Craft of Research

WEEK 4: RESULTS AND DISCUSSION SECTION

INSTRUCTOR: YVONNE FARAH

Outline

Results

Discussion

Broader Impact

Our progress

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Week 1:
What is research?
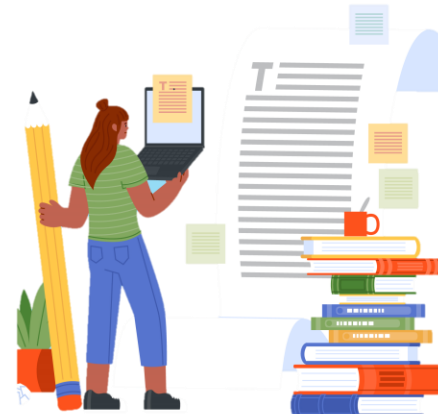

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Week 2:
Problem Statements

Image by Freepik

Week 3:
Literature Reviews

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Week 3-4:
Methods

What's next…

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Week 4 (we are here!)
Results and Discussion

Results section key objectives

1. To show progression on specific findings

2. To communicate the findings and non findings

Before writing the results section

- Consider the following questions:
  - ✔ What is the most logical way to present your results?
  - ✔ Do you understand what the results mean beyond statistical significance?
  - ✔ Do your results have a collective broader implication?

Case Study

Social perception in Human AI teams: Warmth and competence predict receptivity to AI teammates

(Watson et al., 2023)

Harris-Watson, A. M., Larson, L. E., Lauharatanahirun, N., DeChurch, L. A., & Contractor, N. S. (2023). Social perception in Human-AI teams: Warmth and competence predict receptivity to AI teammates. *Computers in Human Behavior*, *145*, 107765.

Week 2:
Problem Statements

AI technologies are being implemented in a variety of systems in our daily lives. The addition of an AI teammate introduces **challenges to the team** unique to the implementation of a technological new comer, due to AI being distinct from human counter parts. **When team members resist the addition of an AI teammate, team outcomes suffer negatively.** This study aims to explore how **AI warmth and competence** impact receptivity toward AI teammates (Watson et al., 2023).
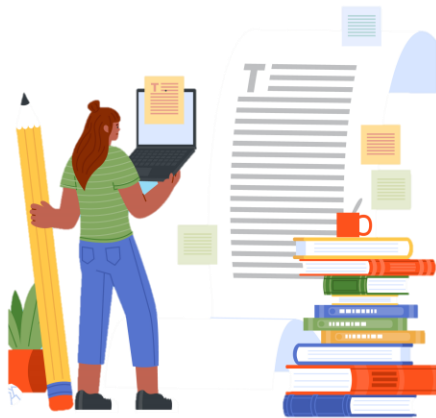
Week 3:
Literature Reviews

Literature review with several sub-themes that set the ground for the study:

- **AI Teammates** as new comers

E.g., *The addition of advanced technologies into organizations has been associated with an increase in job insecurity (Hoff & Bashir, 2015)*
The addition of an AI teammate is a strong team membership change event (Trainer et al., 2020)

- Conceptualizing **receptivity** to AI teammates
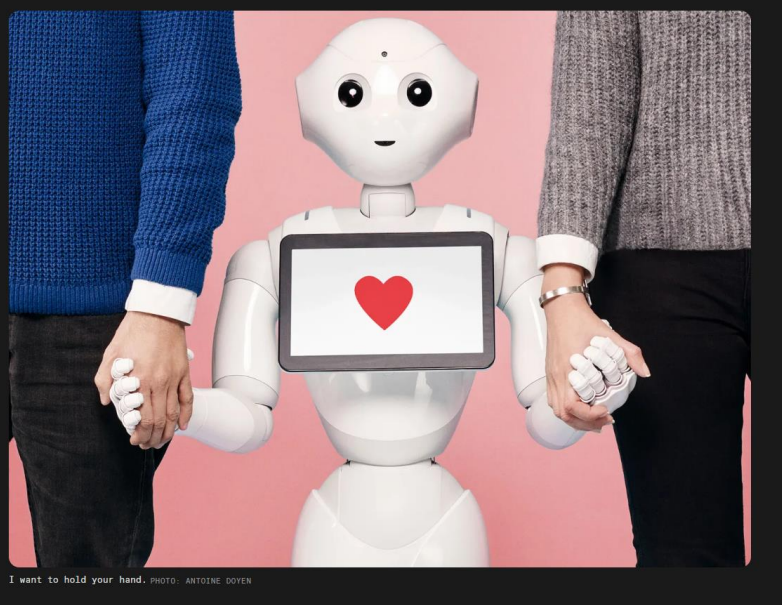- Universal dimensions of **agent perception**

Week 3-4:
Methods

- Participants randomly assigned to one of eight possible AI teammate videos
- Videos included:

Pepper

IBM Watson

Sophia

TARS

CASE

K-2SO

At Pepper's launch event, SoftBank CEO Masayoshi Son asked the robot to describe some of its functions. "Masa, I don't want to show off," Pepper replied, "this might take over 100 hours."
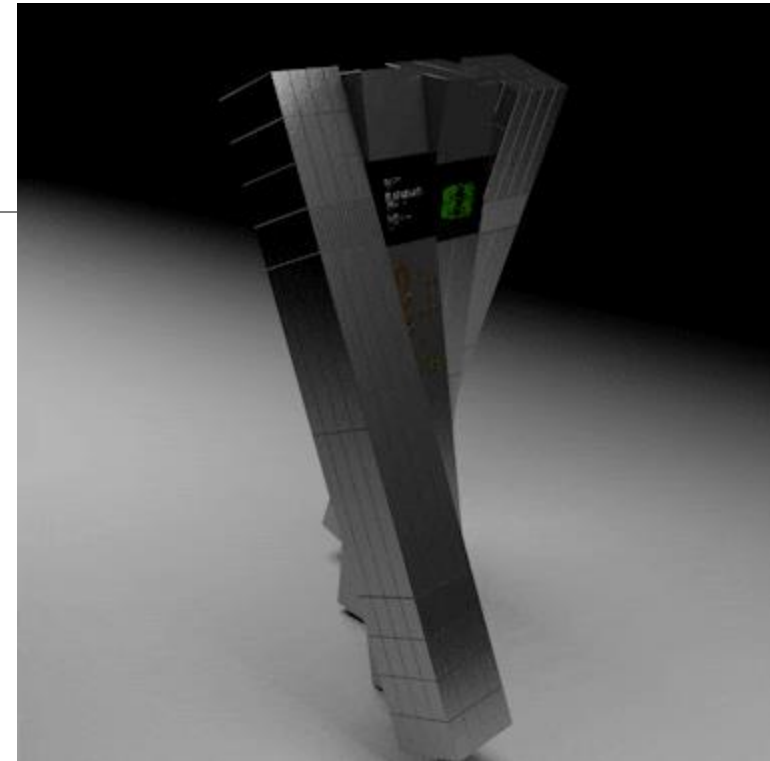
I want to hold your hand. PHOTO: ANTOINE DOYEN

https://robotsguide.com/robots/pepper

https://www.starwars.com/databank/k-2so-kay-tuesso

https://www.raspberrypi.com/news/go-interstellar-and-build-your-own-replica-tars-robot/

Methods set the stage for <mark>results</mark> by introducing the Measures of the study

1. *Warmth perceptions:* participants filled 6 item measures of warmth (friendly, well-intentioned, trustworthy, warm, good-natured, sincere)
2. *Competence perceptions*: competent, confident, capable, efficient, intelligent, skillful
3. *Receptivity to AI teammate:*
- Reflection: adapting team processes
- Knowledge utilization: recognition and adoption of AI teammate skills
- Psychological acceptance: social attitudes and recognition

Methods also set the stage for <mark>results</mark> by describing the data analysis approach

1. ANOVA to evaluate significant differences in warmth and competence between the AI teammates
2. Multiple regression models (receptivity regressed on warmth and competence)

Week 3-4:
Methods

Report results in a logical order to tell the story

Warmth and competence perceptions
 1. **Approach the Niche:** "We first conducted a one-way ANOVA to evaluate whether there were significant differences in the mean perceived warmth and competence ratings of the AI teammates" (Watson et al., 2023, p.7)
2**. Occupying the Niche:** "Results revealed significant differences in both the perceived warmth and competence ratings of AI teammates" (Watson et al., 2023, p.7) ; "Pepper was significantly lower in perceived competence than all other AI teammates" (Watson et al., 2023, p.7) ; "Rove was significantly lower in perceived competence than CASE and IBM Watson" (Watson et al., 2023, p.7) ; "Rove and IBM Watson were significantly lower in perceived warmth than K-2SO, Pepper and Vero" (Watson et al., 2023, p.7).

"Results support that both warmth and competence perceptions of AI teammates positively influence all components of receptivity to AI" (Watson et al., 2023, p.7).

Tips for Writing Results Sections

- Organize results reporting logically
  - Follow your methodology/analytic plan/content areas
  - Should be very stepwise
- Include the statistical/numeric results, as well as the interpretation

- **Tense**: Present
- **Length**: Depends on your methods
- **Number of Sources**: Depends on when you're interpreting the findings

Now, let's discuss our findings!

1) Provide extended interpretations

2) Expand the meaning of the results outside of the study

3) Indicate ho the results add/relate to knowledge in the field

4) Acknowledge study limitations

5) Propose future research

Before Writing the Discussion Section

- Consider the following questions:
  - ✔ What were the main findings?
  - ✔ What were the interpretations of the main findings?
  - ✔ What surprised you?
  - ✔ What were the limitations in your study? Be realistic.
  - ✔ What are the broader impacts of your findings? How could the findings be used in the real world?

Basic Organization of Discussion Sections

A. **Re-establishing the Territory**
(Grounding the Discussion)

B. **Framing Principal Findings**
(Commenting on the Results)

C. **Re-shaping the Territory**
(Referencing Literature for Support)

D. **Establishing Additional Territory**
(Expanding Beyond the Study)
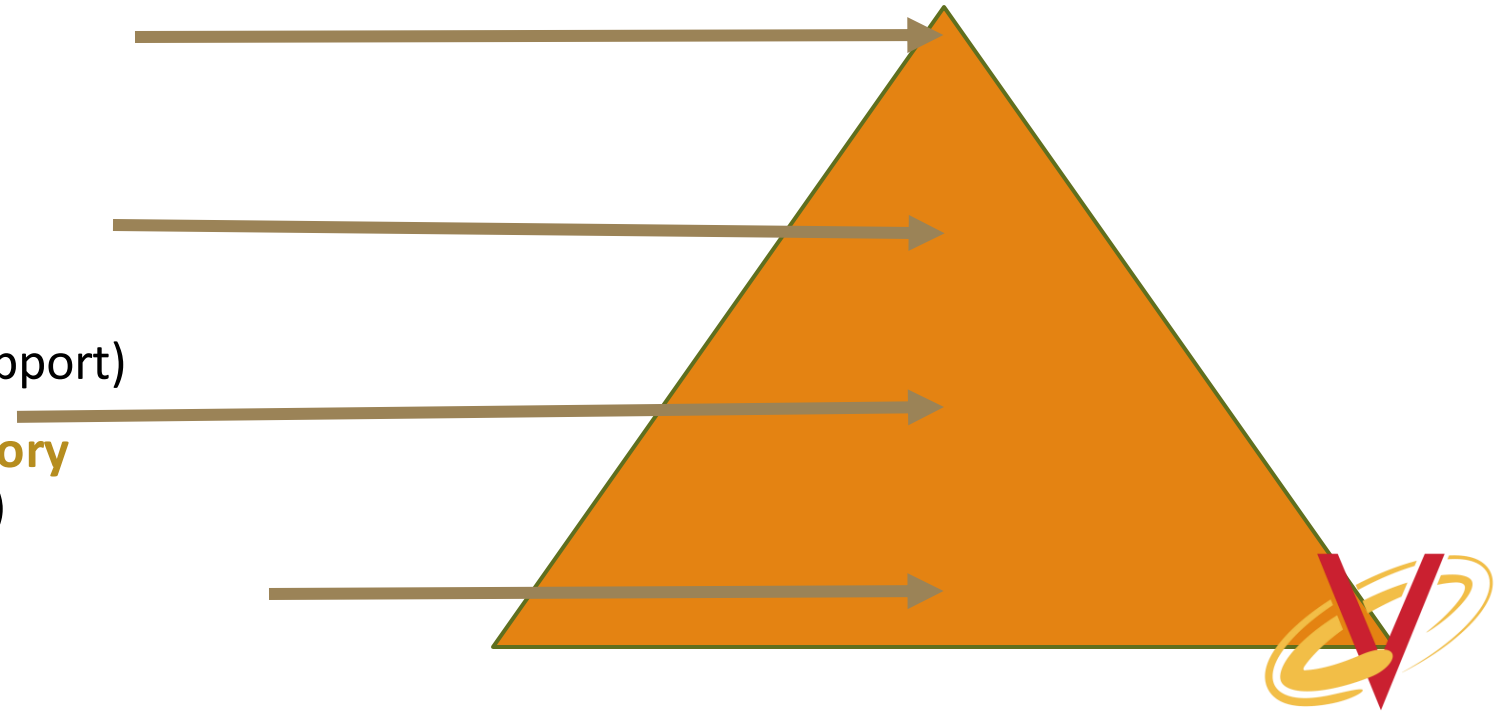
Basic Organization: Re-Establishing Territory   (Grounding the Discussion)

- **Drawing on general background**

- **Drawing on study-specific background**

- **Announcing principal findings**

- **Previewing content**

Example: "Results for reflection were relatively consistent, such that perceived warmth and competence showed similar, positive relationships with reflection" (Watson et al., 2023, p.11)

Basic Organization: Framing Principal Findings (Commenting on the Results)

- **Accounting for Results**

- **Explicating Results**

- **Relating to Expectations**

- **Addressing Limitations**

Example: "Results suggest a much stronger influence of perceived competence than perceived warmth on knowledge utilization. Thus, AI teammates should be designed such as their skills and abilities are clearly apparent and can be integrated to maximize knowledge utilization" (Watson et al., 2023, p.11)

Basic Organization: Reshaping the Territory (Referencing Literature for Support)

- **Supporting with Evidence**

- **Countering with Evidence**

Example: "Dou et al., 2020 found that people's expectations for warmth and competence are in part dependent on the intended application of the robot" (Watson et al., 2023, p.12)

Basic Organization: Establishing Additional Territory (Expanding Beyond the Study)

- **Generalizing Results**

- **Stating the Value**

- **Noting Implications**

- **Proposing Directions**

Example: "Finally, results highlight the value of integrating research on AI agents in the HCI/HRI literature and adjustment to human newcomers in the teams literature. Most models of human reactions to AI agents do not yet capture the complex social and psychological processes of receptivity to a fully interdependent AI teammate" (Watson et al., 2023, p.12)

Logic Flow of Discussion Section

1. Recap of key findings

2. Paragraphs/sections based on main and related findings or by analysis... what do the findings mean? Answer the 'why'

3. Limitations

4. Future directions

5. Broader impact

Broader Impacts

"[T]he potential to benefit society and contribute to the achievement of specific, desired societal outcomes."

Broader Impacts

Criterion:

✔ Why should people outside of research care about what you did?

✔ How does it benefit society?

✔ What positive societal/community outcome did you achieve?

Examples:

- Improved well-being of individuals in society
- Increased economic competitiveness
- Improved national security
- Public scientific literacy

Tips for Writing about Broader Impacts

- Built up for justifying your broader impact

- Demonstrate creativity or originality

- Have a well-organized strategy for accomplishing the goals

- Establish qualifications for those responsible for activities to accomplish goals

Basic Guiding Questions

1. How has your research findings and discussion built up to this point?

   - What is your primary argument you've created?

2. Why and how will your research benefit society?

3. What future steps must be taken for society to benefit?

Assignment

Now, it's your turn to tell a research story!

Pick a journal article you've been excited about, that taught you something new about your research project

Work on a 5 minutes recorded ppt, where you tell the story of the paper based on our course sessions:
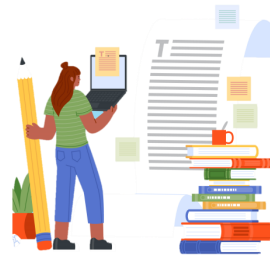
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Week 3-4:
Methods

Week 4:
Results

Week 5:
Discussion