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### Research methods from the social sciences in human computer interaction

Vinson, Norman G.; Lapointe, Jean-François; Kondratova, Irina

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# Research Methods from the Social Sciences in Human Computer Interaction

Norman G. Vinson,  
Jean-François Lapointe  
Irina Kondratova

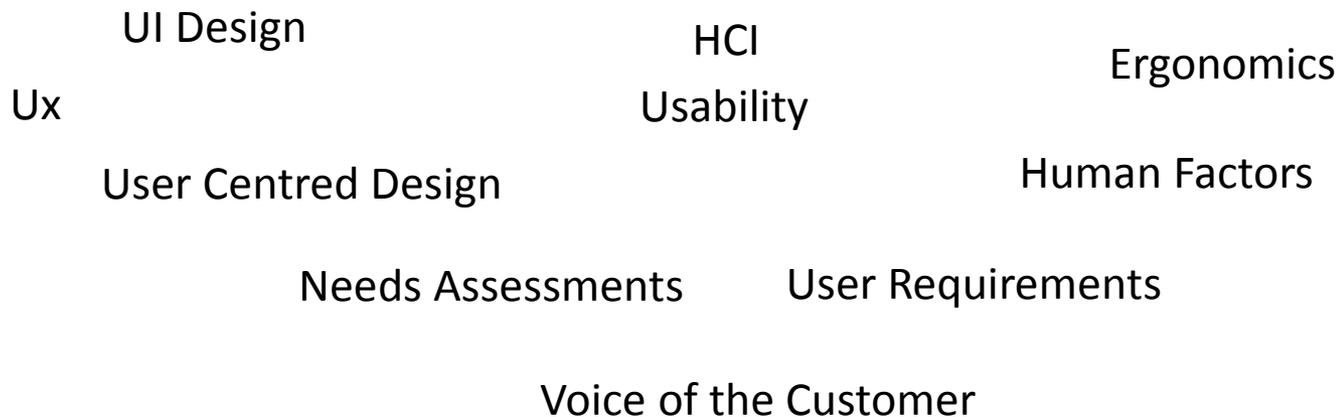


# Outline

- Human Computer Interaction (HCI)
  - HCI, Ux, Usability, Human Factors, etc
- Methods
  - Field Methods
    - Ethnographic Methods
    - Interviews
    - Field Tests
    - Ethical Issues
  - Questionnaires & Surveys
  - Lab Experiments
- Relationships between methods

# Human Computer Interaction (HCI) vs Usability

- Substantial overlap
- Effective efficient and satisfying use of computing technology
  - HCI = science -> general principles
  - Usability = practice -> specific product
  - NRC does both
- Many Related Terms



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# Ethnographic Methods

- Observation (Nardi, 1997)
- Uses
  - Typically more focussed than classic anthropology studies
  - Needs assessment
  - Observation & documentation of workflows/processes
  - Development of use cases
- Example:
  - Examination of software engineers' work practices (Singer et al 1997/2010)

# Interviews

- Often semi-structured
  - Specific questions, but open ended
- Responses coded as a function of topics of investigation
  - Summary statistics produced
  - Example
    - Interviews of nurses on medication distribution process (Sirois et al, 2013)
      - Frequency of missing doses
  - Useful for rare events that cannot be readily observed
    - Critical Incident Technique (Flanagan, 1954)

# Field Tests

- Test a technology in the field, in real world
  - Tech has to work
  - Testing a product (but depends)
  - Similar to usability testing
- Quantitative or qualitative
- Example:
  - Developed software running on small tablets (iPad-like) for users to support their learning
  - Tested with real students taking classes (Munteanu et al 2012)

# Field Methods: Ethical Issues

- Consent for Workplace Research
  - Consent from the organization
  - Consent from the employees
  - Undue Influence
  - Employee's work responsibilities (Vinson & Singer, 2004)
- Privacy & Confidentiality
  - Can employees be identified
  - Also a practical issue
- Difficult situations
  - Observing/recording behaviour that is not “by the book”
  - Safety violations
  - Theft

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# Questionnaires and Surveys

- To confirm & generalize observation/interview findings
- Usability testing
  - User satisfaction questionnaire
    - <https://www.usability.gov/how-to-and-tools/methods/online-surveys.html>
    - Developed a video player with video-manipulating features (e.g. looping segments) for musician self-observation (Emond et al 2007)
  - Technology Acceptance Model (Davis, 1989)
    - Validated
    - Predicts whether people will use a technology
      - Ease of use, usefulness, intention to use

# Questionnaires and Surveys

## › Ethical Issues

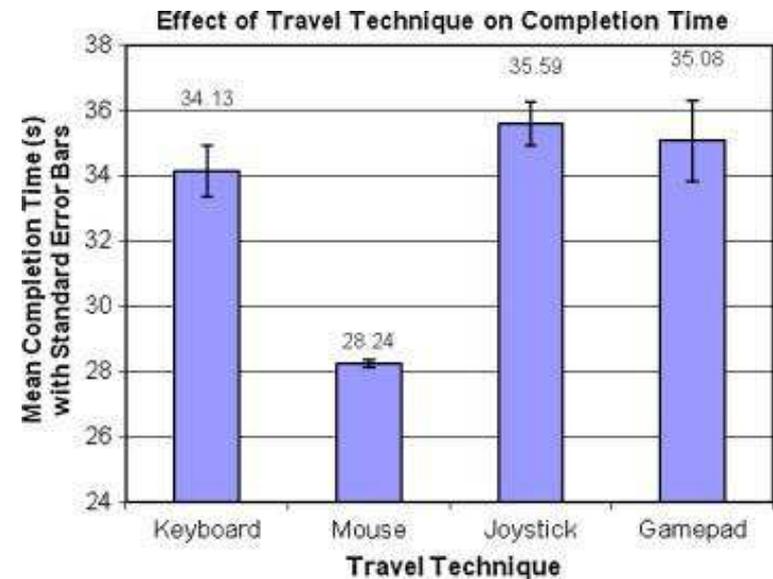
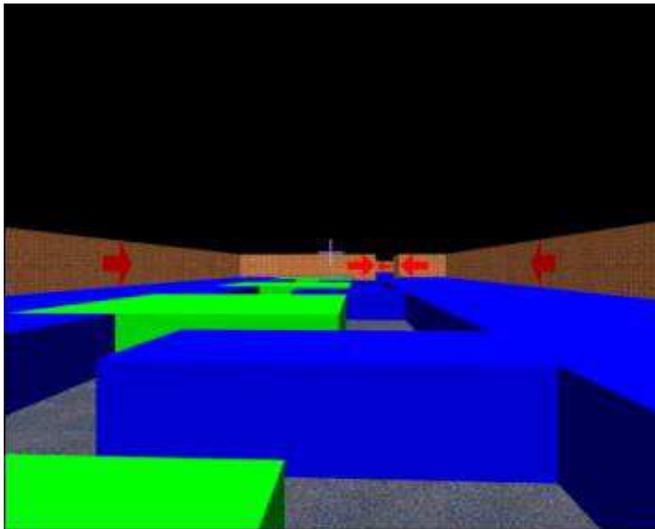
- Procedure not invasive
- Little contact with researchers
- Questions can pose a risk
  - Which of the following trigger your PTSD (please check all that apply)
  - On the following scale, rate your manager's competence

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# Lab Experiments

- › Scientific research lab experiments
- › Typically involve a comparison of behaviour under different conditions
- › Focus on very very specific questions
- › Example: navigation with different input devices
  - a keyboard, a mouse, a joystick and a gamepad



# Lab Experiments

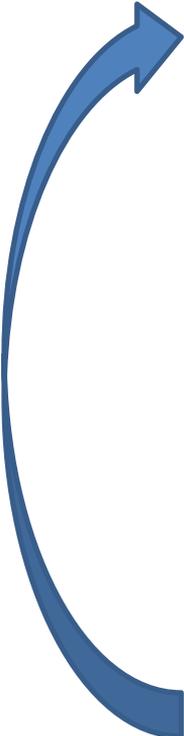
- › Usability Testing is usually a type of lab experiment
  - Observe users scripted task performance
    - Follow a scenario
  - Take note of difficulties
  - Example: Flu assessment website
  - Can include questionnaire/survey
- › Remote usability testing
  - › Usability testing as above, but over the internet
    - Scenario (loop11)
    - A/B testing
      - Compare website 1 to website 2
      - Measure behaviour
        - Like sales “conversions”

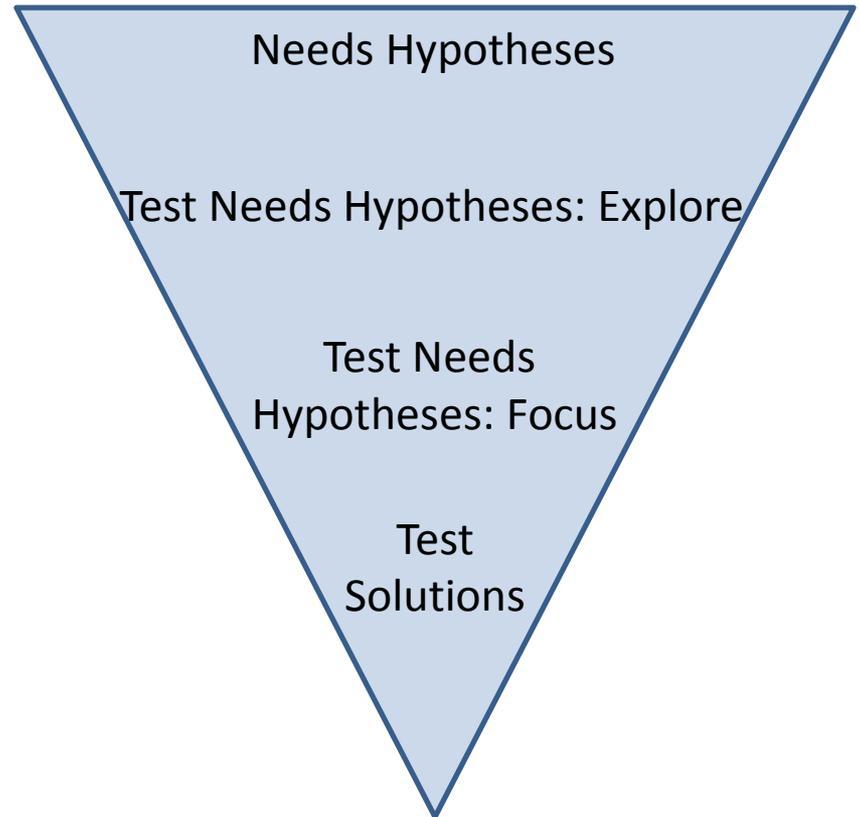
# Lab Experiments

## › Ethical Issues

- Typically very low risk in HCI
- Easy to follow consent procedures

# Relationships

- 
- Ethnographic Methods
  - Interviews
  - Questionnaires & Surveys
  - Lab Experiments
  - Field Tests



# Thank you

