

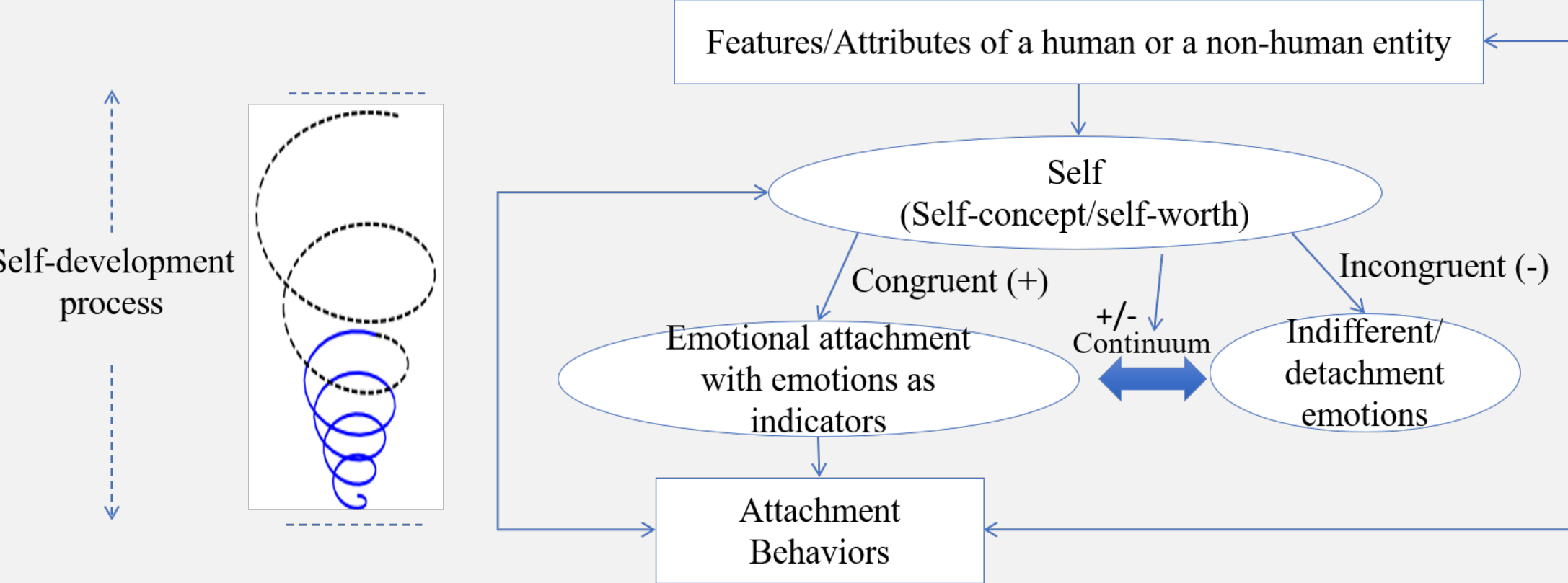
SYNC (Synergistic Yield of Networked Co-evolution): Advancing Human–AI Teamwork for Human Well-being

Lixiao Huang, Arizona State University, lixiao.huang@asu.edu



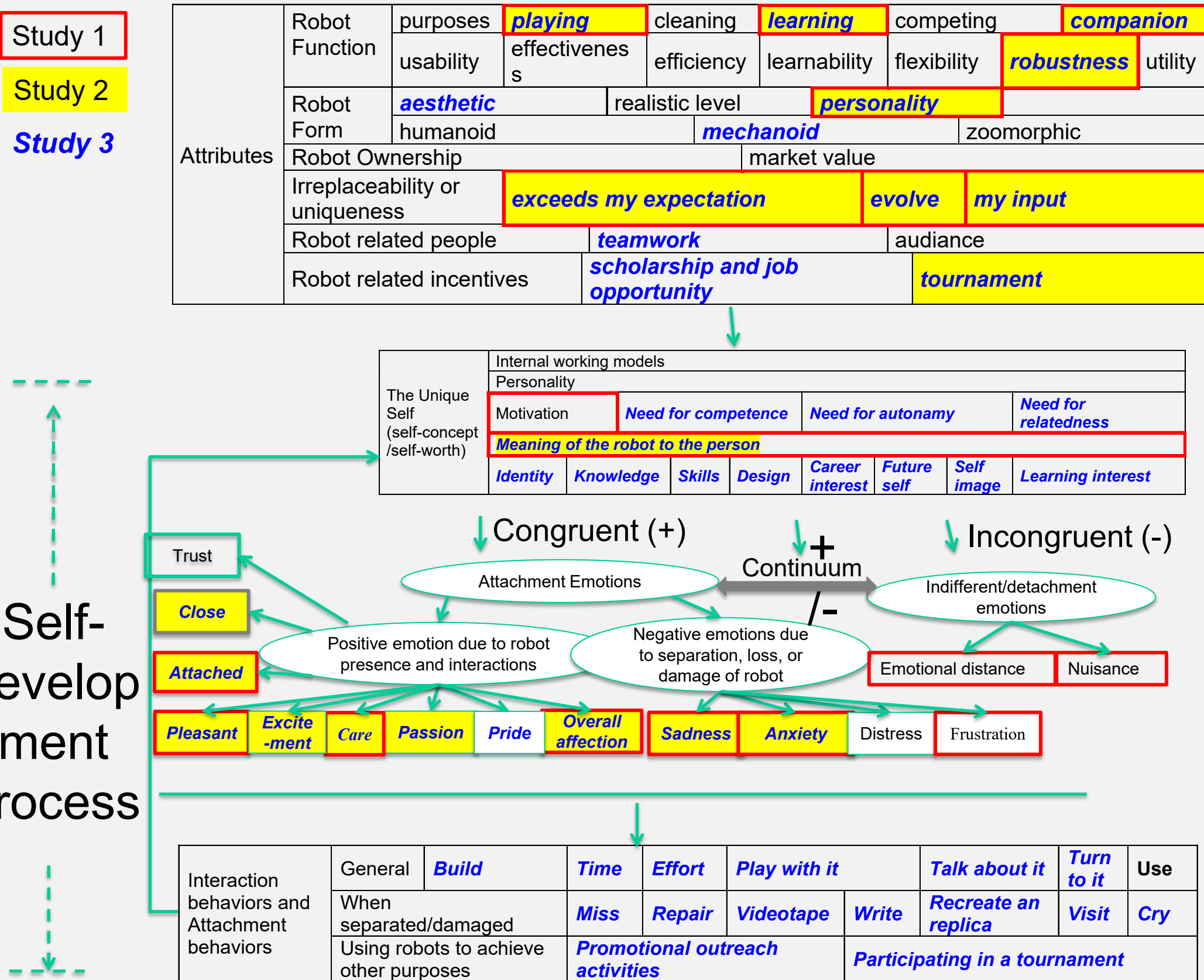
1. Well-being: Goal of HAI Co-evolution

- Psychological well-being—emphasizing personal growth, purpose, mastery, autonomy—grounded in the development of self-concept and manifested through emotional attachment to entities encountered in daily life, including AI
- Generalized human emotional attachment model (GHEA)—congruence of entity attributes with self-concept



2. Human Emotional Attachment Model

- Applying the GHEA scale in HRI with robotics tournaments builders

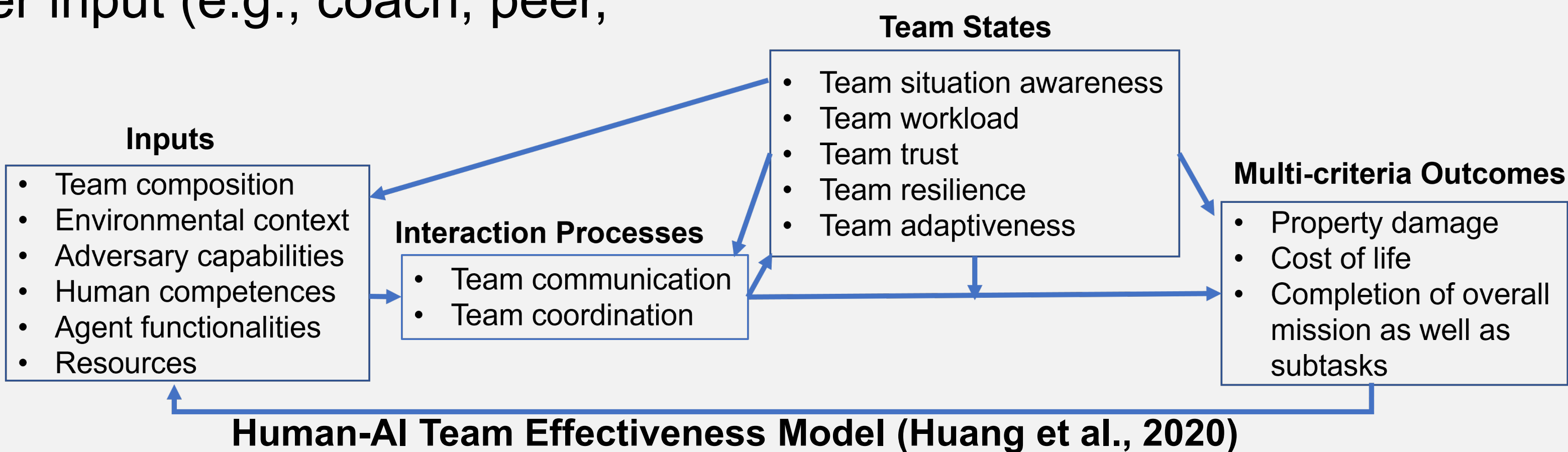


3. Human Evolution: Learn to team with AI

- GHEA is achieved through co-learning.
- Congruence evaluation requires learning about AI attributes.
- To achieve calibrated trust and optimal adaptability requires extensive training about AI in various situations.
- Use multimodal learning approaches for different stages.
- Training design/evaluation with multi-stakeholder input (e.g., coach, peer, engineer)

4. AI Evolution: Learn about Human

- AI learning about human challenges: data inefficiency, generalizability
- How can AI learning utilize small, well-designed, multi-modal human subject experiments to identify meaningful patterns? Including static (e.g., surveys) and dynamic (e.g., interactions) measures.
- How can AI use synthetic data to learn about human preferences, decision making, and behaviors?



5. Ethical Considerations

- Research on GHEA focuses on promoting psychological well-being and personal growth, rather than manipulating attachment for commercial gain.
- People’s preferences may not always align with what supports their psychological growth; self-concept evolves too.
- Unhealthy attachment should be treated appropriately (e.g., soldiers, “Her”).
- Interdisciplinary collaboration is required.

6. Future Directions

- The core of every design component: co-learning → self-concept congruence → attachment → well-being
- Test the model across various human–AI teaming domains with empirical data
- Use Human Factors methods to design high-quality features for human–AI teaming effectiveness research
- Use AI/ML methods to support deep mining and labor-intensive pattern recognition (e.g., communication and coordination)