Online Experiments in Psychology

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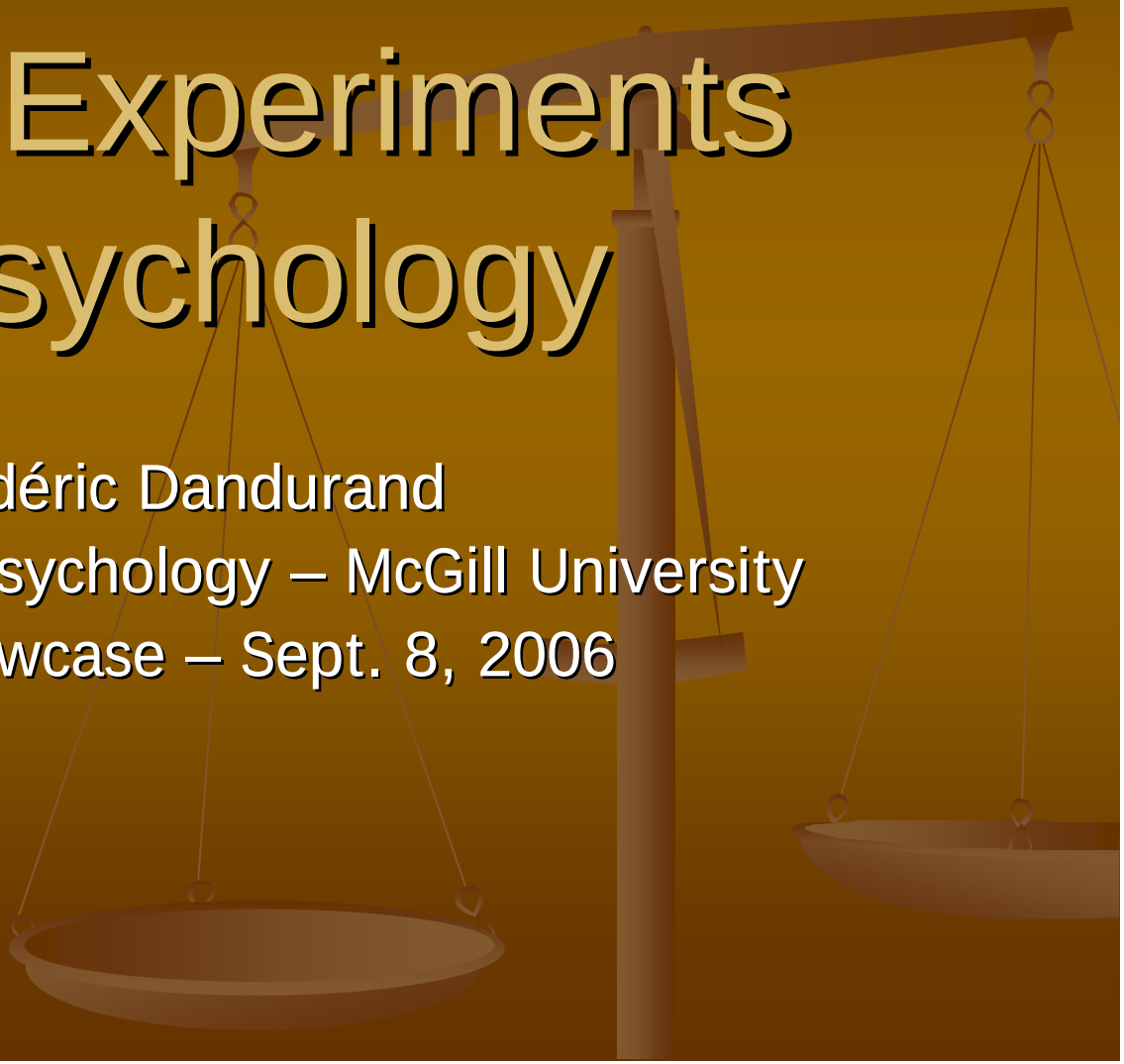


Use of the Web in Psychology

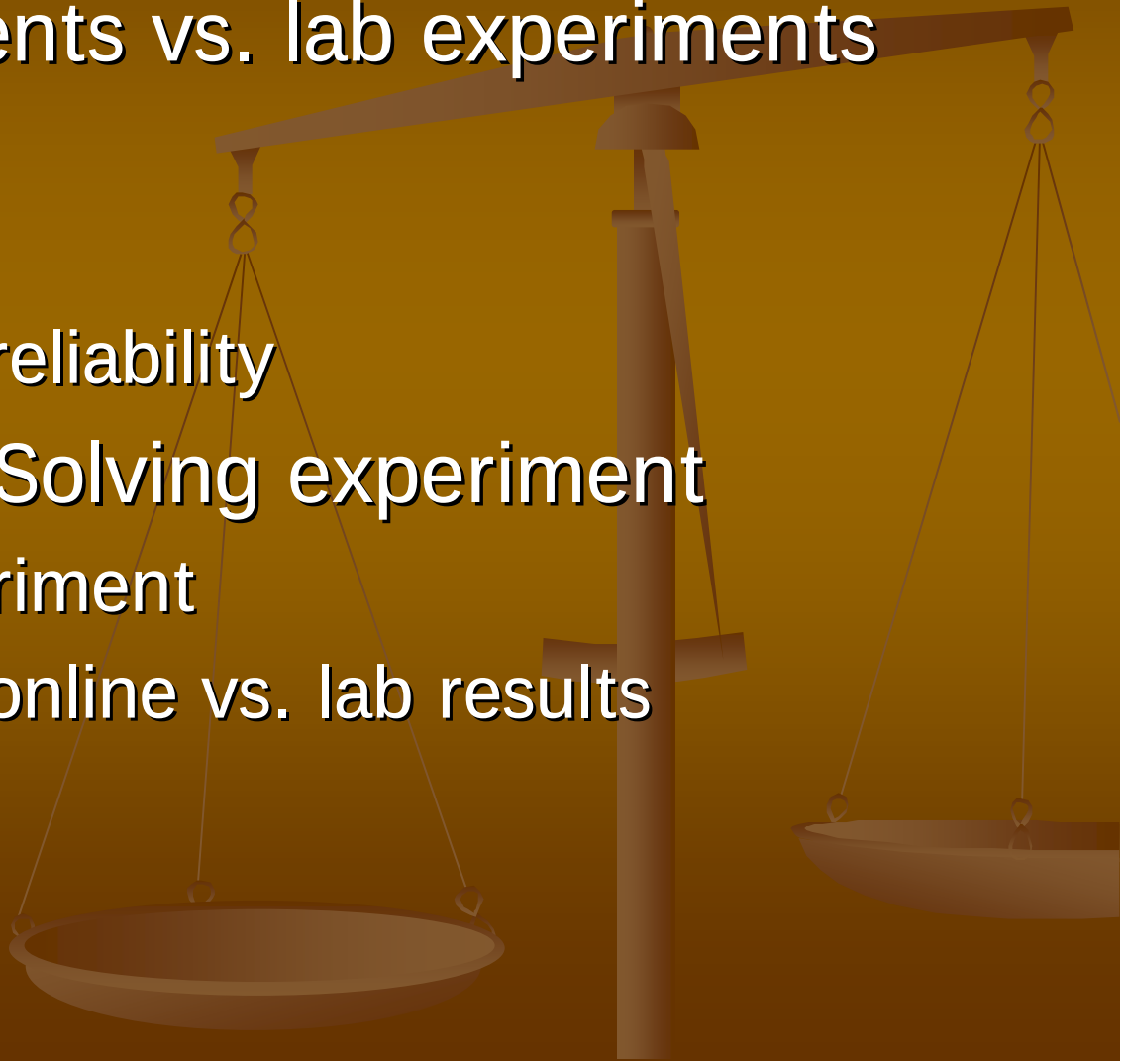
- Experimental
  - Dr. Ulf Reips – University of Zurich (Switzerland)

    Reips, U.-D. (2002). Standards for Internet-based experimenting. Experimental Psychology, 49 (4), 243-256.
- Clinical
  - E.g., Psychological testing and assessment

    (Jerome et al., 2000; Buchanan, 2002; Barak & Buchanan, 2004)

Agenda

- Online experiments vs. lab experiments
  - Pros
  - Cons
  - Comparison of reliability
- Gizmo Problem Solving experiment
  - About the experiment
  - Comparison of online vs. lab results
- Discussion



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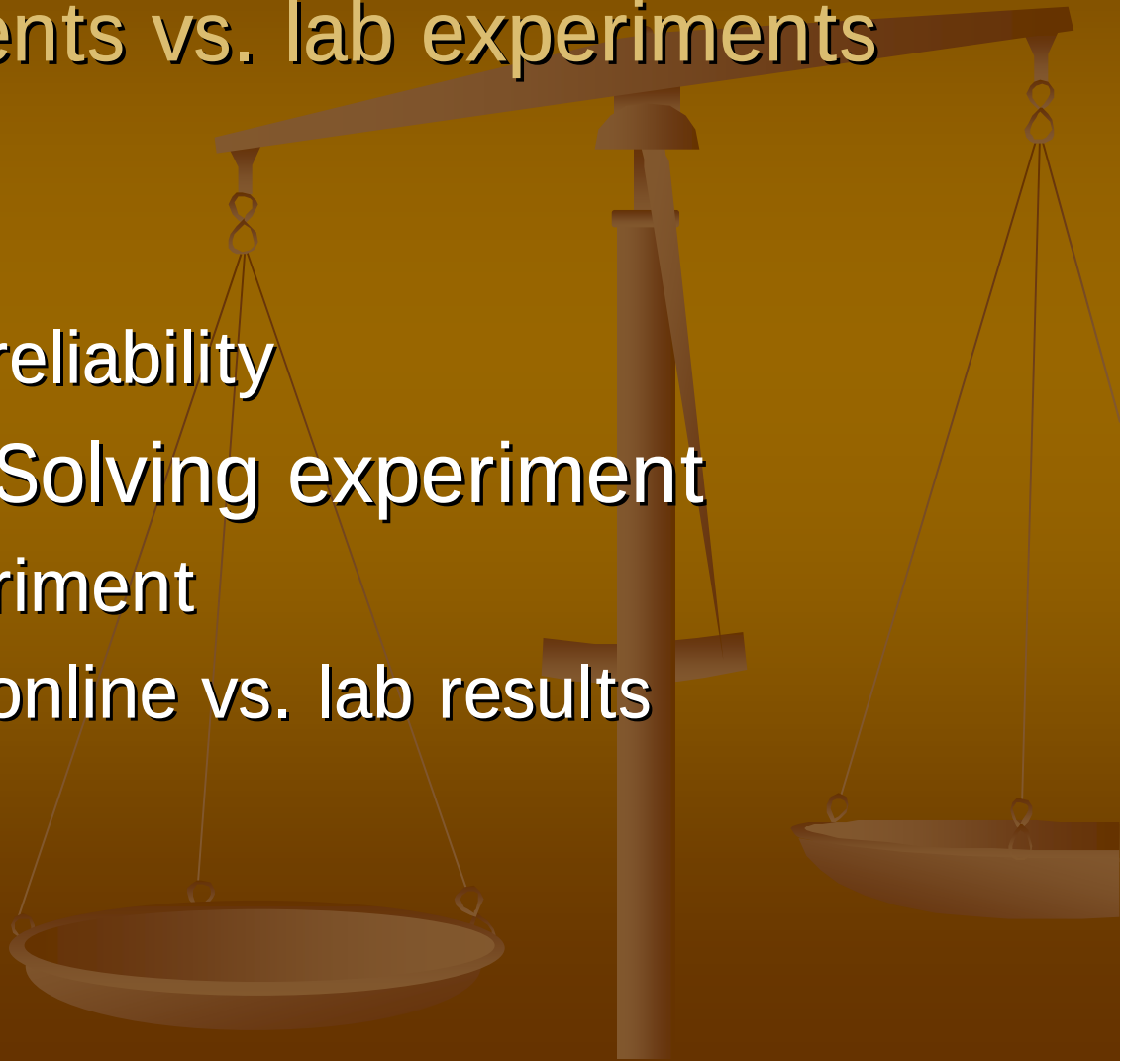
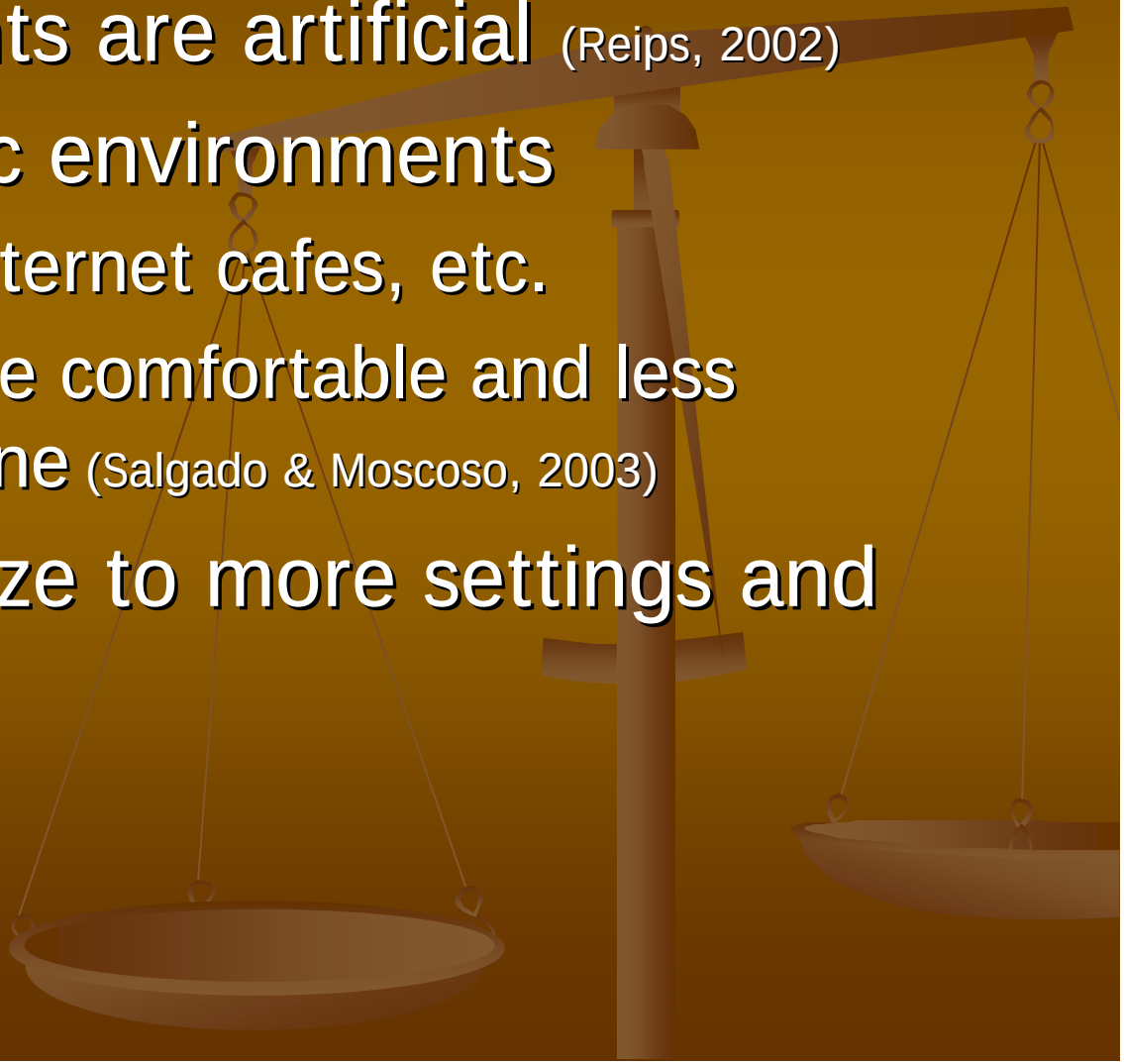


Pros (1): Population and Sample

- Not limited to local community
  (e.g., psychology undergraduate students)
- Wider access
- Better generalization

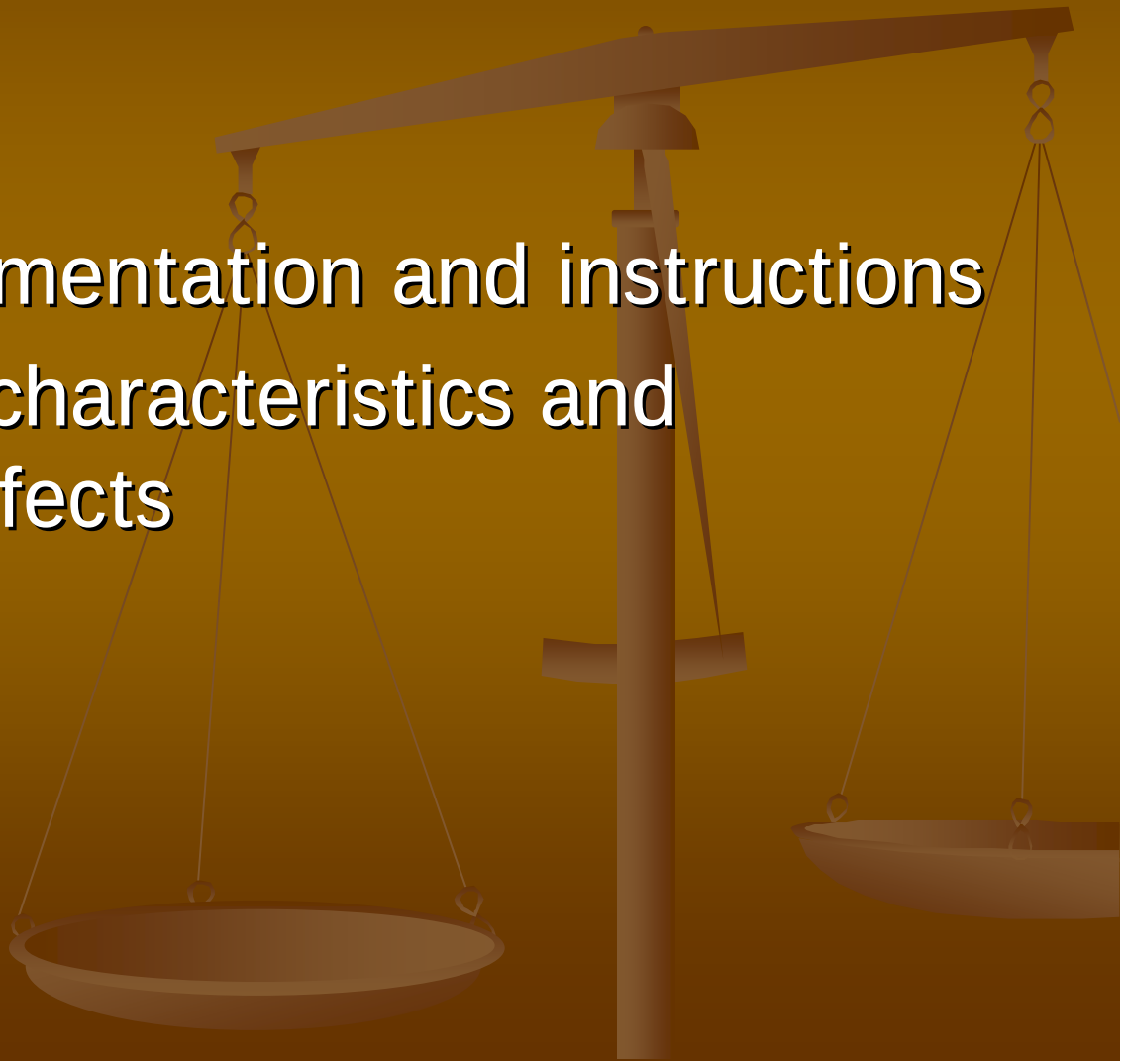
Pros (2): Experimental Settings

- Lab environments are artificial (Reips, 2002)
- More naturalistic environments
  - Home, work, Internet cafes, etc.
  - People feel more comfortable and less intimidated online (Salgado & Moscoso, 2003)
- Results generalize to more settings and situations



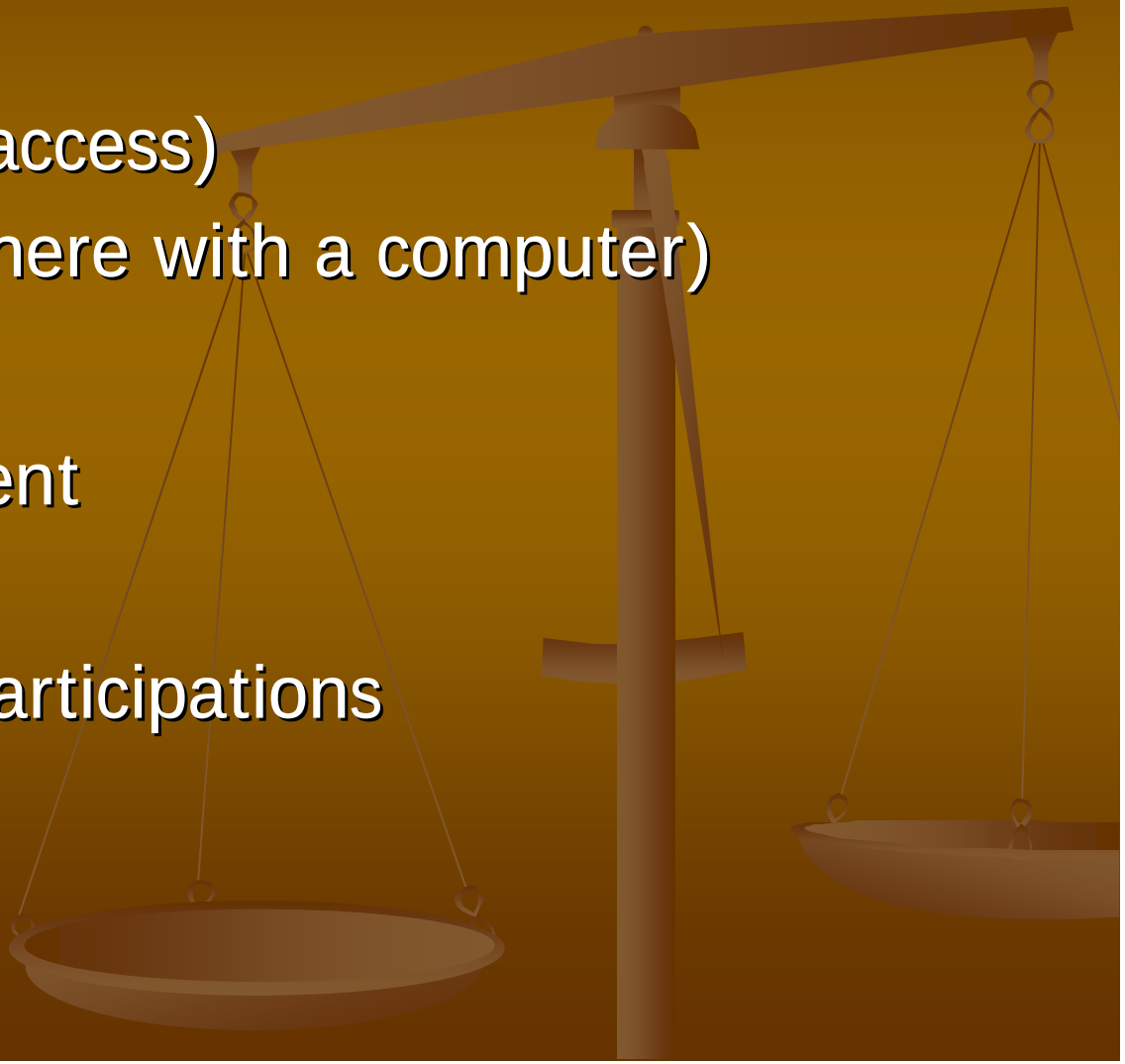
Pros (3): Automation

- Saves time
- Reduces cost
- Controlled documentation and instructions
- Fewer demand characteristics and experimenter effects



Pros (4): Reduced Constraints

- Easy access
  - Time (24-hour access)
  - Location (anywhere with a computer)
- Organization
  - Less management
  - Scheduling
  - Simultaneous participations



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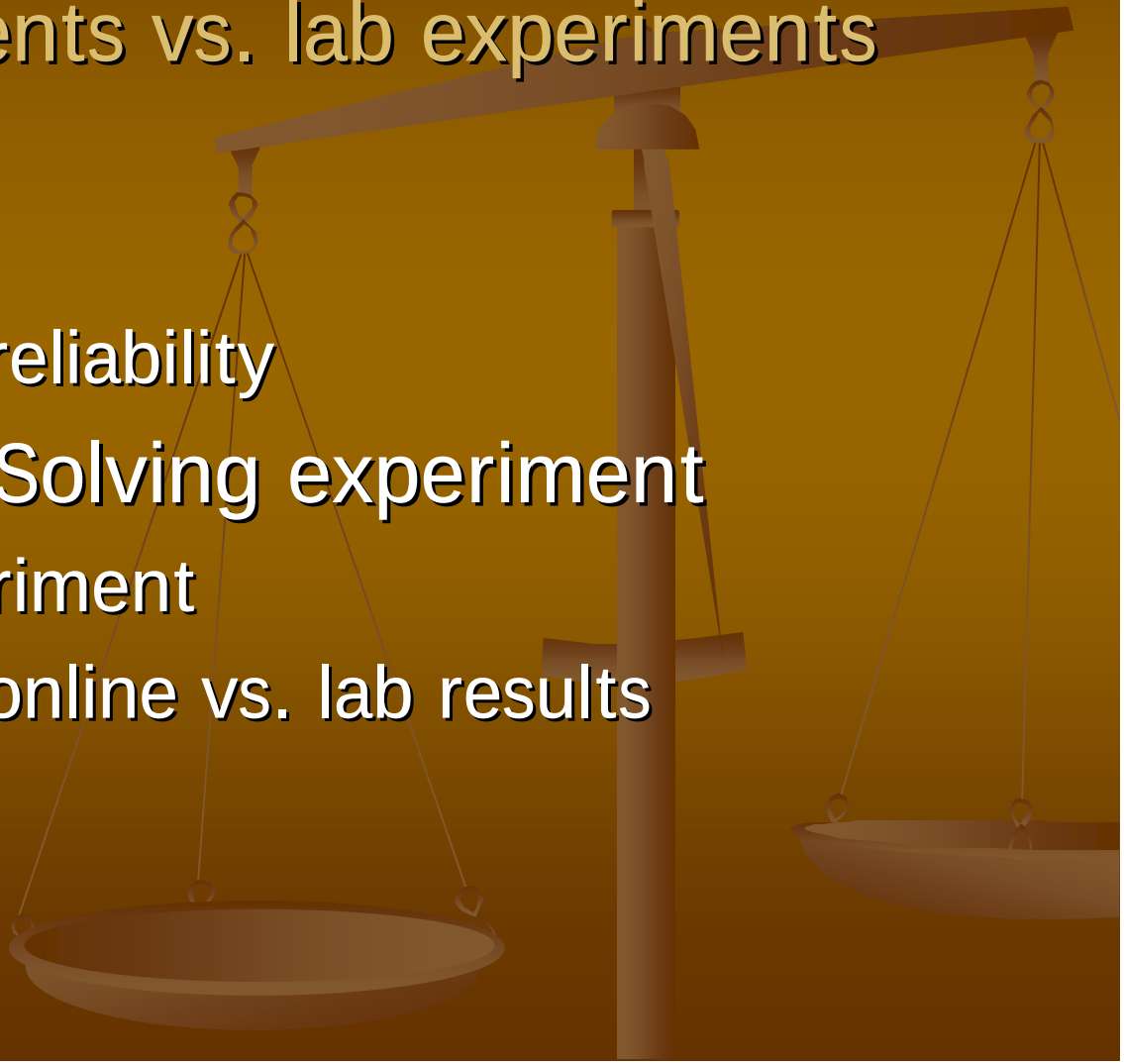
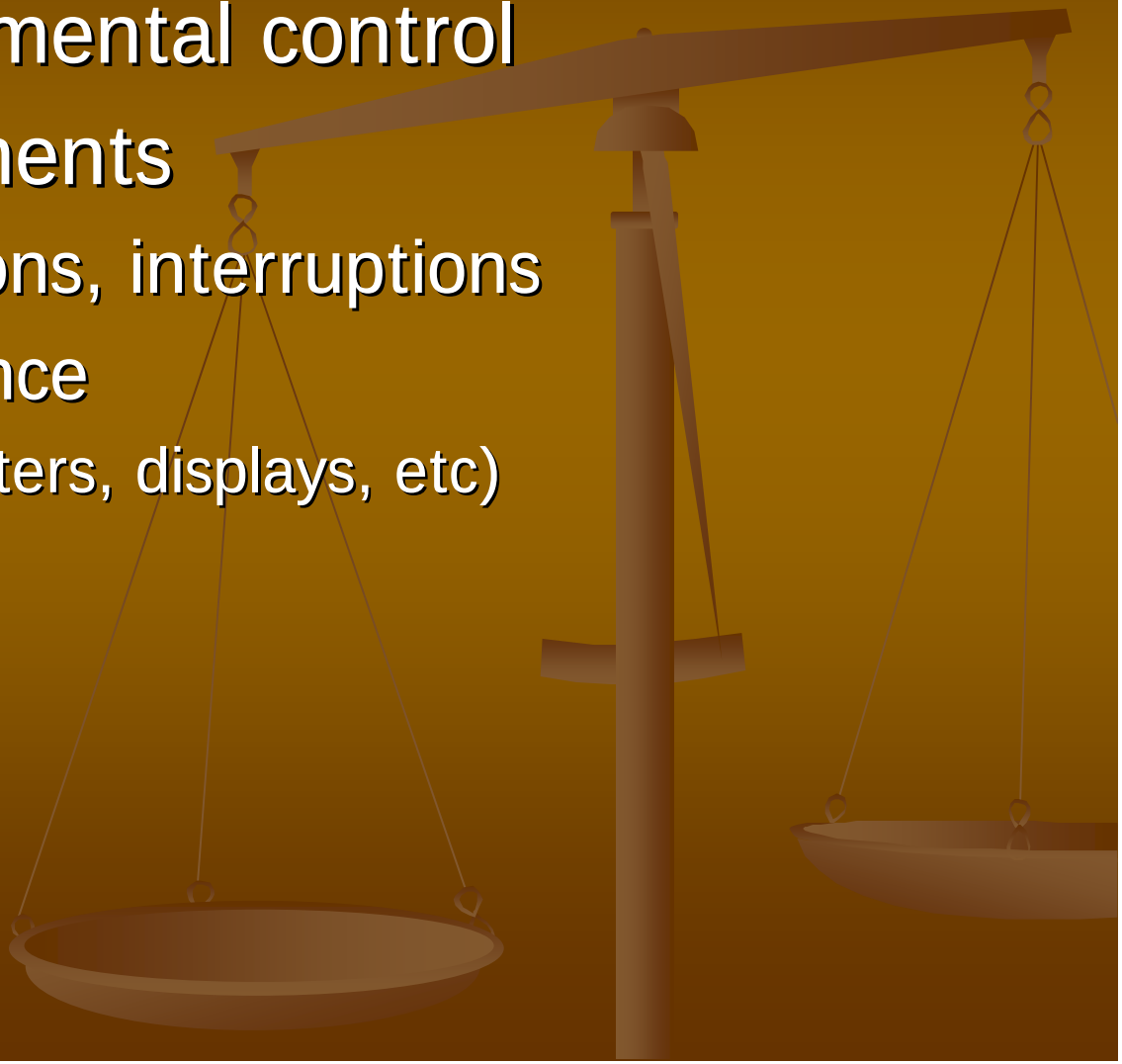


Cons (1): Reduced Control

- Reduced experimental control
- Varied environments
  - Noise, distractions, interruptions
  - Technical variance

    (different computers, displays, etc)
- More variance

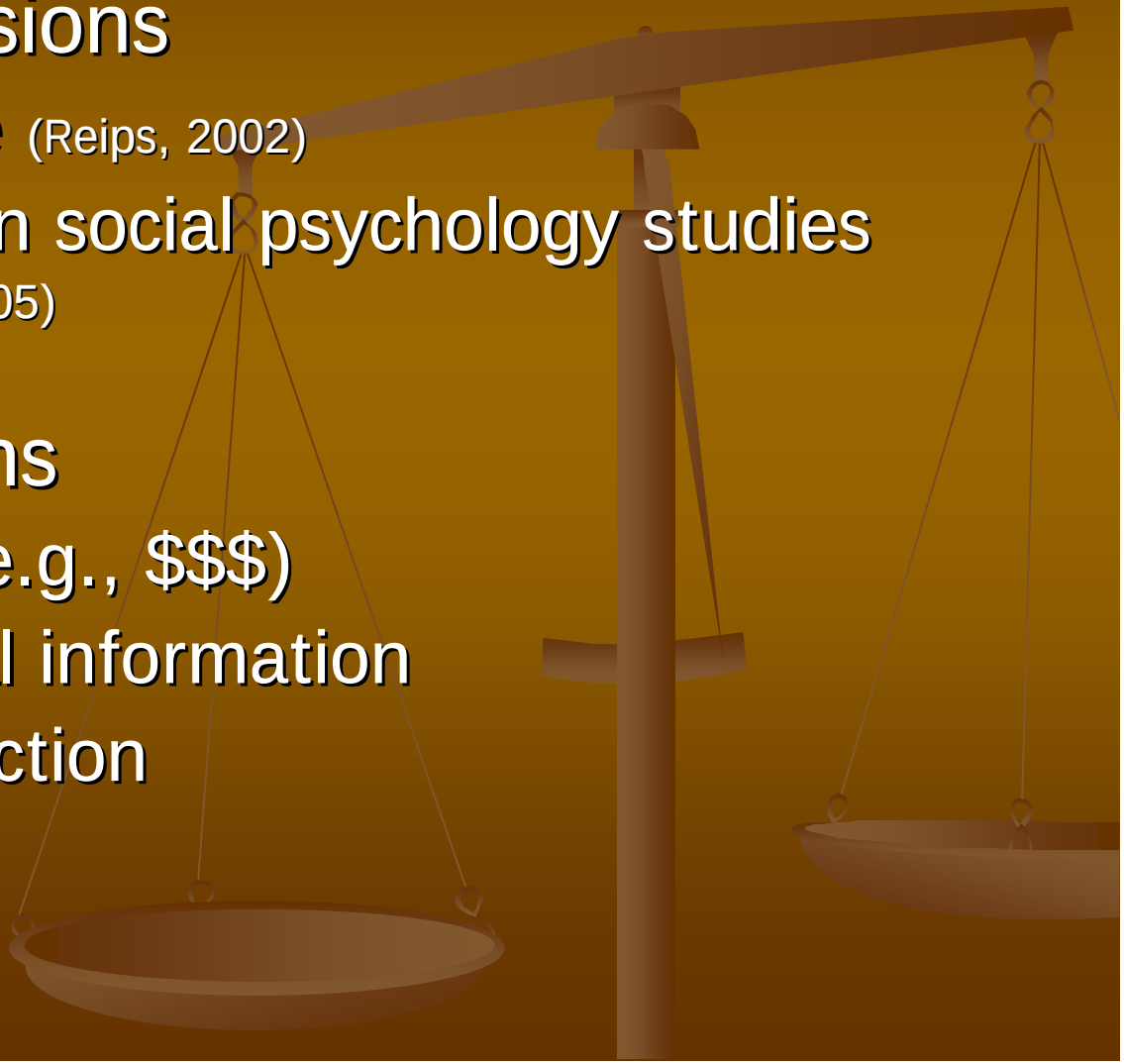


Cons (2): Dropout

- Dropout
  - Downside of highly voluntary participation
  - Attention span, motivation
  - Distractions, interruptions
- Possible solutions
  - Offer incentives
  - Clear instructions and user interface
  - Provide email address for asking questions
  - Force dropout early (Reips, 2002)

Cons (3): Multiple Submissions

- Multiple submissions
  - Cheating is rare (Reips, 2002)
  - More frequent in social psychology studies (e.g., Konstan et al, 2005)
- Possible solutions
  - No incentives (e.g., $$$)
  - Ask for personal information
  - Password protection



Online experiments: pros & cons

- Pros
  - Broader range of participants and settings
  - Automation
  - Flexibility
- Cons
  - Reduced control
  - Increased dropout
  - Multiple submissions

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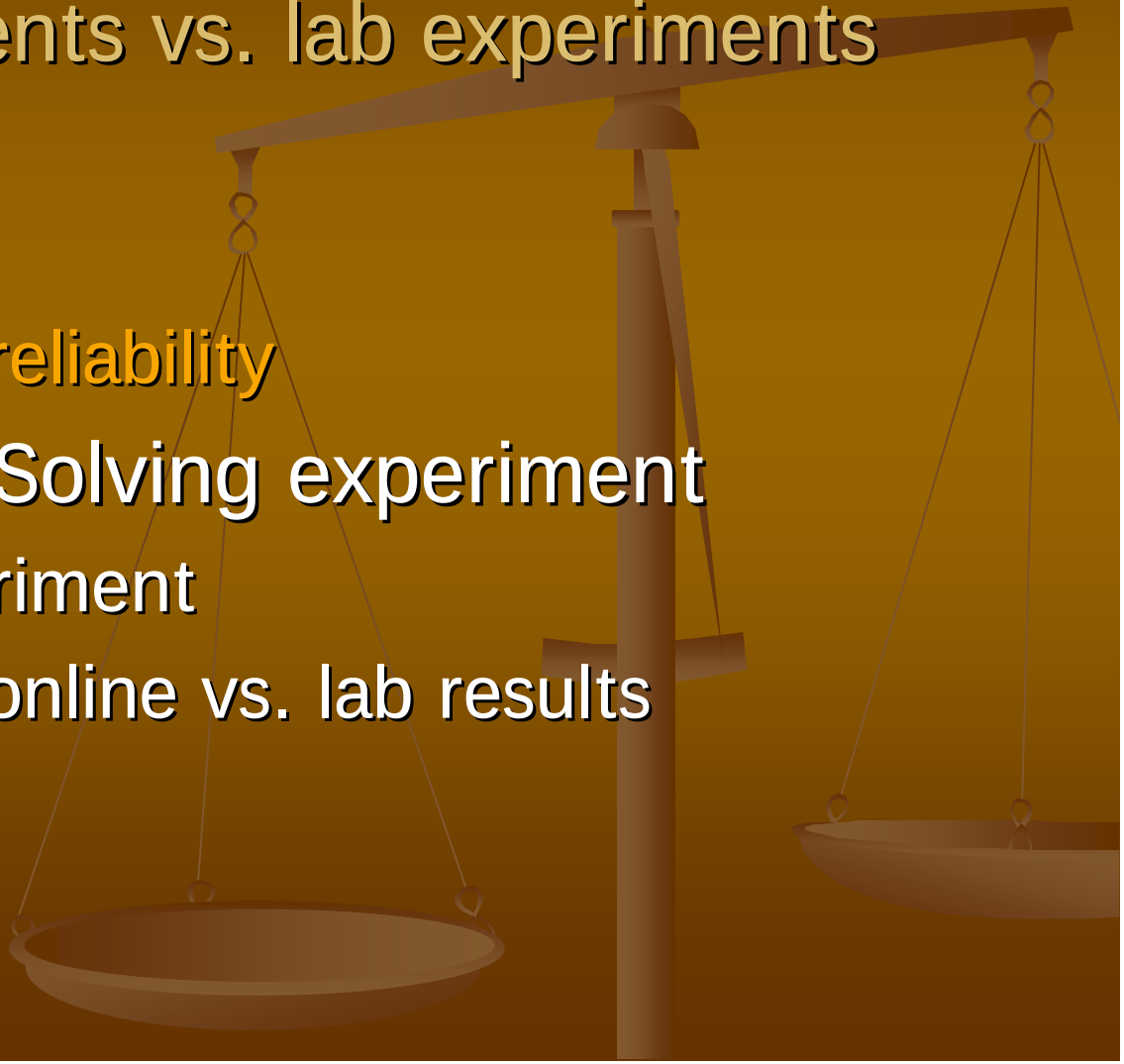

Reliability of Online Experiments

- Online and lab results often identical
  (Krantz & Dalal, 2000; Batinic et al, 2002)

- Confirmed in recent studies
  - Questionnaires and scales
    (Bartram & Brown, 2005; Ritter et al, 2004; Gosling et al, 2004; Meyerson & Tryon, 2003; Salgado & Moscoso, 2003; Meyerson, 2001)
  - Cognitive
    - Building concept maps (Koul et al., 2005)
    - Intelligence test (Preckel & Thiemann, 2005)
    - Problem solving?

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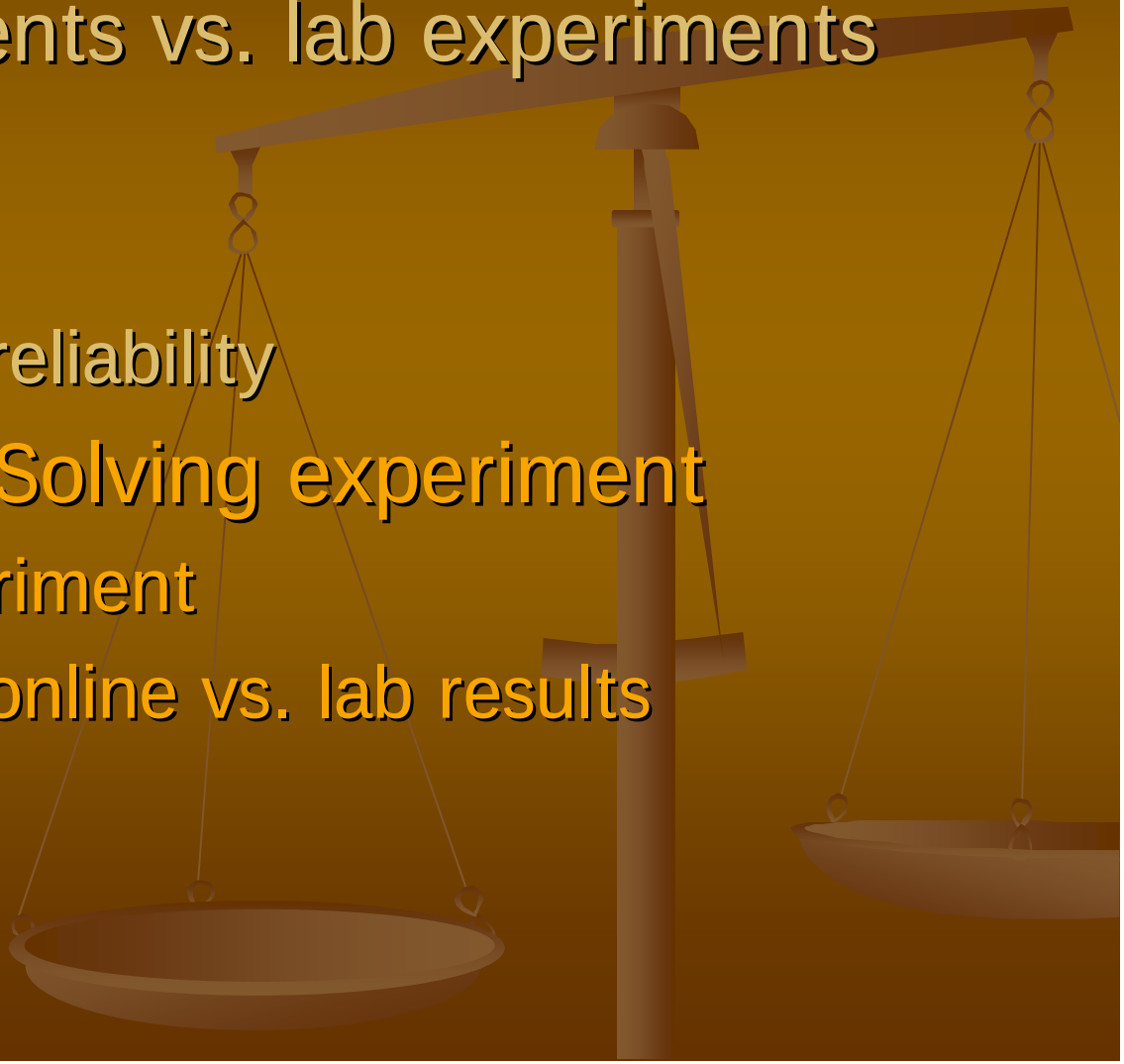
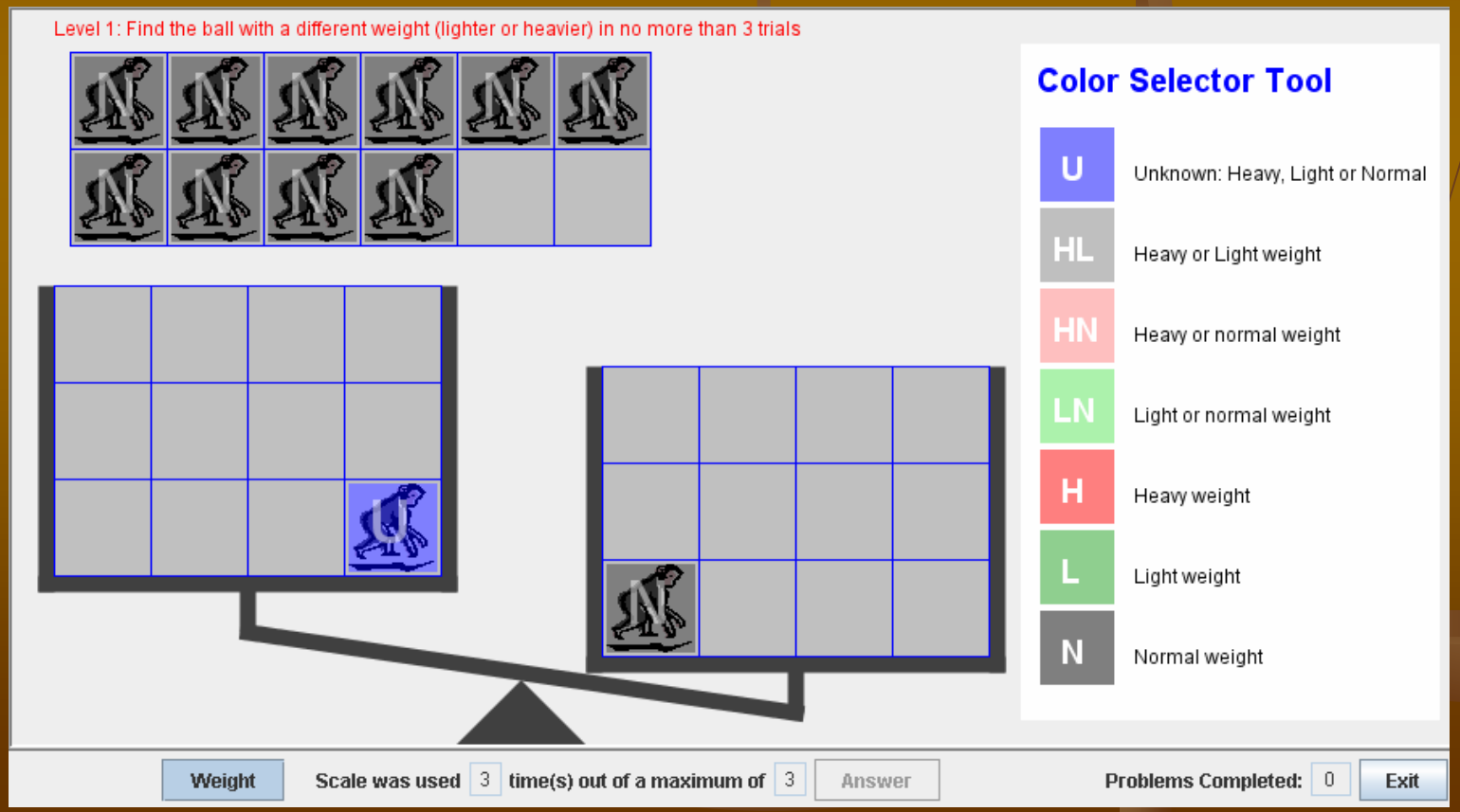


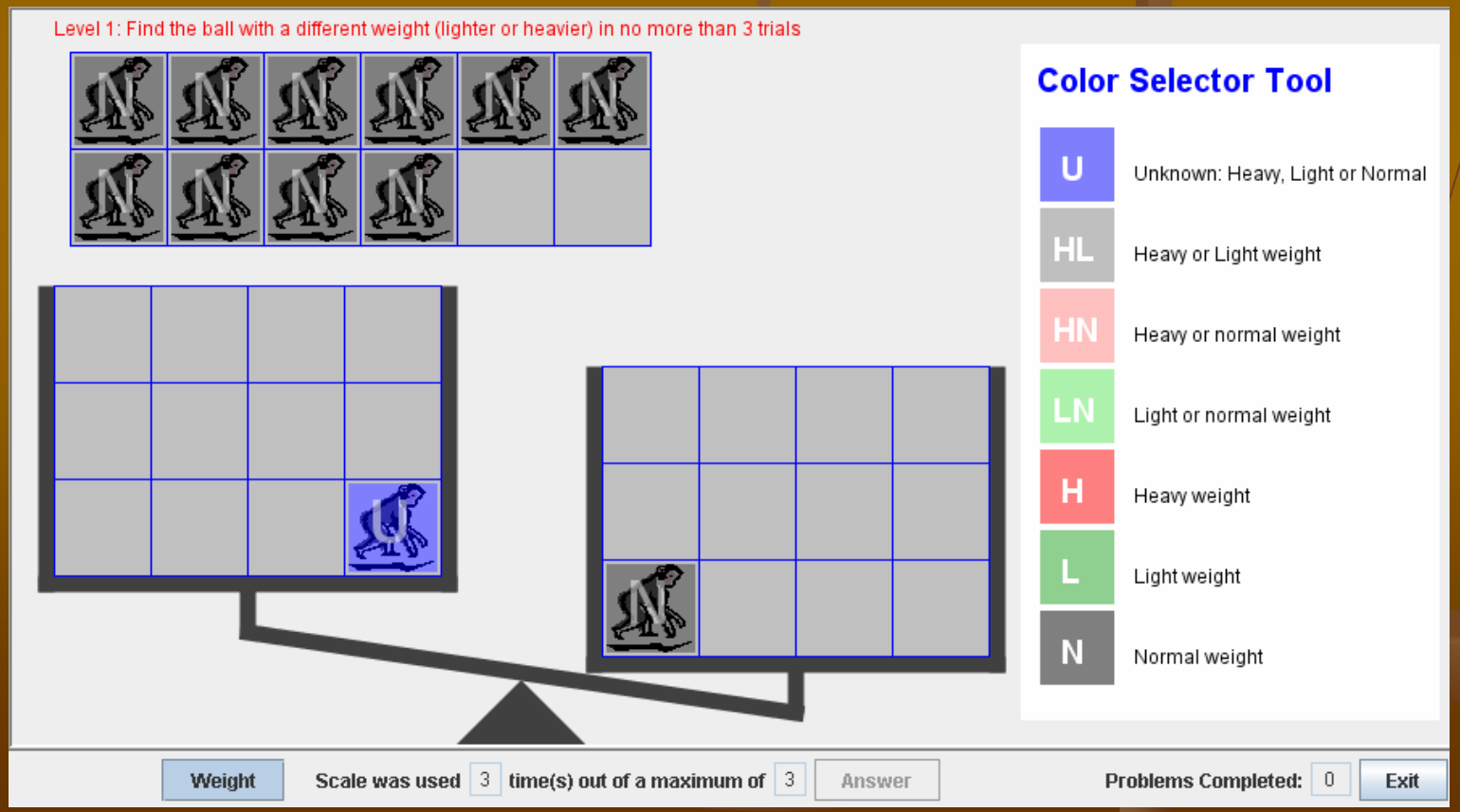
Gizmo Problem Solving Experiment

- Goal: Study learning in problem solving tasks
- “Find, with three uses of a scale, the one gizmo that is either heavier or lighter than the rest of a set of 12 gizmos”



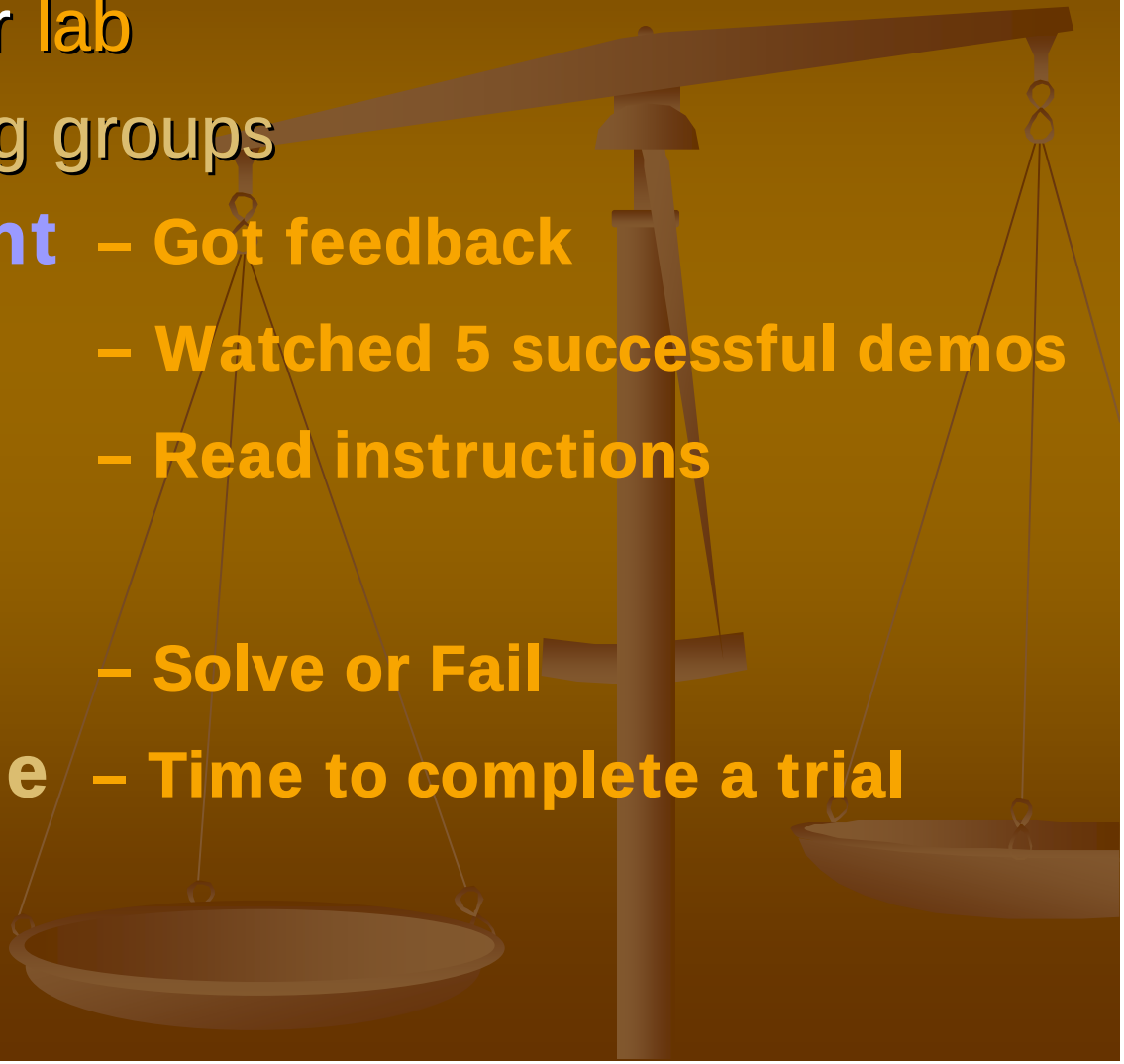
Gizmo Problem Solving Experiment

- Java applet
- Target Gizmo randomly selected on each trial (3 weighing)



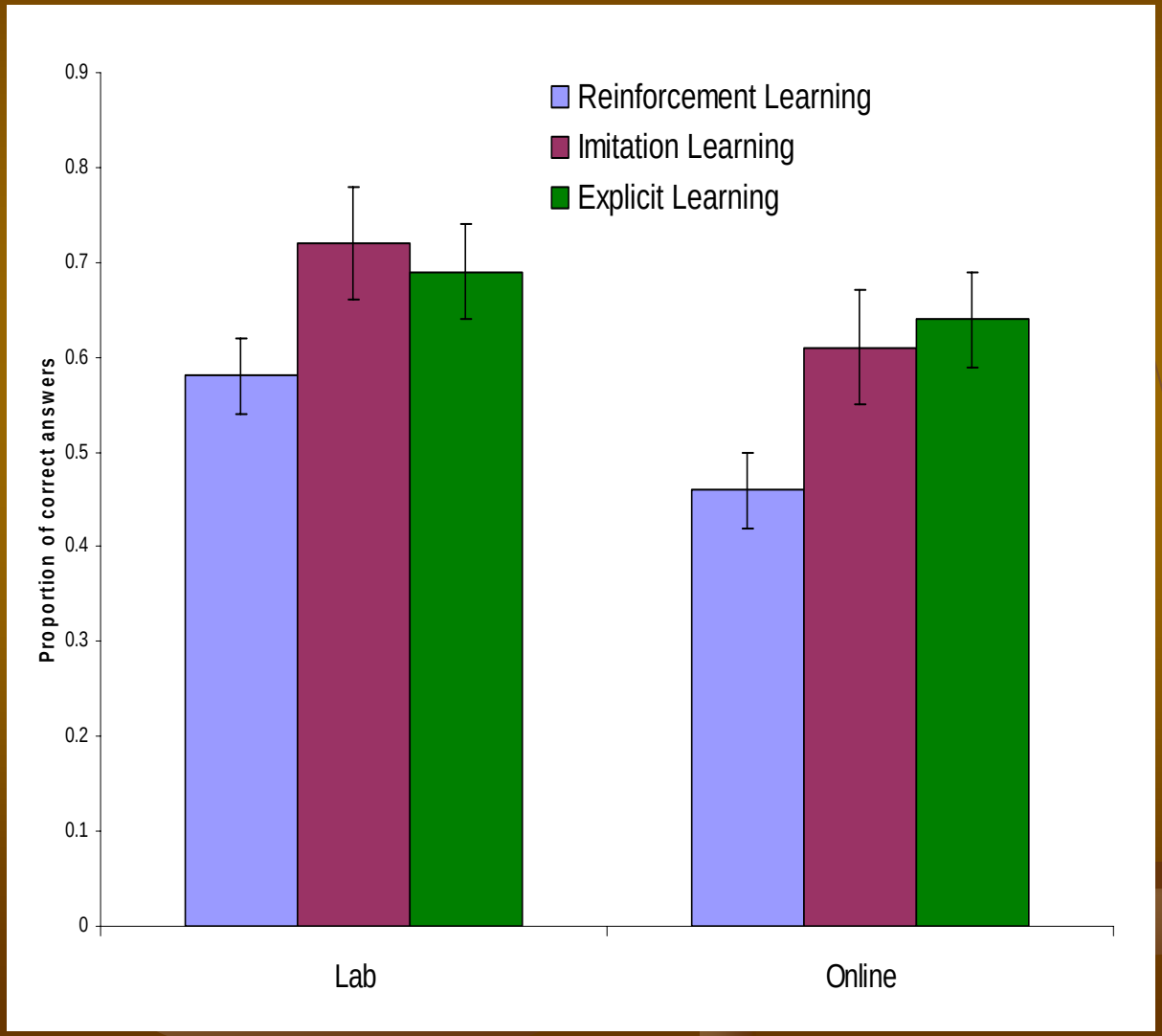
Experimental setup

- Location: online or lab
- 3 different learning groups
  - **Reinforcement** – **Got feedback**
  - **Imitation** – **Watched 5 successful demos**
  - **Explicit** – **Read instructions**
- Measured
  - **Accuracy** – **Solve or Fail**
  - **Response Time** – **Time to complete a trial**



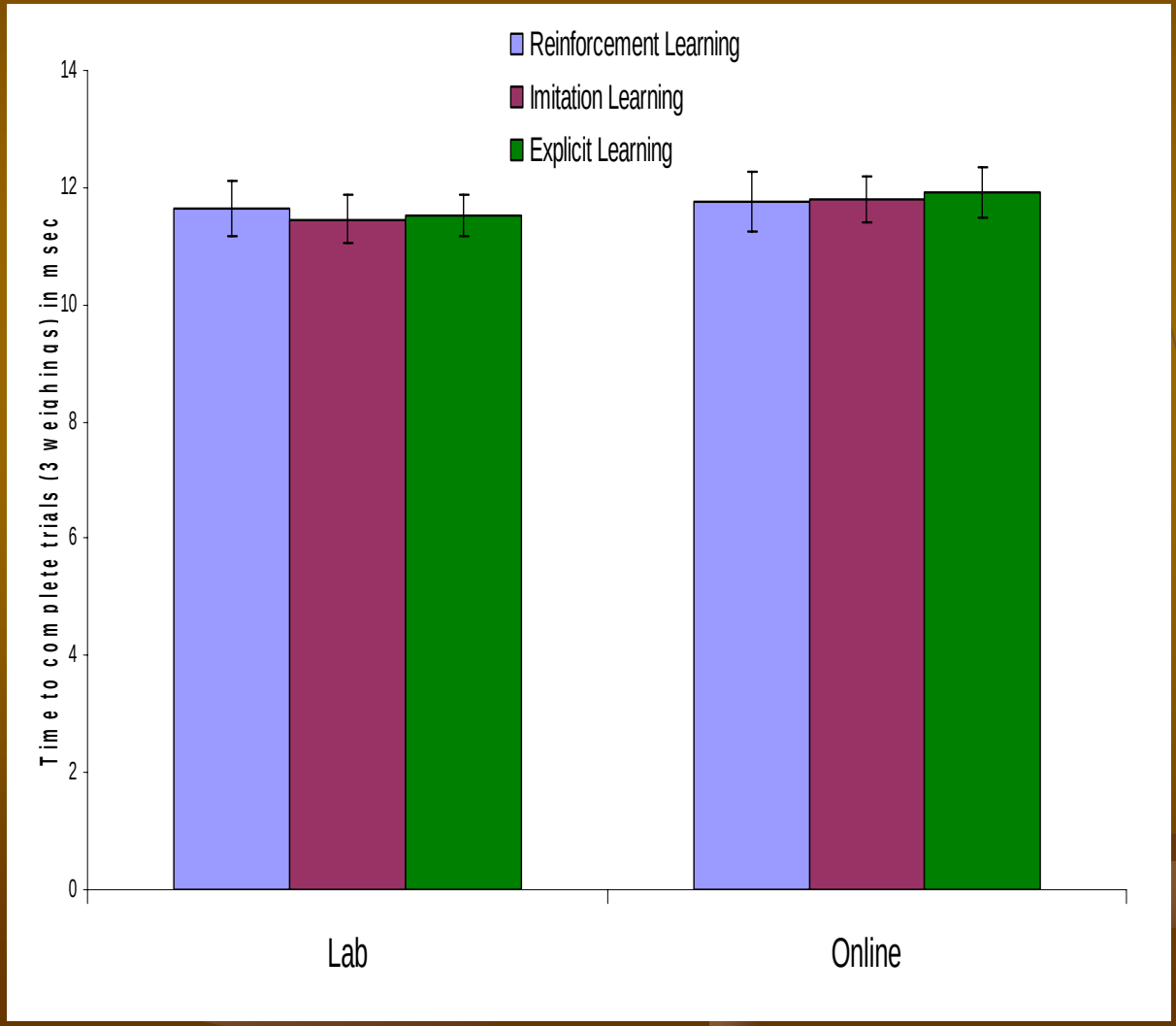
Accuracy

- Learning situation matters: **Imitation** and **Explicit** better than **Reinforcement**
- **Online method is reliable**
  - No main effect or interactions with *location*



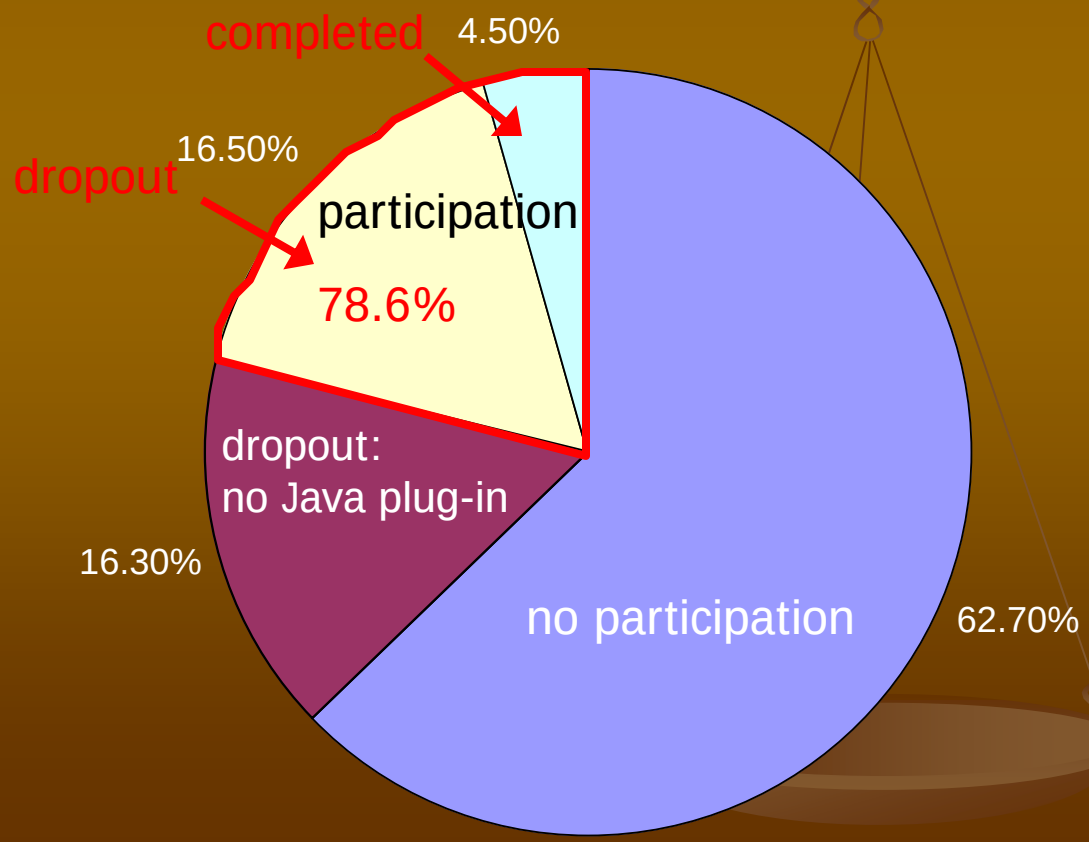
Response Time

- No effect of learning situation
- **Online method is reliable**
  - No main effect or interactions with *location*



Online: participation and dropout

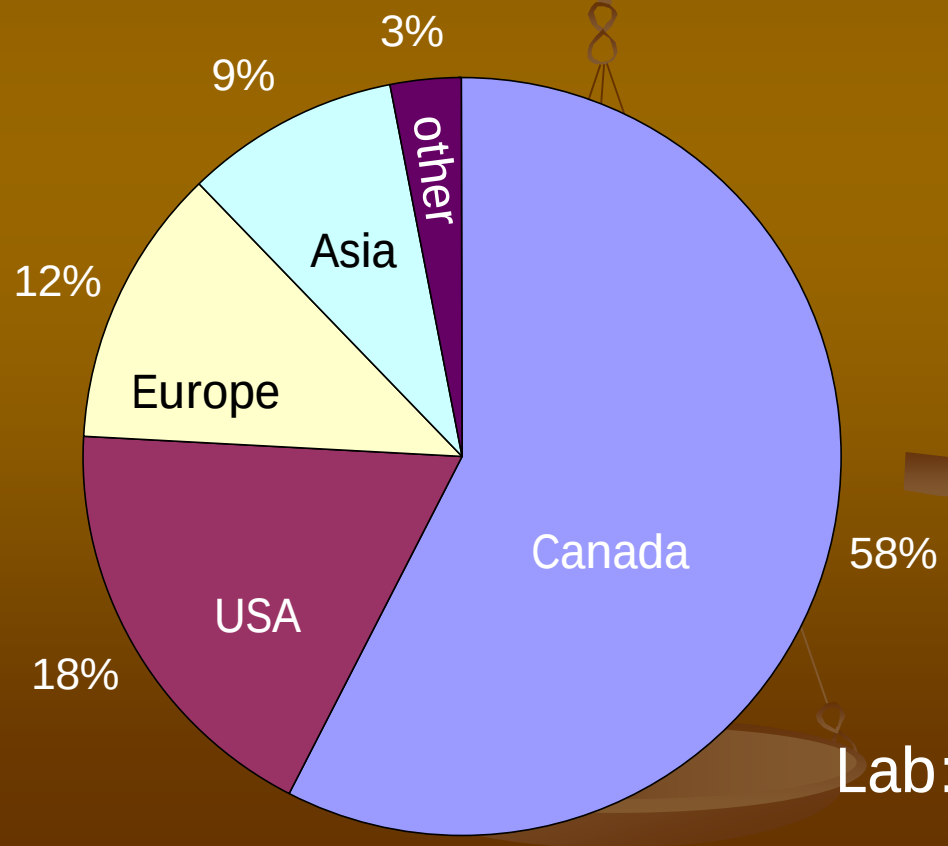
- Dates: Feb. 16 to Sept. 30, 2005
- Visitors: 600



Lab: no dropout

Online: sample diversity

- Subject pool participants: N = 34
- Unselected web users: N = 33



Lab: local population

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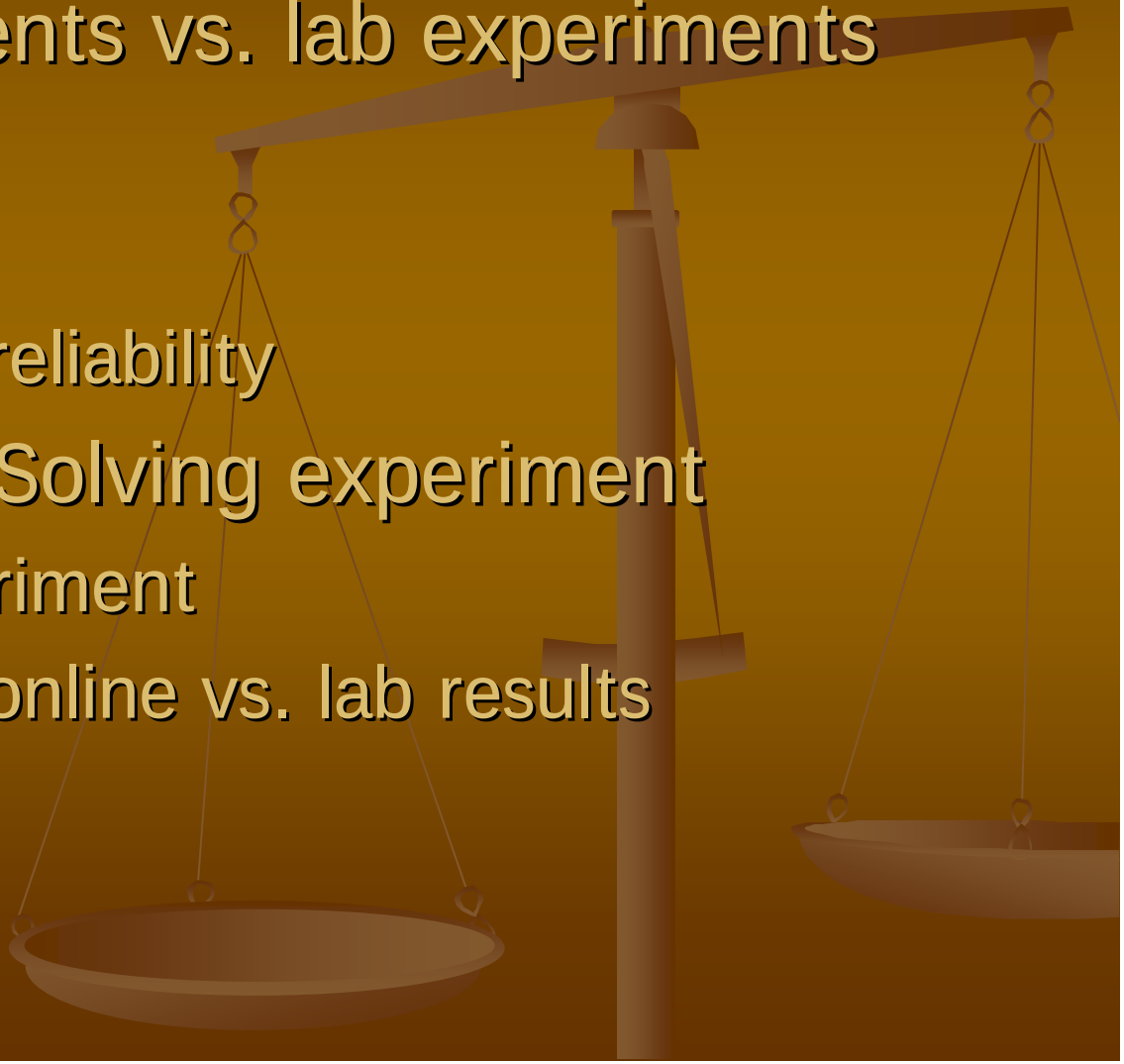
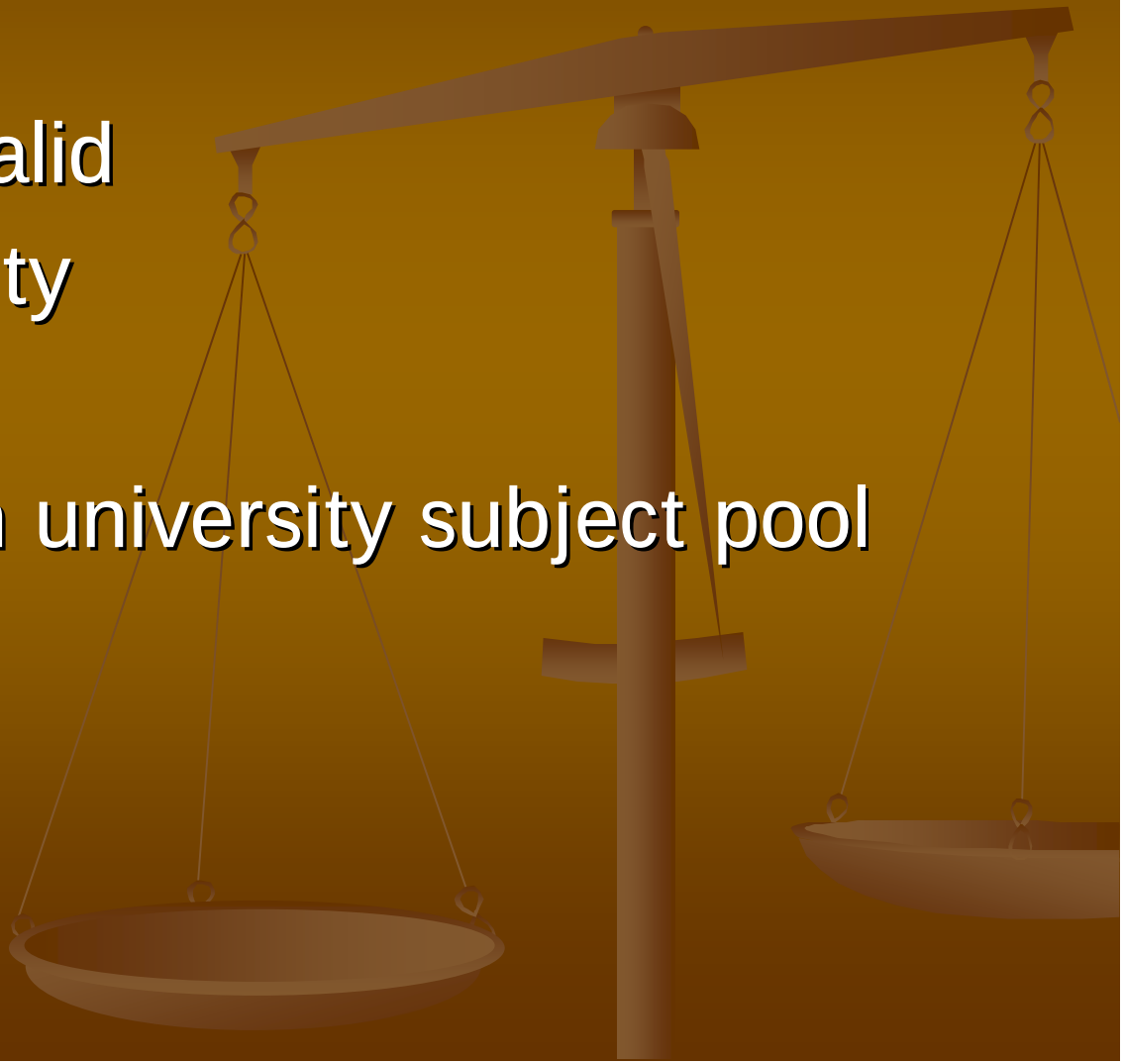


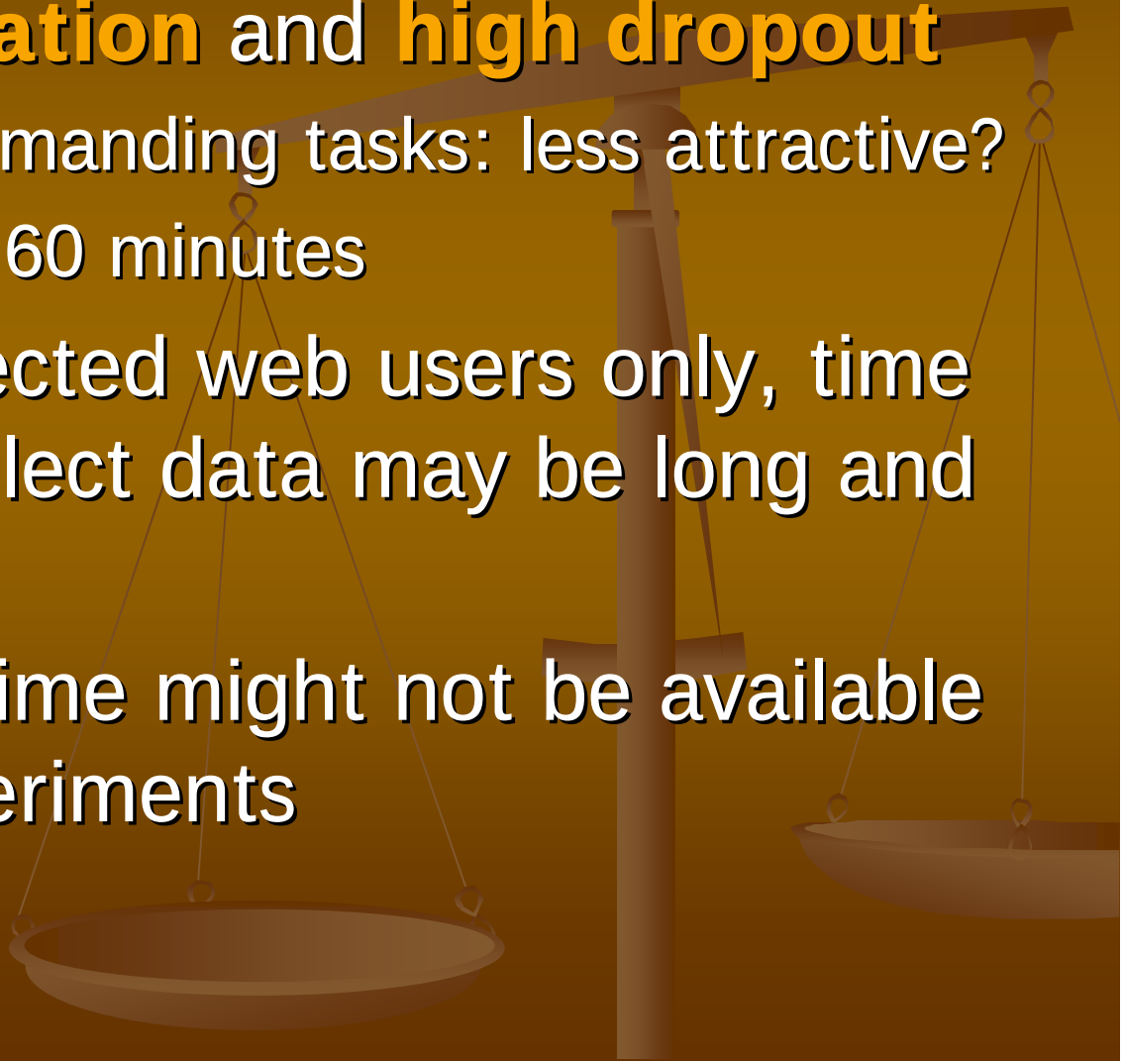
Discussion - Pros

- Reliable and valid
- Sample diversity
- Automation
- Combines with university subject pool



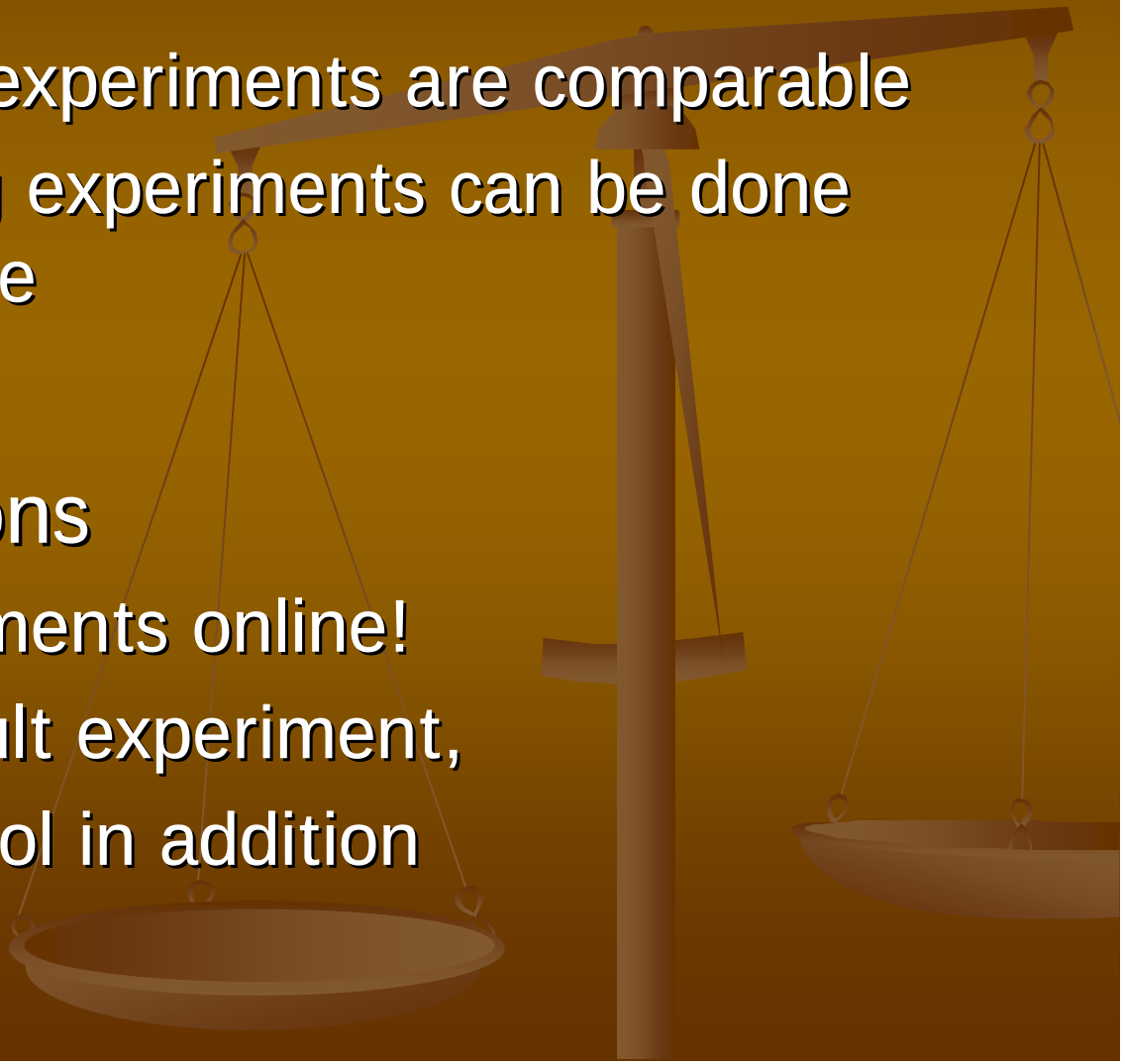
Discussion - Cons

- **Low participation** and **high dropout**
  - Cognitively demanding tasks: less attractive?
  - Length: 45 to 60 minutes
- If using unselected web users only, time required to collect data may be long and variable
- Tools like E-Prime might not be available for online experiments



Conclusions and recommendations

- Conclusions
  - Online and lab experiments are comparable
  - Problem solving experiments can be done effectively online
- Recommendations
  - Do your experiments online!
  - If long or difficult experiment, use subject pool in addition



Thank you!

- Collaborators
  - Thomas R. Shultz
  - Kris Onishi
  - Yoshio Takane
  - Simcha Samuel
- Questions, comments?

Online Experiments Literature (1)

- Reips, U.-D. (2000). The Web experiment method: Advantages, disadvantages, and solutions. In M. H. Birnbaum (Ed.), Psychological Experiments on the Internet (pp. 89-118). San Diego, CA: Academic Press.
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Online Experiments Literature (2)

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