

Agency

Week 8 of 16-867 Human-Robot Interaction

Laura Herlant

Announcements

- Wed March 8 – A Day Without Women
- Next reading assignment somewhat heavy, but already read one of the papers

Cliff Nass – Requirements for Teams

Teammate vs. Partnership

- Common goal
- Mental models
- Subjugate Individual needs (self)
- Interdependence as positive
- Trust
- Self-awareness



Cliff Nass – Ants as team members?

Agree

- Don't have individual desires beyond survival
- Ants do not have a common mental model
- Helps other ants find food by use of pheromone scent trails
- No conscious subsuming of individuality because no awareness of "self"

Disagree

- Team definition too narrow
- Exhibit attributes of teamwork: communication, collaboration, common goal
- Perform a collective effort

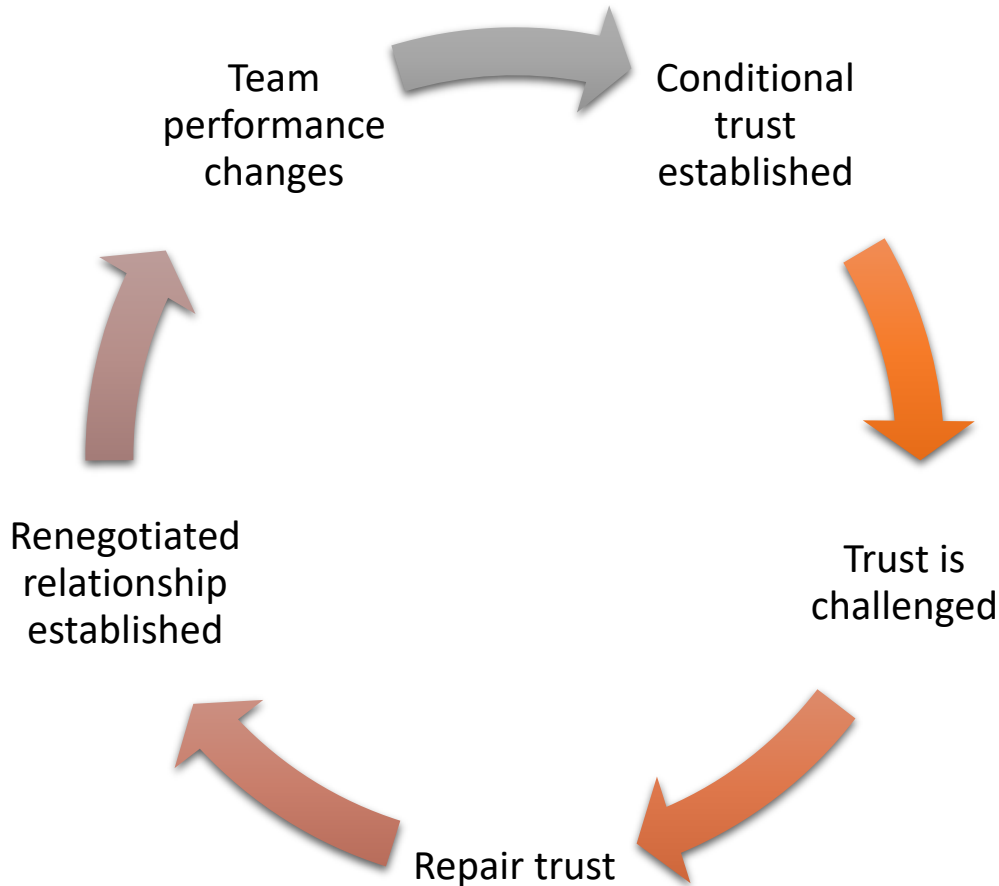
Our class's requirements for Teams

Teammate vs. Partnership

- Common goal
- Mental models
- ~~Subjugate Individual needs (self)~~
- ~~Interdependence as positive~~
- Trust
- Self-awareness



Cliff Nass - Trust



- Cannot trust machines:
 - Machines cannot trust, feel guilt, or betrayal
 - Lack of commitment to team goals
 - Cannot develop mental models of humans
- How can we feel trust towards our cars?
 - No autonomy to act on its own, so predictable
 - Cars are “tools” not “teammates”
 - Confounding trust with confidence or reliability

Our class's requirements for Teams

Teammate vs. Partnership

- Common goal
- Mental models
- ~~Subjugate Individual needs (self)~~
- ~~Interdependence as positive~~
- Trust / Confidence
- ~~Self awareness~~

*Perception of
self awareness*



Perspectives on Agency – Leila Takayama

- *Agency vs. perceptions of agency*
 - Turing Test
 - It is perceptions and subjective realities that people make judgements and act upon
- Disconnect between what people consciously perceive and how they respond to stimuli that they may not consciously perceive

Roomba

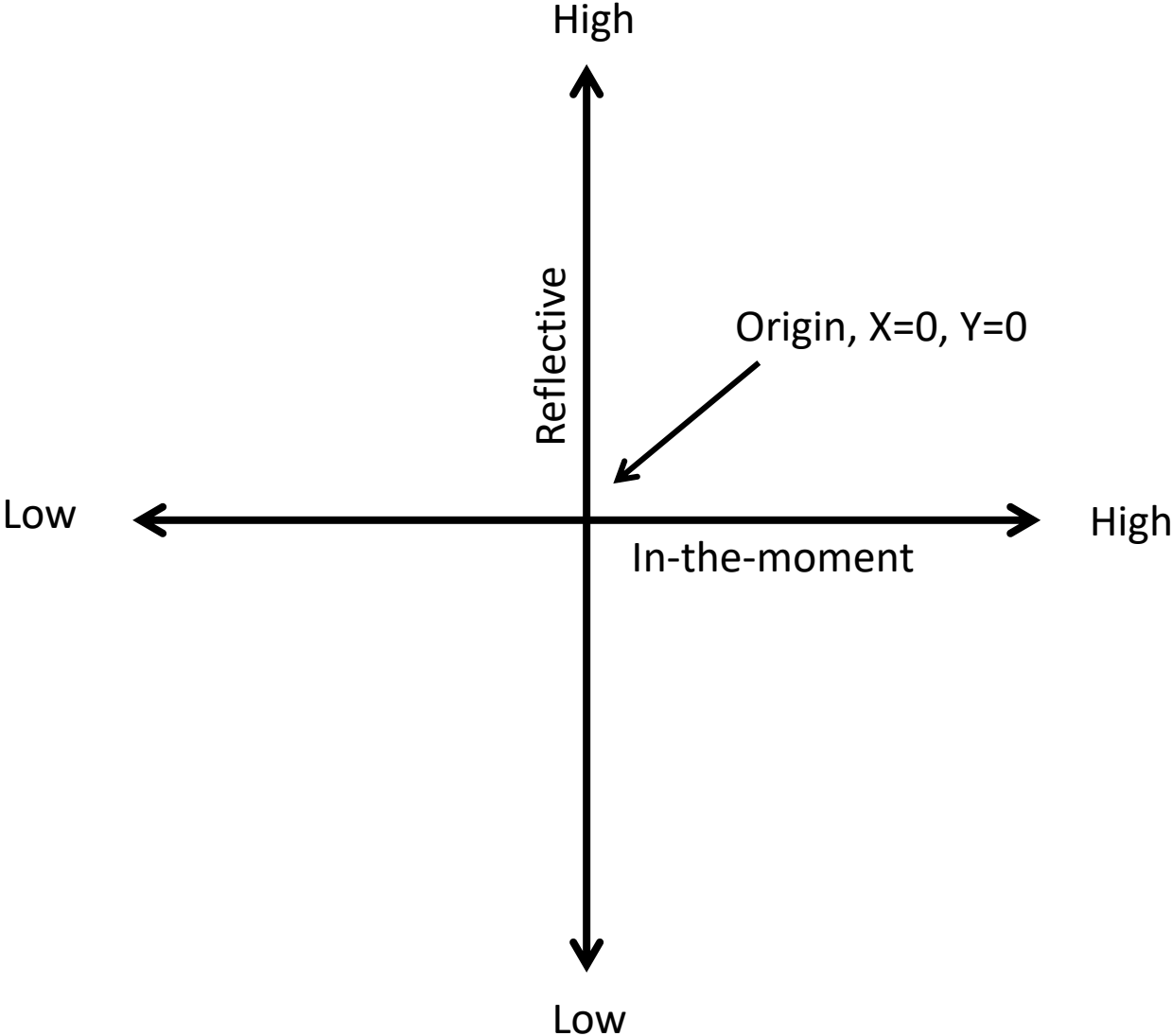
- Some owners perceive Roomba's as agentic objects, and others as just plain machines
- 7 out of 14 Roomba owners did not form social relationships with the Roomba in one study (Forlizzi & DiSalvo, 2006)
- 572 out of 760 messages did not contain any descriptions of intimacy felt towards Roombas (Sung, et al., 2007)



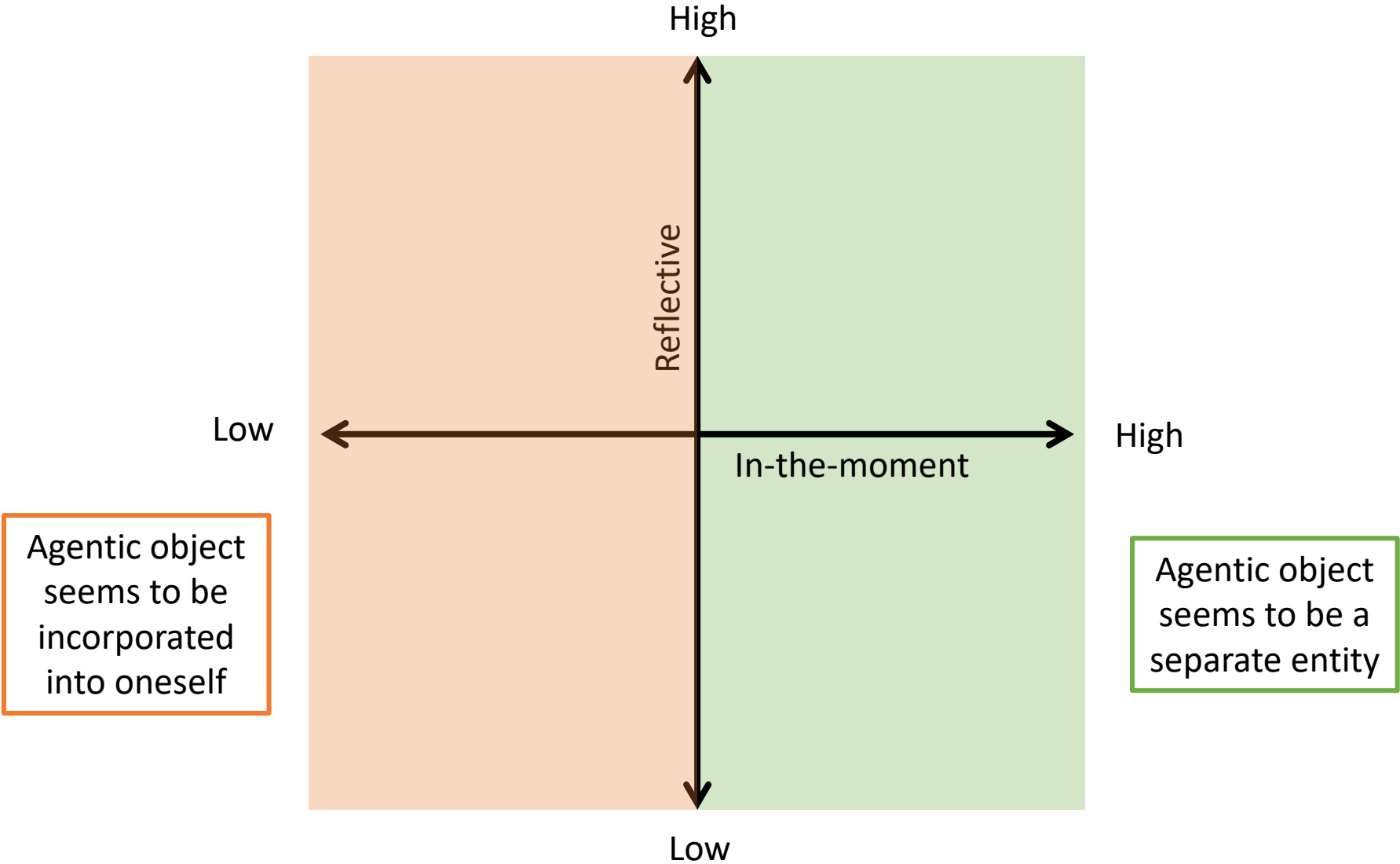
Types of Perspective

- “In-the-moment” perspective – one’s most immediate (sometimes visceral) sense in a situation
 - Bottom-up, built from evolved automatic responses to threats and opportunities
- “reflective” perspective – one’s sense of situation upon more distanced cognition and consideration
 - Top-down, by the nature of reflective thought, consciously constructed

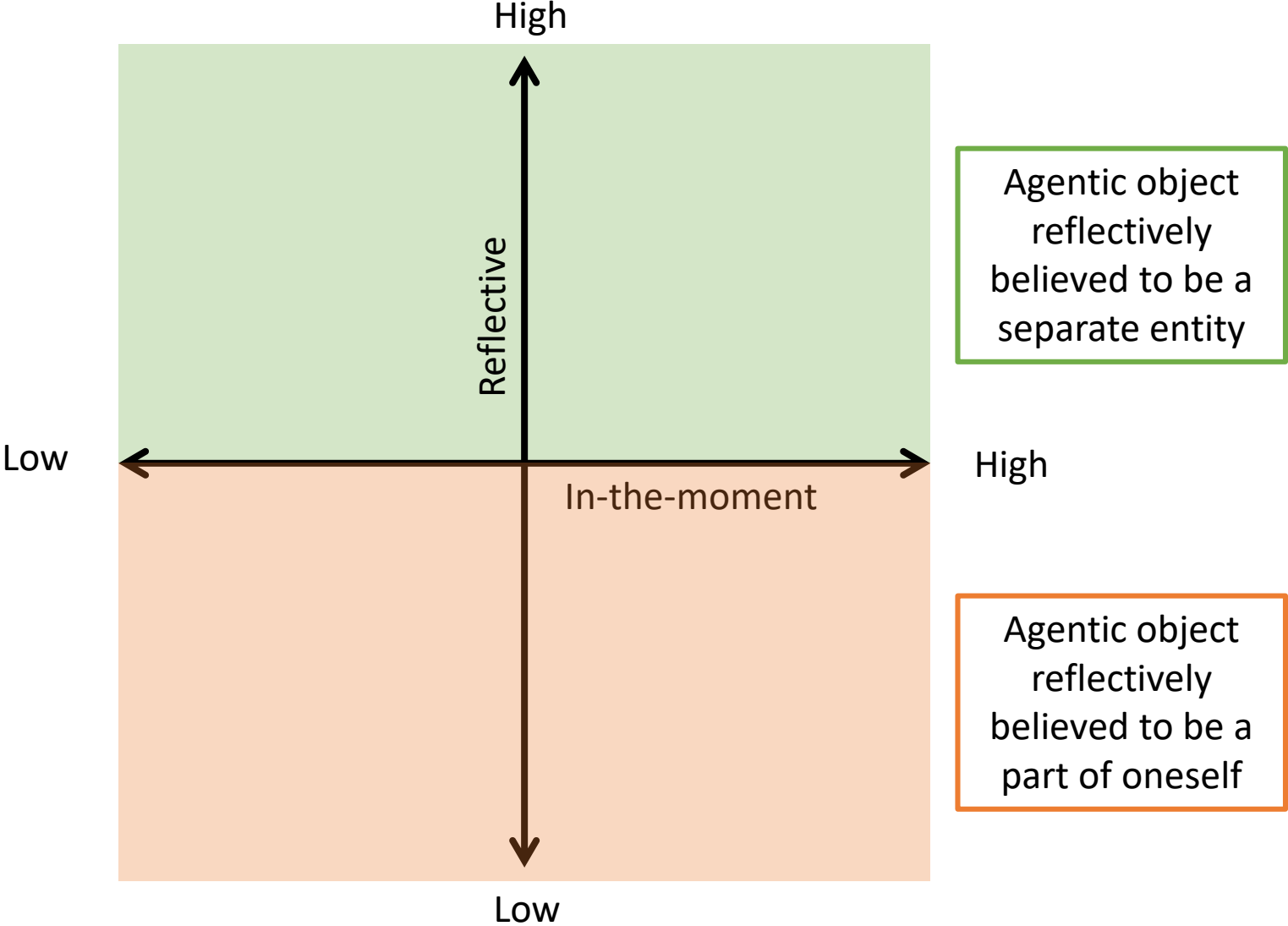
Space of Perceived Agency



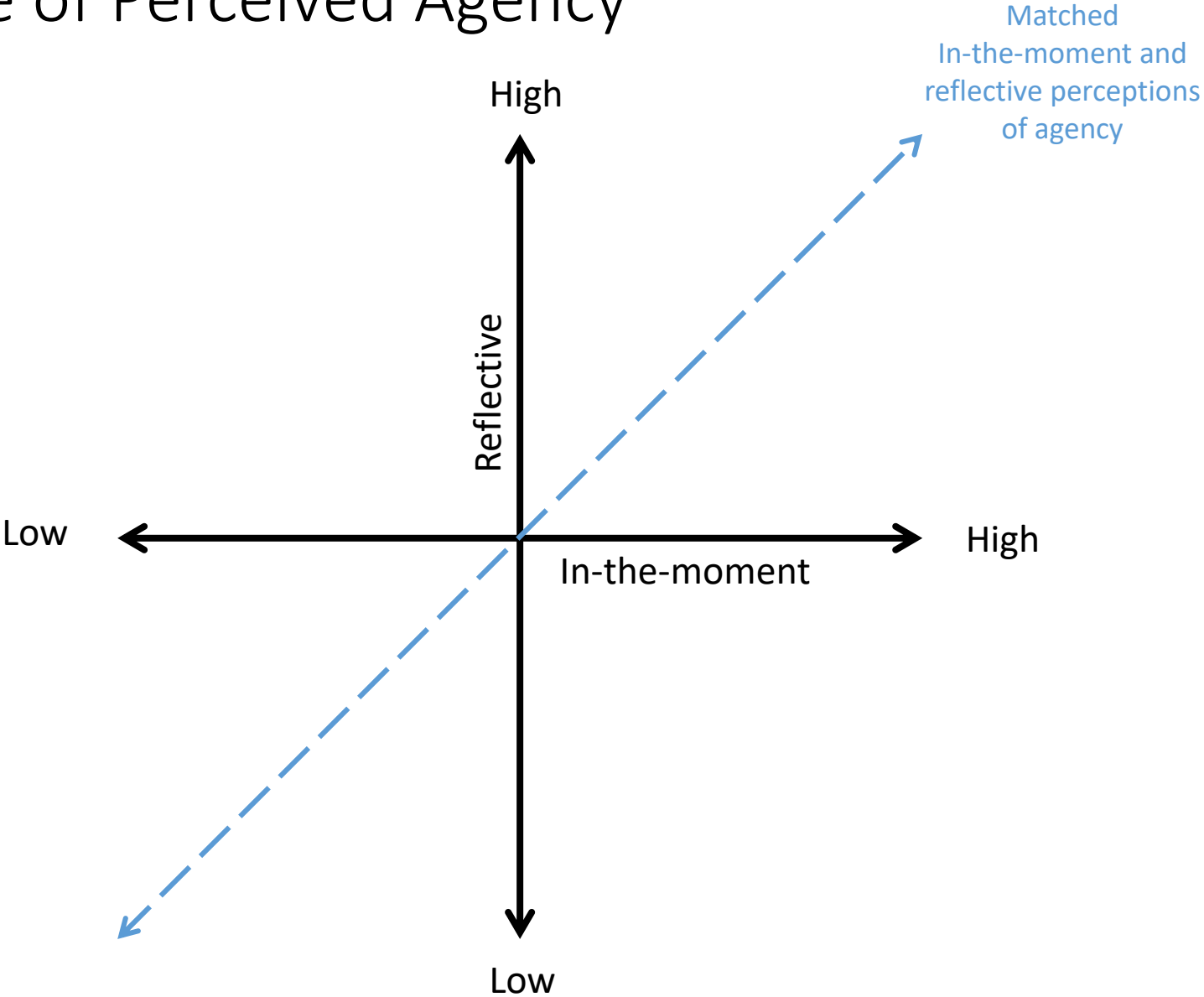
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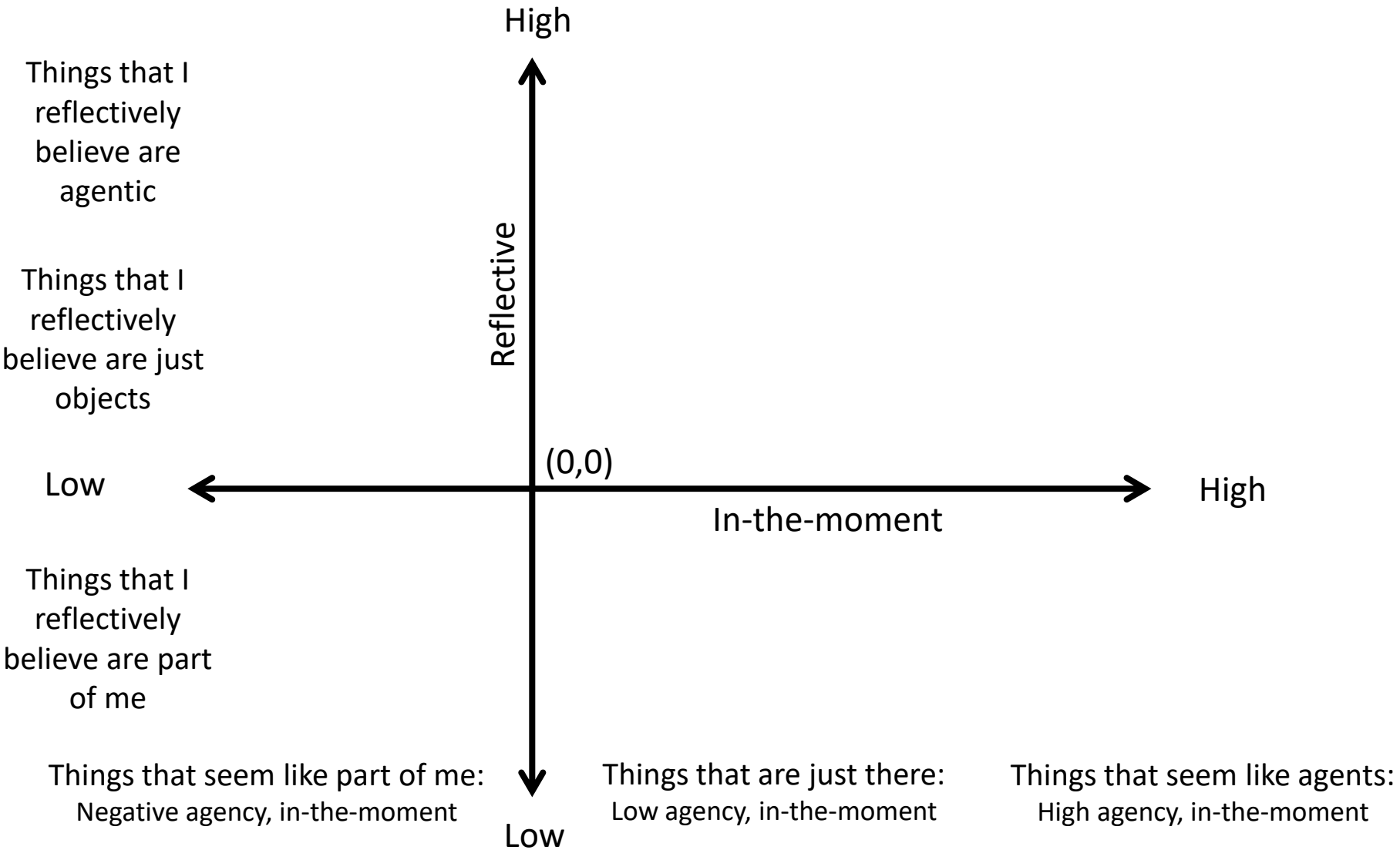
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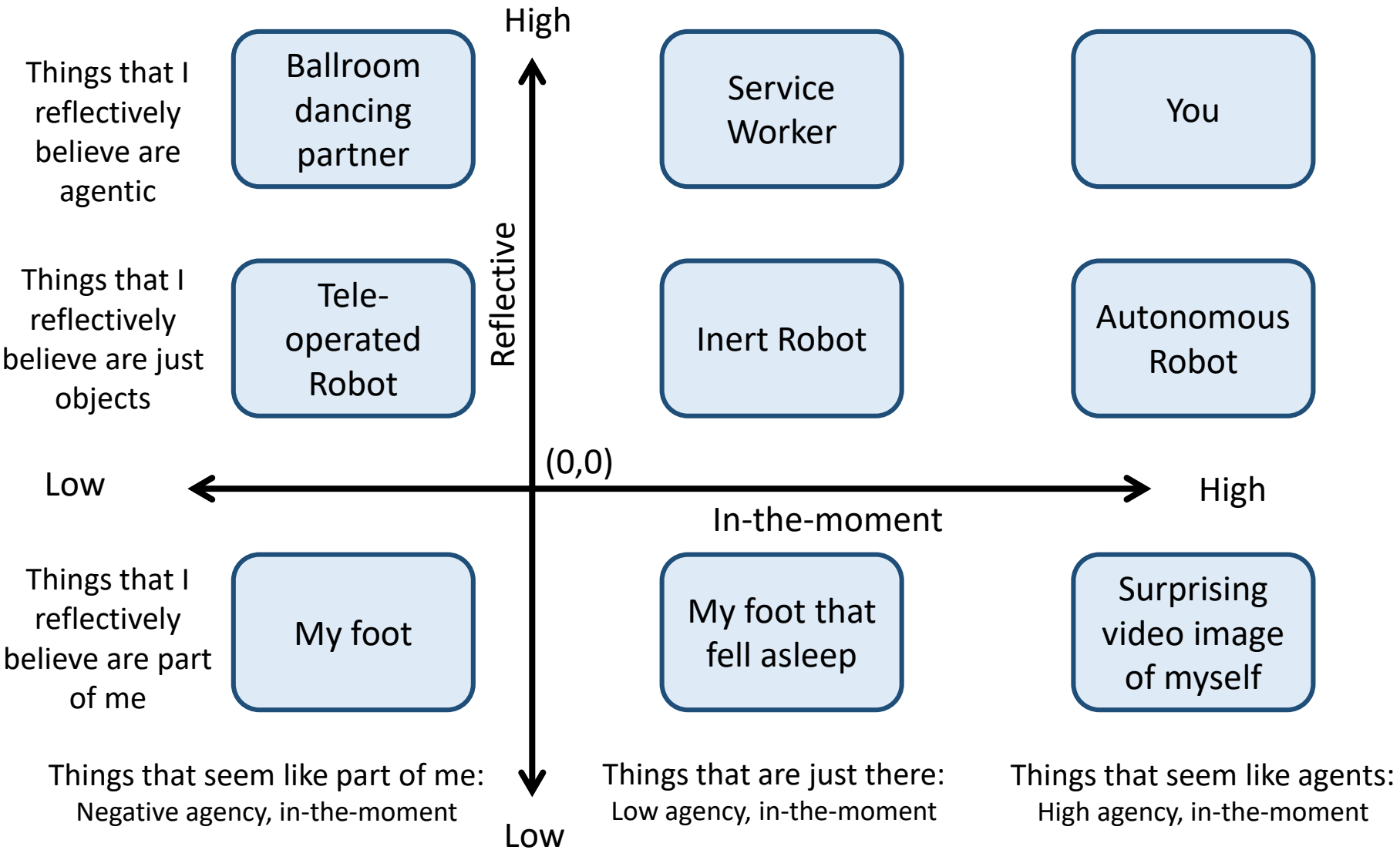
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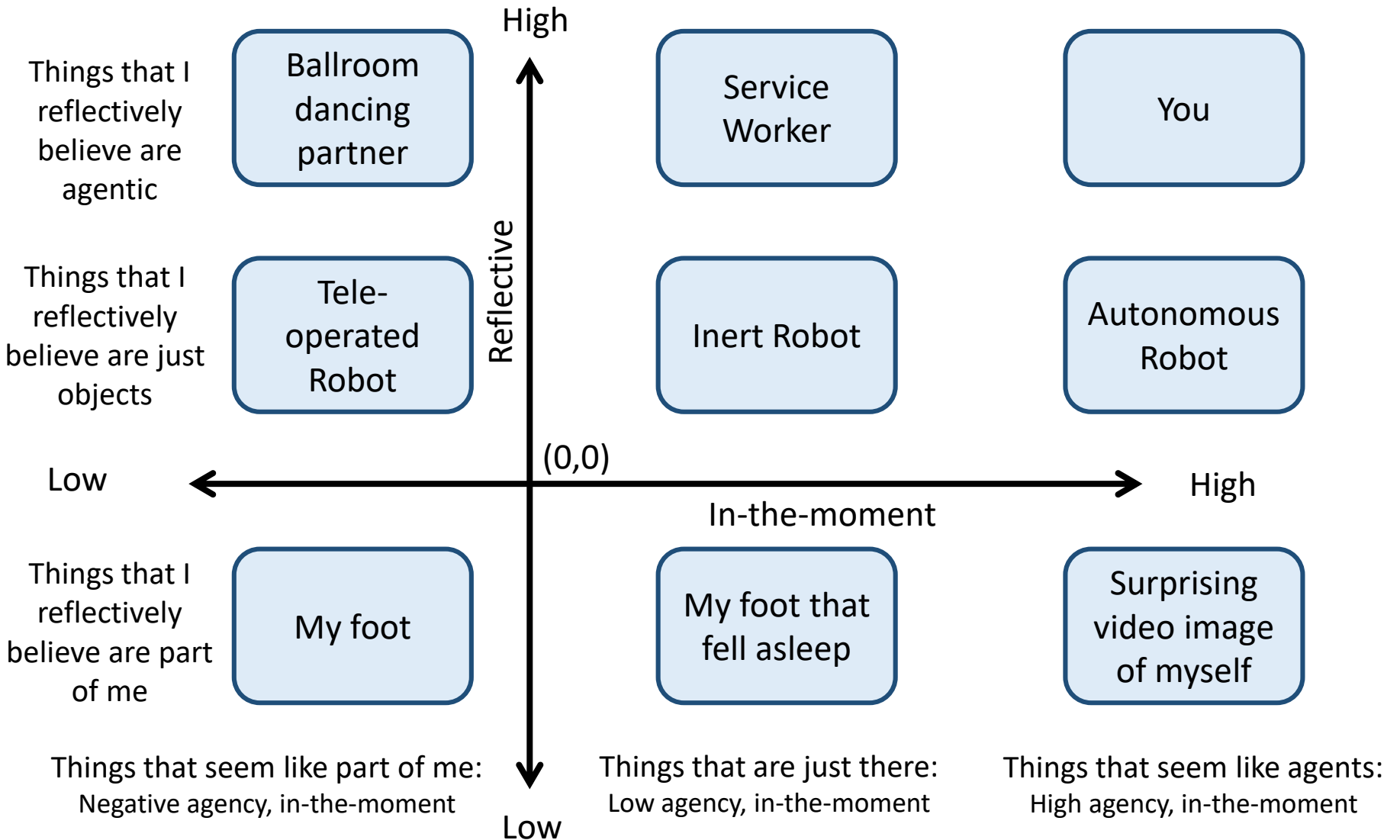
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Space of Perceived Agency



Where does your project fall and why?



Agentic Objects

- Agentic objects – entities that are perceived in-the-moment as if they were agentic despite the likely reflective perception that they are just objects (Takayama, 2009)
- People have an innate ability to respond to agentic objects in ways that are very similar to interacting with other humans (Nass & Moon, 2000; Reeves & Nass, 1996)
- Agentic objects inherit both the authority and responsibility of other humans and human institutions

Heider & Simmel



Robotic Agency

- Creating the perception that robots are agentic objects to be interacted with
- Behave in more humanlike ways by developing and/or displaying human-like capabilities such as:
 - Natural eye gaze
 - Joint activity
 - Human-like gesturing behaviors
- Behave more independently (of the observer's wishes):
 - Disagreeing or acting against the observer's wishes
 - Physically pushing against you
 - Cheating at a competitive game

Interacting through robots

- Examples:
 - DaVinci robot surgery
 - Walking with an exoskeleton
 - Remote telepresence systems
 - Powered wheelchairs and assistive robot arms
- In-the-moment the robots are incorporated into their own sense of agency, but reflectively are viewed as separate from their bodies and sense of “self”
- Perceive the world through the device rather than perceiving the device itself => “invisible-in-use”
 - Reliably functional, predictable, consistent
 - Low latency in control and feedback
 - Sense of control

Agency in personal robotics

- Is the design focus on interaction or relationship/experience?
 - In-the-moment perceptions more important for influencing interactions
 - Reflective perceptions more important for long-term relationships/experience
- Whose agency matters most?
 - An agentic object for the user to interact with
 - Improve a user's sense of their own agency
- Not a dichotomy
 - Robot butlers – highly agentic but invisible-in-use
 - Roombas

Mid-semester Course Evaluation

- Katie Walsh – Eberly Center
- 25~30 minute activity
- Anonymous course feedback that will be incorporated **this semester**
- Kim and I will not be present, but will get a summary of points discussed

- To send additional comments anonymously, please email Katie at kpwalsh@andrew.cmu.edu