor, InfoLab21, Lancaster University, LA1 4WA United Kingdom

This study has been reviewed and approved by the Faculty of Arts and Social Sciences and Lancaster Management School's Research Ethics Committee.

Do users read the T&Cs?

- Hungry Yoshi study asked!
  - In-app questionnaire: 1,226 responses. Yes: 20% No: 80%
  - Telephone interviews: 11 interviewees. Yes: 0 No:11
- Opening the full T&C document:
  - 75,818 agreed to T&Cs. 2% opened doc
  - Of 2%, nobody spent >60 sec reading the 842 words

Researching Ethics

- Interpreting existing guidelines to cover large scale mobile HCI
- Framework categorizing trials based on participant ‘risk’
- Advice for how to run each type of trial in ethical manner
- Experiments on new ethical procedures

Interpreting Existing Guidelines

- Human trials in Psychology: BPS & APA
  - Autonomy, Dignity, Self-Determination
  - Concern for Others' Welfare
  - Social Responsibility
  - Scientific Value, Integrity, Competence
- Internet-Mediated Research

General Guidelines

- Restrict age of users where stores allow
- Graphics, icon sets, descriptive language
- Terms & Conditions in store description & in- app
- Historic log data not on externally-visible server
- Privacy-preserving data publishing techniques

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Case Study 1:

- Work with human
- Work with cybersickness
- Work with alcohol

→Even necessary?

→Informed Consent

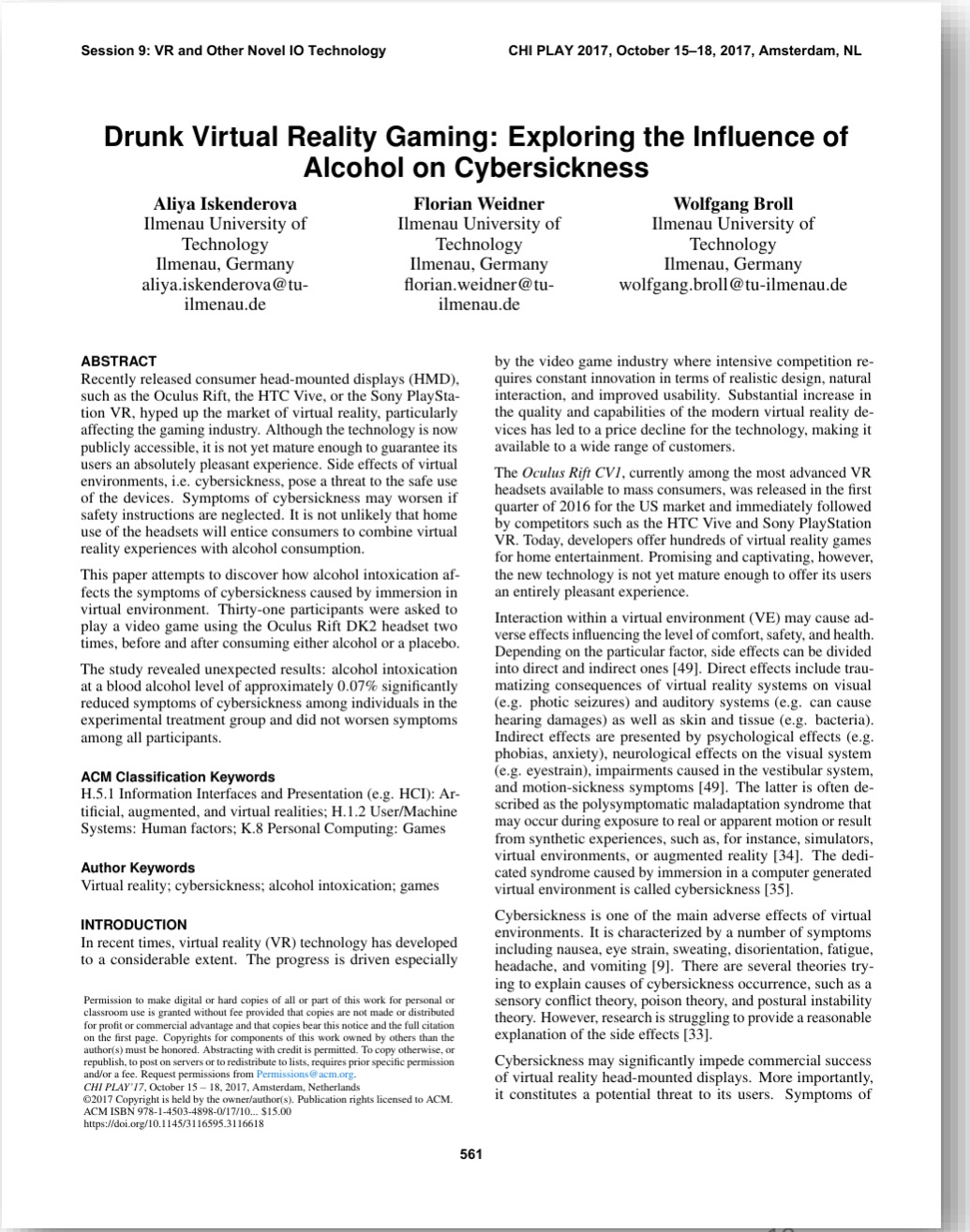
→Screening

→Drug usage

→Susceptibility to addiction

→Medical professionals onsite

→Regular testing during (breath)



Drunk Virtual Reality Gaming: Exploring the Influence of Alcohol on Cybersickness

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ABSTRACT
Recently released consumer head-mounted displays (HMD), such as the Oculus Rift, the HTC Vive, or the Sony PlayStation VR, hyped up the market of virtual reality, particularly affecting the gaming industry. Although the technology is now publicly accessible, it is not yet mature enough to guarantee its users an absolutely pleasant experience. Side effects of virtual environments, i.e. cybersickness, pose a threat to the safe use of the devices. Symptoms of cybersickness may worsen if safety instructions are neglected. It is not unlikely that home use of the headsets will entice consumers to combine virtual reality experiences with alcohol consumption.

This paper attempts to discover how alcohol intoxication affects the symptoms of cybersickness caused by immersion in virtual environment. Thirty-one participants were asked to play a video game using the Oculus Rift DK2 headset two times, before and after consuming either alcohol or a placebo.

The study revealed unexpected results: alcohol intoxication at a blood alcohol level of approximately 0.07% significantly reduced symptoms of cybersickness among individuals in the experimental treatment group and did not worsen symptoms among all participants.

ACM Classification Keywords
H.5.1 Information Interfaces and Presentation (e.g. HCI): Artificial, augmented, and virtual realities; H.1.2 User/Machine Systems: Human factors; K.8 Personal Computing: Games

Author Keywords
Virtual reality; cybersickness; alcohol intoxication; games

INTRODUCTION
In recent times, virtual reality (VR) technology has developed to a considerable extent. The progress is driven especially by the video game industry where intensive competition requires constant innovation in terms of realistic design, natural interaction, and improved usability. Substantial increase in the quality and capabilities of the modern virtual reality devices has led to a price decline for the technology, making it available to a wide range of customers.

The *Oculus Rift CV1*, currently among the most advanced VR headsets available to mass consumers, was released in the first quarter of 2016 for the US market and immediately followed by competitors such as the HTC Vive and Sony PlayStation VR. Today, developers offer hundreds of virtual reality games for home entertainment. Promising and captivating, however, the new technology is not yet mature enough to offer its users an entirely pleasant experience.

Interaction within a virtual environment (VE) may cause adverse effects influencing the level of comfort, safety, and health. Depending on the particular factor, side effects can be divided into direct and indirect ones [49]. Direct effects include traumatizing consequences of virtual reality systems on visual (e.g. photic seizures) and auditory systems (e.g. can cause hearing damages) as well as skin and tissue (e.g. bacteria). Indirect effects are presented by psychological effects (e.g. phobias, anxiety), neurological effects on the visual system (e.g. eyestrain), impairments caused in the vestibular system, and motion-sickness symptoms [49]. The latter is often described as the polysymptomatic maladaptation syndrome that may occur during exposure to real or apparent motion or result from synthetic experiences, such as, for instance, simulators, virtual environments, or augmented reality [34]. The dedicated syndrome caused by immersion in a computer generated virtual environment is called cybersickness [35].

Cybersickness is one of the main adverse effects of virtual environments. It is characterized by a number of symptoms including nausea, eye strain, sweating, disorientation, fatigue, headache, and vomiting [9]. There are several theories trying to explain causes of cybersickness occurrence, such as a sensory conflict theory, poison theory, and postural instability theory. However, research is struggling to provide a reasonable explanation of the side effects [33].

Cybersickness may significantly impede commercial success of virtual reality head-mounted displays. More importantly, it constitutes a potential threat to its users. Symptoms of

CHI PLAY'17, October 15 – 18, 2017, Amsterdam, Netherlands

ACM ISBN 978-1-4503-4898-0/17/10... $15.00
https://doi.org/10.1145/3116595.3116618

Case Study:

- Work with humans
- They eat different food

→ Informed Consent

→ Screening:

→Allergies

→Intolerances

→Food preferences

→ Hygiene before and during

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Eating, Smelling, and Seeing: Investigating Multisensory Integration and (In)congruent Stimuli while Eating in VR

Florian Weidner, Jana E. Maier, Wolfgang Broll

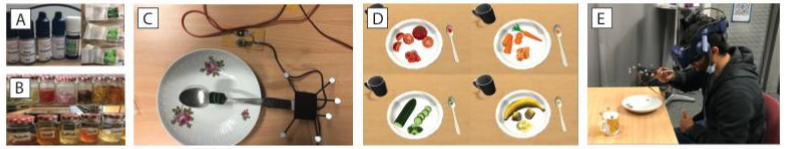

Fig. 1: Core components of the experiment with easy-to-reproduce and home-made smell samples (A & B), the low-cost Smell-O-Spoon that delivers gustatory and olfactory cues (C), the virtual products participants saw in VR (D) and a user experiencing our experiment (E).

Abstract— Integrating taste in AR/VR applications has various promising use cases — from social eating to the treatment of disorders. Despite many successful AR/VR applications that alter the taste of beverages and food, the relationship between olfaction, gustation, and vision during the process of multisensory integration (MSI) has not been fully explored yet. Thus, we present the results of a study in which participants were confronted with congruent and incongruent visual and olfactory stimuli while eating a tasteless food product in VR. We were interested (1) if participants integrate bi-modal congruent stimuli and (2) if vision guides MSI during congruent/incongruent conditions. Our results contain three main findings: First, and surprisingly, participants were not always able to detect congruent visual-olfactory stimuli when eating a portion of tasteless food. Second, when confronted with tri-modal incongruent cues, a majority of participants did not rely on any of the presented cues when forced to identify what they eat; this includes vision which has previously been shown to dominate MSI. Third, although research has shown that basic taste qualities like sweetness, saltiness, or sourness can be influenced by congruent cues, doing so with more complex flavors (e.g., zucchini or carrot) proved to be harder to achieve. We discuss our results in the context of multimodal integration, and within the domain of multisensory AR/VR. Our results are a necessary building block for future human-food interaction in XR that relies on smell, taste, and vision and are foundational for applied applications such as affective AR/VR.

Index Terms—Virtual reality, gustatory interfaces, olfactory interfaces, multisensory interfaces

1 Introduction

Multisensory integration (MSI) is the process that combines the information delivered by the sensory systems into a single percept. This influences our behavior and experiences [53]. In general, MSI is more straightforward when the sensory systems deliver stimuli that match with respect to their identity or meaning. This is called *semantic congruency* [50].

Relying on MSI, it has been shown that augmented reality (AR) and virtual reality (VR) can be used to manipulate the perceived taste of food and beverages by displaying congruent olfactory and visual stimuli (c.f. Sect. 2). Including such olfactory but also additional gustatory stimuli in AR/VR and non-immersive applications has shown potential in, for example, treatment of obesity and eating disorders [37], psychiatric conditions [44], in consumer behavior research [62], for the sense of presence in VR [21, 64], in learning environments [23], when sharing emotions via smell and taste [41], or when enhancing affective qualities of applications [40].

Despite these benefits and the eagerness of prior research to investigate if perception can be manipulated altogether, it is not sufficiently explored how olfaction, vision, and gustation interact and influence MSI. For example, it has been shown that the perception of sweetness (e.g., Narumi et al. [33]) can be altered by additional congruent cues. However, it is unclear how vision, olfaction, and gustation interplay and influence MSI when trying to change perception beyond the basic tastes of salty, sweet, bitter, sour, and umami. Further, while it has been shown that vision dominates when participants are confronted with competing visual and olfactory cues [29, 57], it is unclear how a third stimulus — in our case, a tasteless food product — impacts MSI. Thus, our objective is to further expand the understanding of MSI in multisensory AR/VR applications by investigating the following research questions:

RQ1: Do participants integrate *congruent* visual and olfactory stimuli into a single percept while eating a tasteless food?

RQ2: Are participants guided by their vision when forced to identify what they consume during visual-olfactory-gustatory *incongruency*?

To do this, we report on two pre-studies that we performed to find a tasteless and odorless grocery and suitable odor samples. Based on these results, we report on our main study and its three experiments where participants experienced and rated pictures, odors, and a multisensory VR environment. Our core contributions can be summarized as follows:

- We present food and smell samples that can easily be reproduced and do not rely on expensive equipment.

• *Florian Weidner (florian.weidner@tu-ilmenau.de, Gerd Boettcher (gerd.boettcher@tu-ilmenau.de), Jana E. Maier (jana.maier@tu-ilmenau.de), and Wolfgang Broll (wolfgang.broll@tu-ilmenau.de are) with the Virtual Worlds and Digital Games Group, Technische Universität Ilmenau, Germany.*

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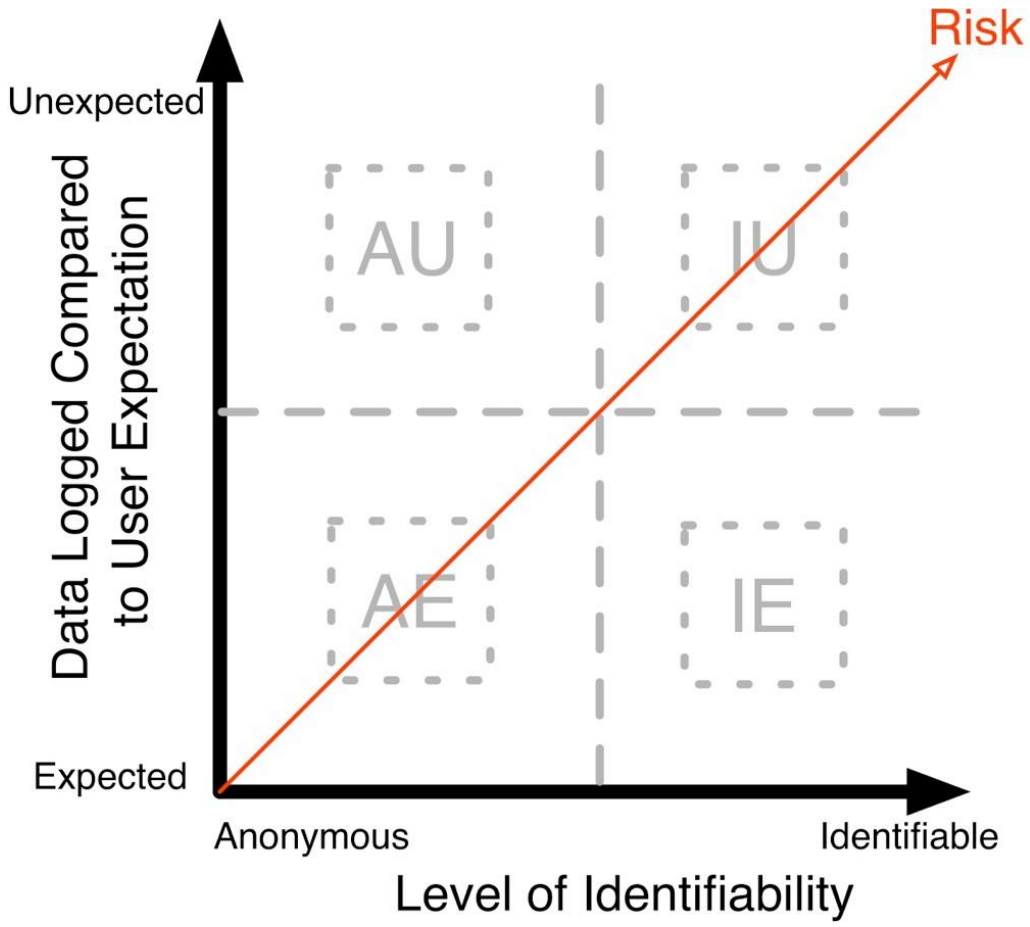
Big issue? Data. Privacy.

Categorised Ethical Framework

- So many different forms of research
  → hard to make ‘one size fits all’ set of guidelines
- Identified 2 main dimensions of participant ‘risk’
  - Anonymous vs identifiable
  - User expectation of app’s data access
- Categorize existing trials on this framework

For reference: https://dl.acm.org/doi/10.1145/2470654.2466245

Categorised Ethical Framework

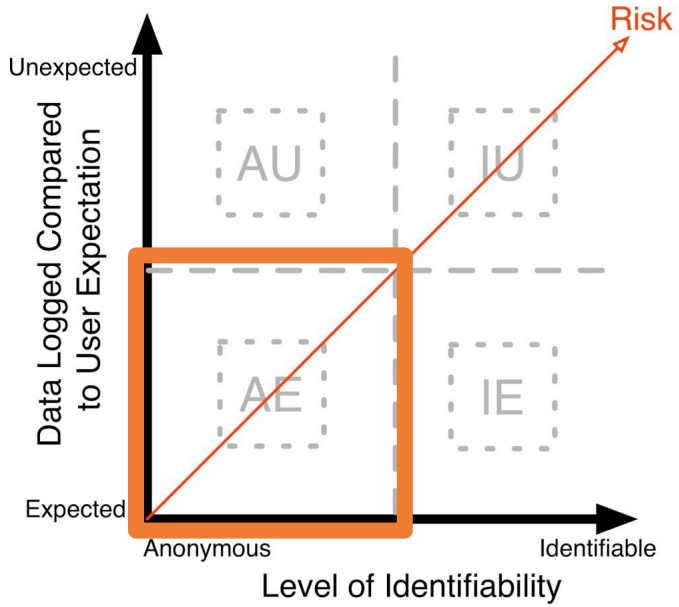


4 Quadrants:

- **AE**: Anonymous, Expected
- **AU**: Unexpected, anonymous
- **IE**: Identifiable, expected
- **IU**: Identifiable, unexpected

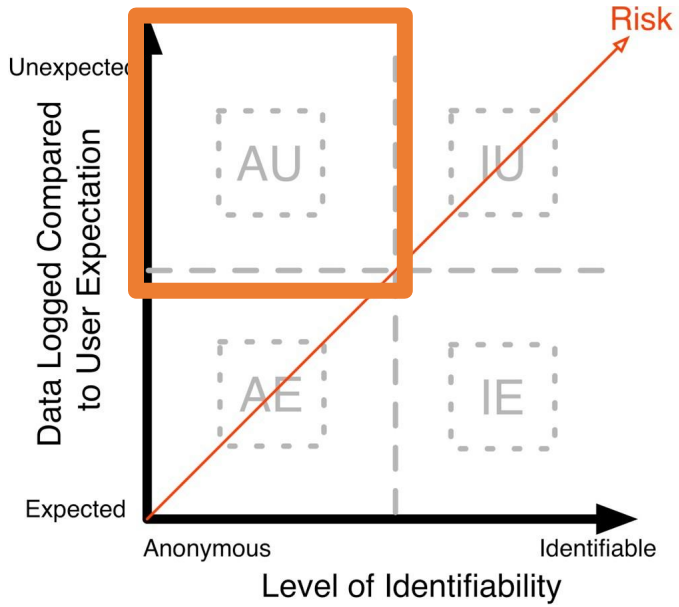
Anonymous, Expected

- e.g., Aggregate download/usage stats
- e.g., Logging data that is integral to app usage, but cannot be used to identify user
- Generally low risk
- Advice:
  - General guidelines sufficient
  - Terms & Conditions pages to explain research, etc.



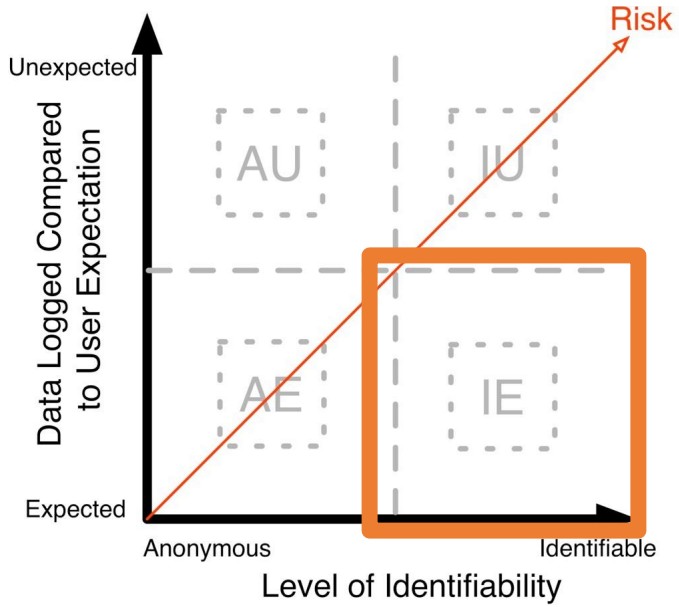
Anonymous, Unexpected

- e.g., a game looking at ‘unnecessary’ data: how many contacts you have, contents of media library...
- Advice
  - Pop-ups to gain explicit consent for each new data type captured
  - Mobile OSs now incorporate this



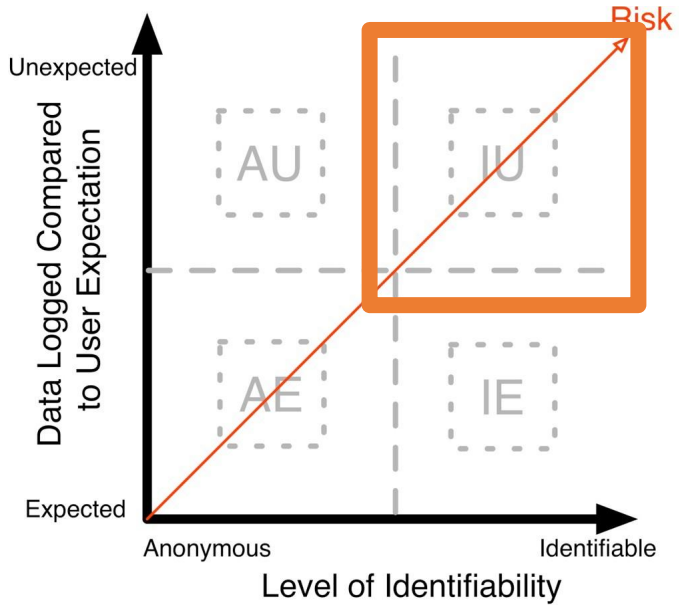
Identifiable, Expected

- e.g., location sharing apps, social media apps
- Advice
  - Provide functionality to browse data and delete specific parts
  - Effectively allowing ‘opt out’ at any time



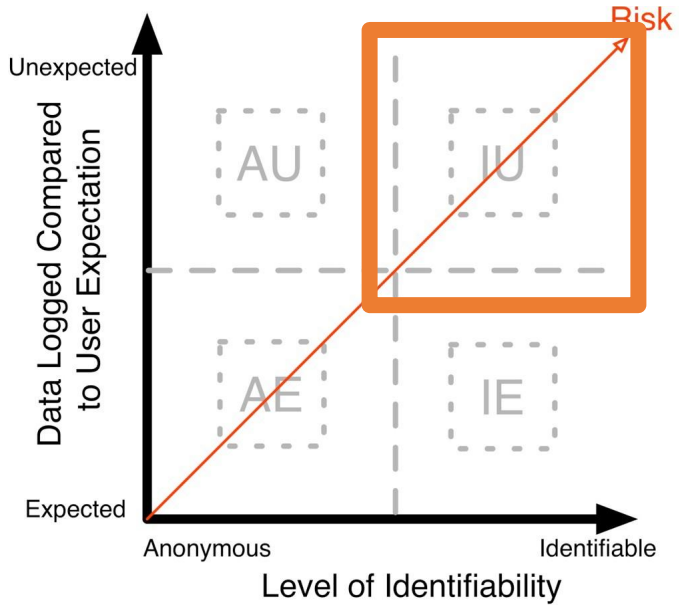
Identifiable, Unexpected

- e.g., a game looking at ‘unnecessary’ data that could identify a user: location
- Highest risk
- Advice
  - Actively interrupt users
  - Show them examples of recorded data
  - !



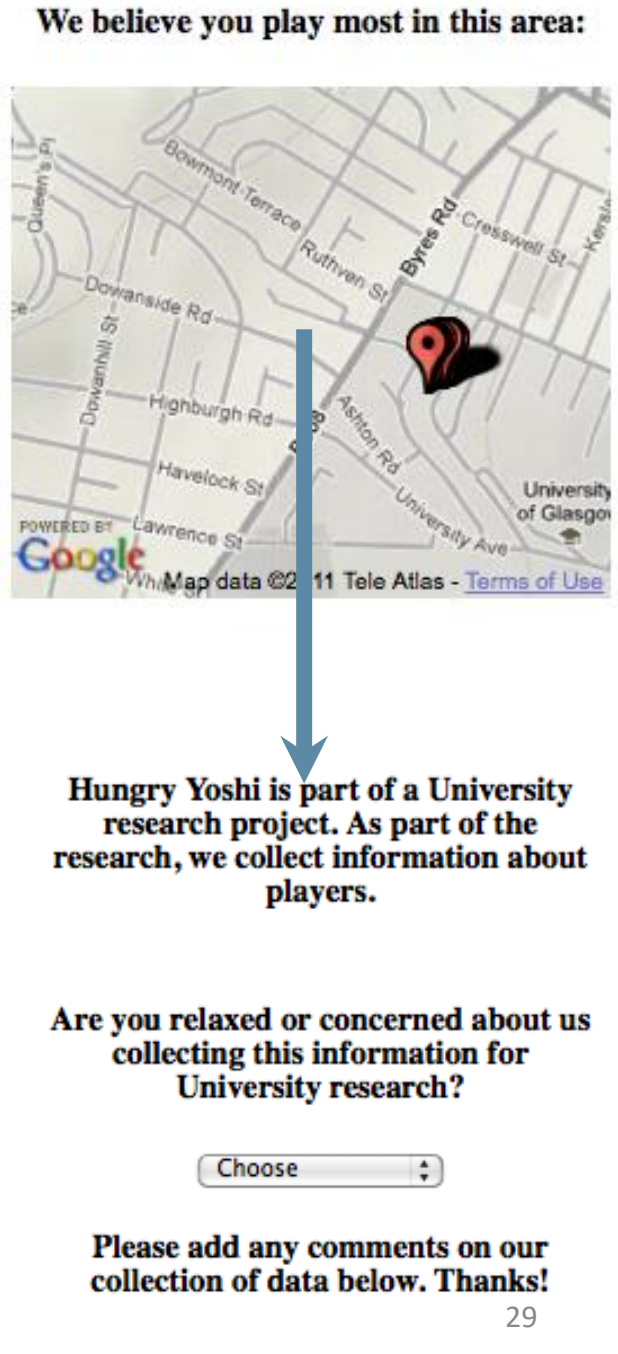
Identifiable, Unexpected: Interruption

- T&C read rates suggest we need to find a better alternative to T&Cs
- Alternative idea, based on interruption
  - Visual representation of log data
  - Delayed presentation of information
  - Personalized with user's own data



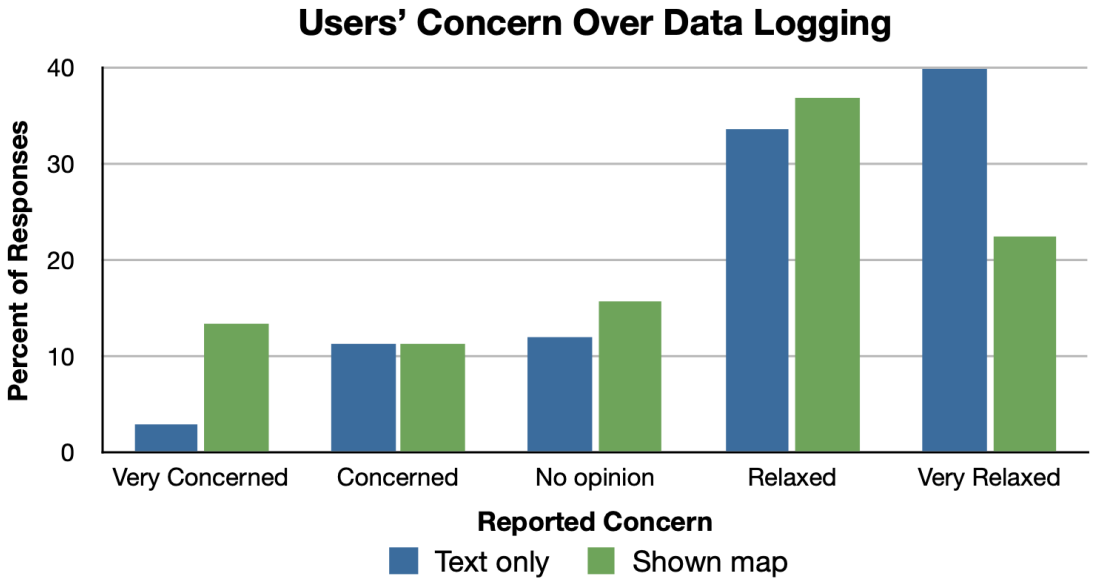
Example: Interruption User Study

- Hungry Yoshi
- 1007 users; between-groups design
- Hash function on the device's unique ID to randomly assign to a condition



For reference: https://dl.acm.org/doi/10.1145/2639189.2639239

Concern Following Interruption



Mann-Whitney U test: significant difference between conditions ($p<0.01$)

Discussion

- Can be extended to many forms of data
- Collect data only locally on device for a short period at start
- Interrupt user with visual depiction of her own data
  - If they agree to participate, upload collected data, keep logging
  - If they disagree, destroy collected data without it ever leaving the device
- Should be more engagement of users generally
  - Ethics as active area of research
  - Not just box to tick

Various Users

Different types of users

- Children
- Older Adults
- Learning and Cognitive Disabilities
- Physical Limitations
- Accessibility Needs
- Animals
- Plants/ Non-Human Objects?

Child-Computer Interaction (CCI)

- Children have been users of technology for the last two decades: 42% of children in the UK own a tablet between 5-7 (Burns & Gottschalk, 2019)
- As children increasingly become users, we need to understand better how research methods in Human-Computer Interaction can be adapted to address children →Child-Computer Interaction (CCI)
- CCI focuses on how to develop new methods to design and evaluate how children interact with novel technologies
- Children counted as a vulnerable group

Challenges in CCI

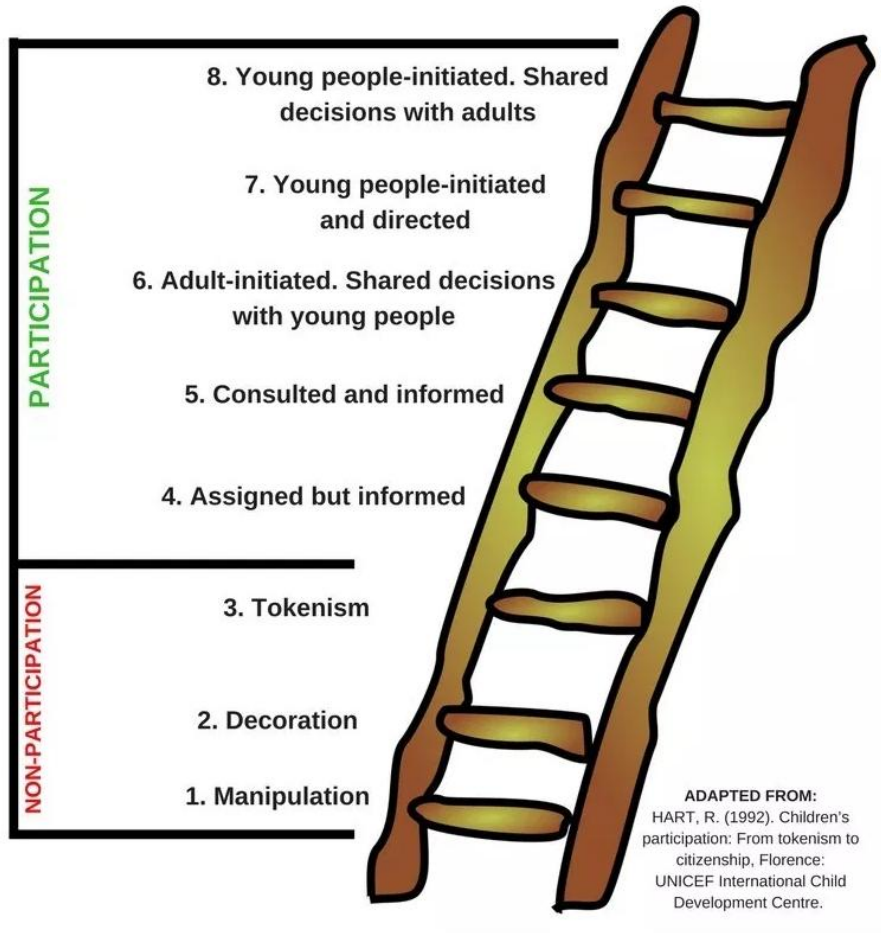
- Consent is different
  → Often through parents/caregivers
- Children's understanding of the world is different
  → Understanding of computers different
- Power dynamics (parent/caregiver)
- Children's roles in life are different
- Attention to task is different

Methods in CCI

- User observation (watching play)
- Semi-structured interviews
- Self-developed questionnaires or standardized questionaries
- Creative sessions/ workshops
- Activity Logging
- User testing
- Diary keeping
- Focus Group
- Cooperative Inquiry (e.g., kid reporter technique), bags of stuff, sticky noting
- Free Interviews
- Brainstorming
- Physiological measurements (e.g., eye tracking, emotion tracking)
- Probes
- Card sorting
- Robots

Methods in CCI

- 67% of researchers use multiple methods
- These methods can be classified as passive or active
  - User, Tester, Informant, Design Partner
  - Builds on Hart's Ladder of Participation (UN initiative)
- Researchers stress to involve children in the design of things they use
- It isn't easy to involve diverse children →Important not to over burden



For Reference: https://www.sciencedirect.com/science/article/pii/S2212868921000908

Example: Surveys with Children

- Important that users can voice opinion on technology that they use
- But – children have different language ability, reading age, and motor skills as well as confidence, self-belief and the desire to please.
- Fun toolkit https://dl.acm.org/doi/10.1145/1139073.1139096

Again, again Method examples

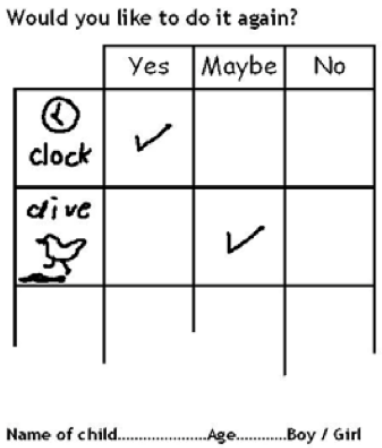


Figure 4 - A Completed Again - Again table

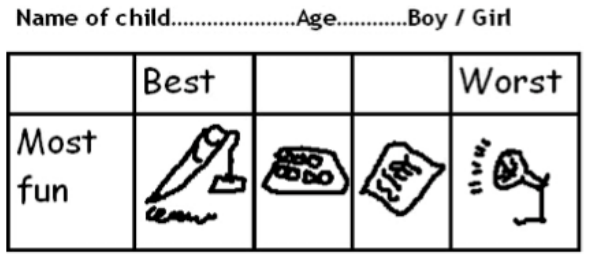


Figure 3 - A Completed Fun Sorter

Older Adults

- Unique challenges in designing technologies for and with older adults
- Older adults more likely to experience accessibility-related challenges
- Characteristics of life stage, history of learning, using different technologies, generational perspectives and social context all affect their technology usage
- How to you create a concept of older people
  1. Individuals in need of help due to age-related decline
  2. Individuals that make contributions to families and society despite their age
  3. ?

For reference: https://doi.org/10.1145/3290607.3299025

Older Adults Challenges

1. Individuals in need of help:
   - Technologies to compensate for “downsides of aging”
   - Help in a wide range of daily living independently
2. Individuals that contribute:
   - Supporting social relationships, creativity, and personal interests in relation to age-related decline in functional capabilities

- Older people, however, are not a well-defined category of users
- Growing movement towards participatory approach
  → partners, nut just users.

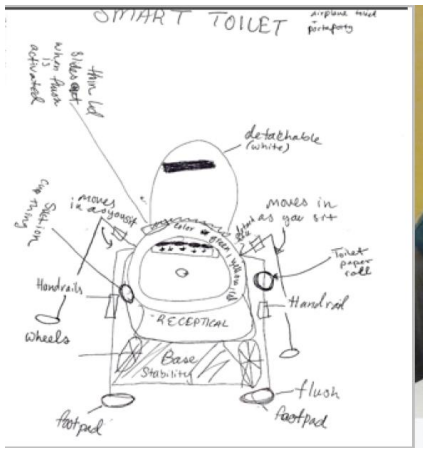
For reference: https://www.sciencedirect.com/science/article/pii/S107158191730099X

Older Adults Recommendations

- Older adults as individual; do not always need own category
  - Older people are often part of the same ecosystem within the population
  - Avoids “othering”
- Try to use a more situating lens e.g., ethnography:
  → Often, advice is not to recruit; go into their everyday life
- Recognize older people's needs as context-dependent
- Think across ages
- Employ user-centered design approaches

For reference: https://www.sciencedirect.com/science/article/pii/S107158191730099X

Example: Older Adults



- Co-design with 16 older adults (55- 85+)
- 12 co-design sessions
- Designed technologies for child (student)-adult relationships
- Found forming partnerships is complex
- Found students often made assumptions and co-design provides more meaningful experiences

For reference: https://doi.org/10.1145/33362

Disabilities

If you had to place a bet, would you say personal computing has made life better or worse for people living with disabilities?

Disabilities

- We have no way of knowing the answer to this question, it's too big and there are a lot of confounding variables
- And what even is "computing"…
- There are many, many specific benefits:
  - Telemedicine lets you connect with healthcare workers remotely
  - New monitoring technologies
  - Biometric sensors to better understand healthcare challenges
  - Insights into New Drug Creation
  - New ways to connect with others when you can't easily leave home
- But?

Disabilities: Not everyone is on equal

- But, if you think that the answer is obvious, you probably need to think again – “The digital divide” or “digital exclusion” is the gap in opportunities that has emerged between people with easy access to modern computing and people without
- On the wrong side:
  - People in rural communities,
  - older people,
  - less educated people, and
  - people living with long-term health problems
- Banking, job searches, study opportunities, taxes, etc. are all far harder if you are anything other than digitally fluent

Deeper Problems

- Telemedicine?
  - Healthcare worker might be only outside contact.
- New monitoring technologies
  - What if you don’t like being monitored in your home 24/7?
- Biometric sensors to better understand healthcare challenges
  - Have surprisingly few benefits...
- Insights into new drug creation with large computational networks
  - Are great so long as you can access the drugs
- New ways to connect with others when you can’t easily leave home
  - Comes with diminished quality of connection built right in

Why do we get it wrong?

- The User-centred principle (UCD) says that the most important person to consider when designing a new product is the person who will actually use it. This seems intuitively obvious, but it often doesn't happen in the real world because....

→We don't know what they think until we give them the product

→ The user doesn't usually pay for the design of the product so has little influence over the design process

→We can make the mistake of thinking that we are the end user

UCD and Disability?

- Patients are a long way from the design process which typically starts with businesses or hospital groups observing problems or maybe healthcare professionals...
- Our intuition when dealing with long-term health problems is bad - we (designers) often live very different lives to people with long-term health problems
- Lots of people living with disabilities are also older people – a double whammy (as we just spoke about) in terms of experience-gap for young professionals in the design industry

What can we do?

- Accessibility → most basic of approach
- A range of heuristics that can be used to build interfaces and websites that are **usable** for people living with a range of different disabilities
- The Nielsen Group and W3C both have comprehensive guides to making accessible digital tech
  - Color schemes, font sizes, text controls, alt-text, menu layout, button sizes and rendering on-screen, image choice, …
- But we tend only to mean usable when we say accessible – there are many examples of tech that is **usable but not useful**

What can we do about poor design?

Advanced: User-Sensitive Inclusive Design for Dynamic Diversity

- User Sensitive – use design practices that include people unlike you
- Inclusive Design – design for a multitude of abilities/disabilities
- Dynamic Diversity – health challenges aren't fixed in place
- Diversity – the population living with health problems is MORE diverse than the population living without health problems
  - Older adults are a more diverse group than younger adults
  - the richest are richer, the poorest are poorer,
  - the healthiest are healthier,
  - the most challenged face more challenges, etc

For reference: https://link.springer.com/article/10.1007/s10209-010-0203-y

Questions?
Comments?
Concerns?

User Interaction Topics

- ✅ HCI History and Introduction
- ✅ Usability and Heuristics
- ✅ Heuristic Evaluation and Human Cognition
- ✅ Human Perception and Capabilities
- ✅ Experimental Design & Variables Research
- ✅ Personas and Scenarios
- ✅ Surveys in HCI
- ✅ Ethnography
- ✅ Statistical Methods
- ✅ Theories in HCI & User-Centered Design
- ✅ Models of Interaction
- ✅ Large Scale and Mobile HCI
- ✅ Various Users and Ethics
- Revision & Quiz

jbq2ns

Any quiz questions?

Various Users: Todays Task

- ❑Using your teams survey you created in Session 7 (Surveys in HCI), change this survey to fit a child user.
- ❑The Fun Toolkit has some ideas and guidelines if you need them.
  - ❑Section 3 in https://link.springer.com/article/10.1007/s10111-007-0069-9
- ❑Have a think about what methods you would use (smilo-o-meter, again, again etc.), the wording and why you would implement these questions.
- ❑Post a copy of your survey on Teams.

[30 mins]