EAWOP Small Group Meeting

Human-AI Teams at Work: Opportunity or Threat?

ACTIVITY REPORT

1. Event General Information

Date and Place: 25th-27th October 2023, University of Amsterdam, Netherlands

Organisers: Dr. Eleni Georganta (University of Amsterdam, Netherlands), Dr. Anna-Sophie Ulfert-Blank (Eindhoven University of Technology, Netherlands), Prof. Dr. Jan Schmutz (University of Zurich, Switzerland), Sophie Kerstan (ETH Zurich, Switzerland)

Participants overview: 27 participants, from 20 different universities, and from 6 European countries (Denmark, France, Germany, Netherlands, Portugal, Switzerland), Canada and USA.

1.1 Program Overview and Course of the Meeting

The EAWOP Small Group Meeting (SGM) in Amsterdam provided a platform for researchers and experts to delve into the intricate dimensions of human-AI teaming. The main objective was to present and discuss the latest research insights and challenges in various formats, from paper presentations to small group workshops. A comprehensive understanding of the abstracts in advance was encouraged, ensuring that presenters could focus on the pivotal aspects of their research during the event. The SGM included a keynote speech from Isabella Seeber, paper presentations where authors provided insights into their current research, and workshops discussing current challenges and how to move the field forward. In the following, we provide detailed information about the sessions.

Keynote "Machines as Teammates: Building bridges for meaningful human-AI teaming" by Prof. Dr. Isabella Seeber

In her enlightening keynote, Prof. Dr. Isabella Seeber delved into the concept of "Machines as Teammates" with a focus on building bridges across disciplines for purposeful human-AI teaming. She highlighted that machine teammates, which are AI-driven conversational agents, possess distinct features like heightened task autonomy and learning capabilities, setting them apart from conventional collaboration systems. Prof. Seeber pointed out the fragmentation of current research on machine teammates across varied disciplines and the absence of concrete application contexts. Additionally, she emphasised the deficiency of cohesive theories that can unify these diverse research segments. She raised critical questions about the adequacy of current research approaches in addressing vital societal concerns, particularly decent work conditions. Drawing from observed trends, such as apprehensions towards AI-enabled agents, over-reliance on them, overlooking algorithmic biases, and unwarranted task delegation, she expressed reservations. Prof. Seeber introduced some notable Information Systems concepts and theories related to human-AI teamwork, sharing insights from her research. She underscored the urgency for innovative theories on human-AI teamwork and advocated for bolder methodological strategies that foster profound theorization. Without such unifying theories, Prof. Seeber cautioned that we risk diminishing our potential contribution to the pivotal societal dialogues on human-AI partnerships.

Paper Presentations (Plenary Sessions)

During the SGM, participants were immersed in four paper presentation sessions: (1) *Perceptions of and reactions to AI teammates,* (2) *Collaboration, processes and dynamics,* (3) *AI teammate characteristics, capabilities and roles*, (4) *General frameworks and future perspectives on human-AI teams*. The 21 paper presentations spanned a diverse array of topics, from the intricacies of decision making within human-AI teams and the dynamics of trust, to the integration challenges and evolving roles of AI in the modern workplace. Additionally, some sessions provided comprehensive reviews and proposed frameworks in the realm of AI teaming. These presentations not only shed light on the latest research findings but also served as a catalyst for stimulating and insightful discussions among attendees.

Workshops (Small Groups)

During the SGM, participants formed into four distinct small groups, each dedicated to delving deeper into specific aspects of human-AI teaming. One group examined the core characteristics that AI teammates should embody to be effective collaborators. Another focused on unravelling the subtle dynamics that come into play when humans and AI work in tandem. Methodological approaches formed the crux of discussions in the third group, emphasising the need for robust practices in studying AI teaming. The final group engaged in critical discourse about the design principles for AI systems and the challenges in implementing them. Across these groups, there was a consensus on assessing the current research landscape, identifying pressing challenges, and charting out short to long-term strategies. These collective insights are poised to shape two forthcoming position papers intended for the European Journal of Work and Organisational Psychology.

2. Short Description of the SGM Topic Discussion

2.1 Main Conclusions and Lessons Learned

In conclusion to the SGM, participants collaboratively synthesised insights and discussions, focusing on shaping the future vision of Human-AI Teaming (HAT) research, particularly within the realm of work and organisational psychology. A central theme emerged—advocating for an ethical trajectory in HAT research that prioritises worker wellbeing and meaningfulness. The discussions highlighted a collective call for a stronger emphasis on human outcomes such as learning, development, engagement, and satisfaction, transcending conventional performance metrics.

As an overarching goal, participants highlighted the commitment to **a holistic, interdisciplinary and ethical approach in the evolving landscape of HAT research**. This overarching goal was underpinned by several critical challenges that were identified and thoroughly discussed during the conference.

- Validity and Generalizability: Participants highlighted the challenge of ensuring the validity and generalizability of research findings in the context of HAT interactions. Establishing the reliability of results and their applicability across diverse scenarios emerged as a key concern.
- Transfer Dynamics: Understanding and managing the transfer of knowledge and insights within HAT interactions was identified as a complex challenge. The nuances of how experiences and learnings in one context can be effectively applied to others within the realm of HAT were explored.
- Researching Non-Existing Entities: The unique challenge of conducting research on entities or phenomena that do not yet exist posed intriguing questions. Participants grappled with methodological approaches and ethical considerations associated with exploring the unknown in the rapidly evolving field of HAT.
- Temporal Variability in Human Reactions: Acknowledging the temporal aspect of human reactions, particularly the evolution of responses over time, emerged as a distinctive challenge. Anticipating and accounting for changes in human behaviour and attitudes towards AI and technology was deemed crucial.
- Research Latency: The SGM highlighted the challenge of research latency, emphasising the need for research outputs to remain relevant in a rapidly advancing technological landscape. Strategies to minimise the time gap between research findings and their application were discussed.
- Lack of Standardised Measures: The absence of meaningful and standardised measures, tasks, and paradigms for evaluating HAT interactions was identified as a hindrance. Participants emphasised the need for developing universally accepted metrics to gauge the impact of AI on human wellbeing and learning.
- Interdisciplinarity and Communication: The interdisciplinary nature of HAT research introduced challenges related to common language, definitions, and methods. Bridging these gaps in communication was identified as essential for fostering collaborative and effective research in the field.
- Complexity of AI-Teams: Managing the intricate dynamics within AI-teams, including their composition, size, and configurations, posed multifaceted challenges. The conference discussions delved into the complexities of human-AI and human-human-AI interactions and the implications for ethical considerations.

The participants underscored the need for acknowledging and addressing these challenges to advance the understanding and application of AI technologies in ways that prioritise human wellbeing, learning, and development within organisational teams.

2.2 Contributions to a Research Agenda

During the SGM, the following propositions were discussed as strategic guidelines for advancing HAT research, ensuring a more collaborative, methodologically robust, and contextually relevant approach. These propositions underscore the necessity of integrating perspectives from work and organisational psychology with those of other disciplines (e.g. computer science) to address the broader implications of HAT within organisational settings.

- Collaborative Language and Methods: A call for a shared language, terminology, and methods fosters collaboration and enhances communication across the multidisciplinary landscape of HAT research. This proposition encourages researchers to work collectively, ensuring a unified approach to studying human-AI interactions.
- Emphasis on Research Design: A stronger focus on research design is proposed to enhance the rigour and validity of HAT studies. This proposition underscores the importance of methodological precision, emphasising the need for robust experimental frameworks to yield reliable results.
- Standardisation in Research Methods: Standardising research practices in HAT is crucial for creating a cohesive and comparable body of knowledge. This proposition advocates for consistency in research methodologies to facilitate more effective cross-study comparisons and a clearer understanding of the field's intricacies.
- Development of Task-Sharing Platforms: The suggestion to develop platforms for sharing tasks used in HAT research aims to promote transparency and collaboration. By facilitating the exchange of study tasks, researchers can build upon existing work, accelerating progress and avoiding redundancy.
- Dynamic Interaction Studies: The call for more studies focusing on dynamic interactions between humans and AI addresses the need for a deeper understanding of the evolving nature of collaboration. This proposition encourages researchers to explore real-time, context-dependent interactions to capture the complexity of HAT scenarios.
- Real-world Case Studies: The emphasis on real-world case studies centred around teams aims to bridge the gap between controlled experiments and practical applications. This proposition encourages researchers to study HAT in authentic team settings, providing insights that are more directly applicable to real-world scenarios.
- Focus on Actual Teams: Shifting the focus from one-on-one interactions to actual teams recognizes the importance of studying HAT within the context of collective human efforts. This proposition calls for research that reflects the complexities of team dynamics, acknowledging the role of AI in collaborative group settings.

3. Meeting Implications and Outcomes

The outcomes of the SGM are substantial, marked by the initiation **of two position papers**. The first paper will delve into the fundamental processes distinguishing human-AI teams, offering forward-looking suggestions to propel the field. Simultaneously, the second position paper will address prevailing challenges in researching this topic, proposing innovative methodologies and recommendations for ongoing exploration. All participants will be co-authors in both position papers. Our goal is to submit the two position papers by September 2023 at the European Journal of Work and Organisational Psychology.

In addition, the meeting facilitated the establishment of a **robust interdisciplinary network** across various universities. This collaborative network, initiated through the creation of a private LinkedIn group for all participants, serves as a platform to amalgamate strengths and share knowledge. It promotes continued collaboration, ensuring a multifaceted approach to advancing our understanding of human-AI interactions. The strengthened connections and diverse expertise across academia provide a solid foundation for sustained collaborative efforts in this evolving field.

During the closing session of the SGM, participants actively synthesised the multitude of insights and discussions from the conference. A central focus was to outline the **vision for human-AI teaming research**, particularly from the perspective of work and organisational psychology. The overarching goal was to chart an ethical trajectory for Human-AI Teaming (HAT) research, considering both its potential benefits and associated risks. Key points of emphasis included exploring the ethical dimensions of HAT research and determining the future direction of the field. In this regard, a consensus emerged regarding the necessity for a more pronounced focus on the wellbeing and meaningfulness of workers. Participants advocated for a stronger stance on human wellbeing outcomes, encompassing aspects such as learning, development, engagement, and satisfaction—not merely limited to performance metrics. This nuanced perspective underscored the importance of fostering a workplace environment that prioritises the holistic experiences and growth of individuals within the context of human-AI collaboration. The discussions aimed to set a comprehensive and ethical foundation for the ongoing exploration of HAT research, steering it towards a future that is not only technologically advanced but also considerate of the human element.

As an additional outcome, we **envision informing companies and policy makers about the future of HAT**, inviting them to collaborate in shaping this evolving field. Furthermore, we want to be recognized as important and valuable by industry and other disciplines within the domain of HAT. We acknowledge our unique position as experts in studying teams, offering insights into dynamics, wellbeing, scaling of interaction, and how human teams operate within organisational structures. Leveraging our research strengths in measurement and understanding work processes, we are poised to contribute to the future development of HAT. This makes us a sought-after resource for those seeking valuable perspectives on the complex interplay between humans and AI.

5. SGM Evaluation

5.1 Self-Assessment of the SGM Organising Committee

Our approach to organising the SGM involved meticulous pre-conference planning and the establishment of clear role assignments within the organisational team. This foundation facilitated the seamless management of the event. The organisational team's demonstrated flexibility and active engagement played a crucial role in effectively navigating unforeseen changes during the meeting. Regular debriefings were a cornerstone of our organisational strategy. Conducted once or twice throughout the day and at the end of each official program day, these sessions enabled us to assess successes, identify challenges, and make necessary adjustments on the fly.

One notable adjustment involved merging four workshop groups into two after the initial round of work. Originally, the plan was for individual small group work until the final plenary presentation. The decision to merge workshop groups resulted in more consolidated discussion outputs and contributed to forming a comprehensive conclusion during the final presentation. Additionally, we redistributed some participants to different workshop groups when merging occurred. This decision, driven by the realisation that a few participants joined on the last day, aimed at optimising expertise and seniority distributions to enrich discussions within the groups for the upcoming round of workshop group work. These adaptive changes were well-received by SGM participants and were deemed successful during the final debriefing within the organisational team after the conference concluded.

The collaborative spirit, open communication, and willingness to adjust strategies in response to real-time feedback were key elements that contributed to the overall success of the conference organisation.

5.2 Participants Assessment of the SGM

Participants provided positive feedback on the conference, highlighting the effectiveness of short presentations in facilitating more discussions. They appreciated the absence of hierarchies, noting the fair treatment among attendees. The creation of a LinkedIn group was suggested. The conference was praised for incorporating different perspectives and disciplines, fostering an empowering and open atmosphere. Participants enjoyed group discussion opportunities and commended the quality of food. However, there was a suggestion for improvement in the presentation sessions, indicating a need for more time for discussion.

6. Appendix

--- Final Booklet (including detailed program and final abstracts)

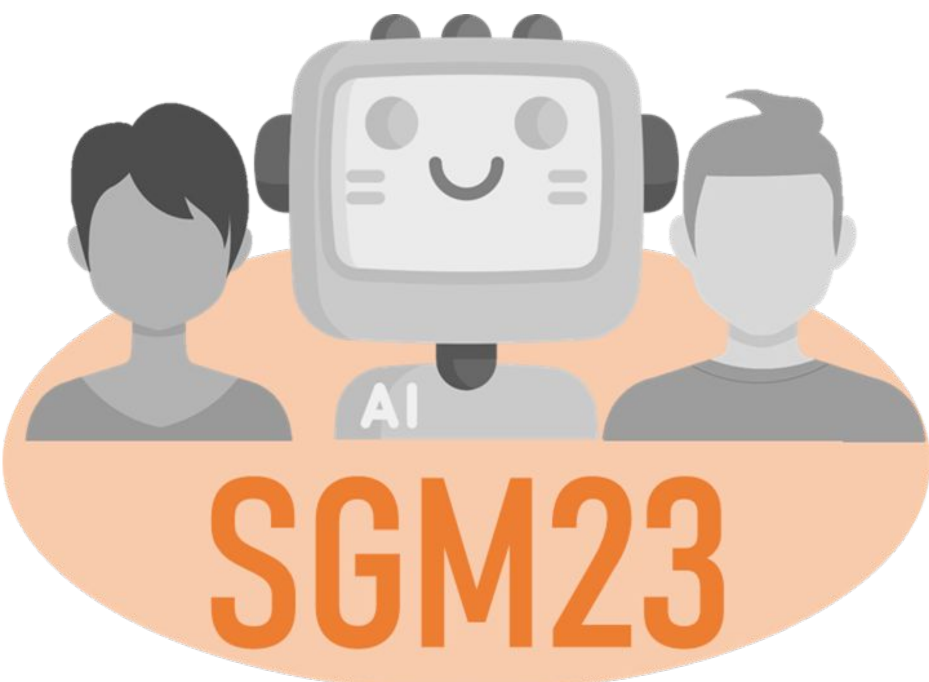
--- List of participants (including the Affiliation/Country)

European Association of Work and Organizational Psychology

Human-AI Teams at Work: Opportunity or Threat?

EAWOP Small Group Meeting

25th-27th October 2023, University of Amsterdam



Programme booklet version 3.0 (23rd October 2023)

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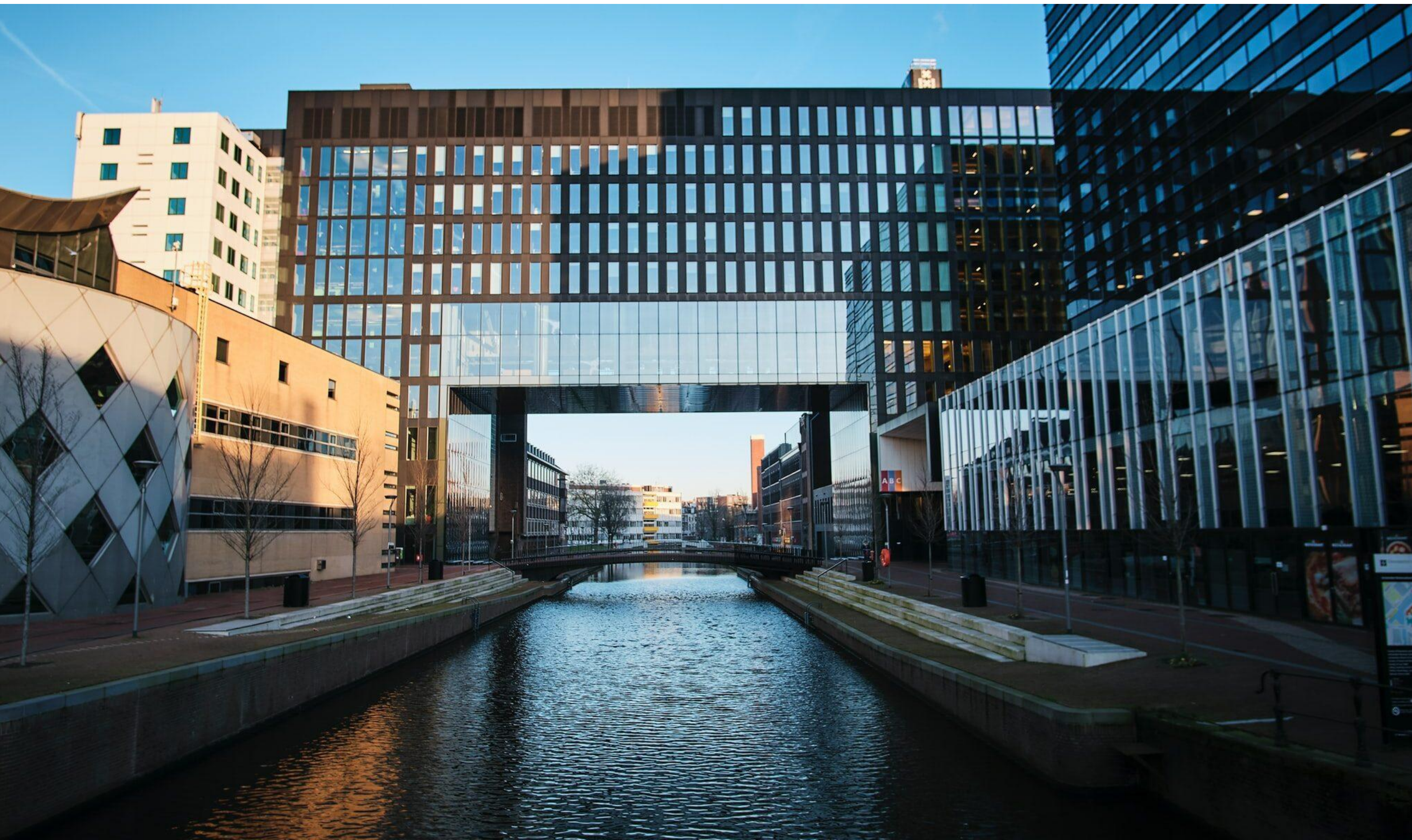


Dear SGM participants,

Welcome to the EAWOP Small Group Meeting *"Human-AI Teams at Work: Opportunity or Threat?".* As technology continues to advance, the integration of Artificial Intelligence (AI) in the workplace has become a reality. The collaboration between humans and AI systems presents unprecedented opportunities for enhancing productivity, automating tasks, and unlocking new frontiers of innovation.

In this event, we gather experts, thought leaders, and enthusiasts from diverse fields to explore the intricacies of human-AI collaboration, delve into success stories, address potential challenges, and collectively envision a future where humans and AI coexist and collaborate in work teams.

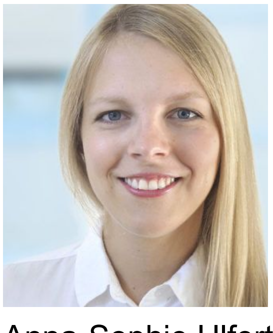
Join us for insightful discussions, engaging sessions, and an inspiring exchange of ideas that will shape the way we perceive and navigate the evolving landscape of human-AI teams at work.

In this booklet, you will find instructions for the SGM, including the schedule, a list of participants and presentations, relevant links and presenter instructions. We are excited for your input and many discussions!

Your organizing committee

Eleni Georganta
University of Amsterdam, Netherlands

Sophie Kerstan
ETH Zurich, Switzerland



Anna-Sophie Ulfert-Blank
Eindhoven University of Technology, Netherlands

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Acknowledgements

We would like to thank everyone who played a vital role in making this Small Group Meeting possible.

First and foremost, we extend our sincere thanks to the **European Association of Work and Organizational Psychology (EAWOP)** for recognizing the significance of human-AI teamwork, for approving our proposal, and for providing us with the resources that allowed us to transform the Small Group Meeting into a reality.

Furthermore, we would like to thank **Prof. Dr. Astrid Homan** for her unwavering support and for granting us the opportunity to host the Small Group Meeting at the University of Amsterdam. Her help was invaluable in bringing this event to fruition.

Our appreciation also goes out to **Jeannette van den Akker**, whose organizational skills and positive energy helped us overcome various challenges and make steady progress. Her ability to find solutions was instrumental in our preparations.

We would also like to thank **Anna Christopoulou** for her volunteer work in assisting us with different tasks leading up to and during the SGM in Amsterdam.

Last but not least, we extend our thanks to our keynote speaker **Prof. Dr. Isabella Seeber** and to **all the participants**, who contributed their outstanding work, travelled to Amsterdam, and dedicated their time to engage with us and each other on this important research topic. Your presence and involvement are the key factors in making the conference a resounding success.

During the SGM we will present and discuss research in different forms.

Paper presentations (plenary sessions)

Four paper sessions will take place. The abstracts of all presentations can be found in this booklet. Please read the abstracts beforehand so that the presenters can focus on the main points of their work.

In the participant list (p. 10-11), you can see during which session you will be presenting your research. Please prepare a **5 min presentation** of your research. We encourage presenters to use a maximum of **five slides**. A ~5 min discussion will follow each presentation.

Workshops (small groups)

During the SGM, you will be working in four small groups. Each small group will discuss one of the following topics: (1) characteristics of AI teammates, (2) mechanisms during human-AI team collaboration, (3) methodologies, (4) design and implementation. You can select your topic during the registration on Wednesday.

In each of these small groups, the following points will be discussed:

a) the current state of research
b) the current challenges and what we need to address them
c) specific short-term, medium-, and long-term action steps to move the field forward

The results of the workshops will inform a position paper about human-AI teams that will be submitted to the European Journal of Work and Organizational Psychology.

Wednesday, Oct. 25th		Location
15:00-15.45	**Registration**	G2.02
16:00-18:00	**Opening Ceremony & Borrel** • Introduction & welcome	G2.01 CREA

	Thursday, Oct. 26th	Location
09:00-10:30	**Keynote Isabella Seeber** (including open discussion)	GS.11
10:30-11:00	*Coffee break*	GS.34
11:00-12:15	**Paper presentations 1** (plenary) *Perceptions of and reactions to AI teammates*	G2.01
12:15-13:15	*Lunch break*	
13:15-14:30	**Paper presentations 2** (plenary) *Collaboration, processes and dynamics*	G2.01
14:30-15:00	*Coffee break*	GS.34
15:00-17:30	**Workshop part 1** (small groups) • Working in small groups on different topics • Exchange ideas and discuss	GS.01 GS.02 GS.08 GS.09
18:30	**Conference dinner**	ZOKU

	Friday, Oct. 27th	Location
09:00-10:00	**Paper presentations 3** (plenary) *AI teammate characteristics, capabilities and roles*	GS.11
10:00-10:15	*Short break*	
10:15-11:00	**Paper presentations 4** (plenary) *General frameworks and future perspectives on human-AI teams*	GS.11
11:00-11:30	*Coffee break*	
11:30-12:30	**Workshop part 2** (small groups) • Continuation of discussions • Prepare the “product” for the whole group	GS.04 GS.05 GS.07 GS.09
12:30-13:30	*Lunch break*	
13:30-14:30	**Workshop part 3** (small groups) • Continuation of discussions • Prepare the “product” for the whole group	GS.04 GS.05 GS.07 GS.09
14:30-15:00	*Coffee break*	
15:00-16:30	**Presentation of conclusions from small group discussions** (plenary) • 10 min presentation + 10 min discussion per group	G2.01
16:30-17:30	Summary and discussion of next steps in the field, **Closing**	G2.01
18:15	**Optional dinner**	De Plantage

Isabella Seeber is an Associate Professor in the department of Management, Technologies and Strategy of Grenoble Ecole de Management in France. She holds a doctorate from the University of Innsbruck, Austria. Isabella's research focuses on AI-based conversational agents in team collaboration, team and crowd-based innovation, and digital nudging.

She has published amongst others in Journal of Management Information Systems, Decision Support Systems, Information & Management, or Computers in Human Behavior.

Keynote

Machines as Teammates:
Building bridges for meaningful human-AI teaming

Machine teammates are AI-enabled conversational agents that differ from traditional collaboration systems as they have amongst others more task autonomy or the ability to learn. The current research on machine teammates is fragmented across different research fields and often lacks a concrete application context. We also lack theories that could bring the research streams together and thus allow to build bridges for effective knowledge flows.

Furthermore, it is worth questioning whether our current research endeavours are sufficiently equipped to address urgent societal challenges, such as ensuring decent working conditions. This scepticism arises from observed trends, including the fear of AI-enabled conversational agents, excessive reliance on them during task execution, failure to recognize algorithmic biases negatively impacting decision-making, and the delegation of tasks to machine teammates that require human judgment.

By introducing some of the most prominent Information Systems concepts and theories surrounding human-AI teamwork and giving insights into my own ongoing research activities, this presentation aims at highlighting the need for new theories on human-AI teamwork and more daring methodological approaches that enable rich theorizing. Without bridging theories, we reduce our chance to contribute effectively to the critical societal discourse surrounding human-AI collaboration.

Participant	Paper	Session*
Monika Westphal University of Cologne	Increasing the effectiveness of human-AI teams: The role of decision control and explanations	Session 1 (Abstract p. 12)
Wolter Pieters Radboud University	Active bystanders for technology: Artificial intelligence, advice, and responsibility	Session 1 (Abstract p. 13)
Mira Kaut Technical University Munich	What do we want in our AI teammates? Examining expectations in human-AI teams	Session 1 (Abstract p. 14)
Sophie Kerstan ETH Zurich	Expectations in human-AI teams: A framework	Session 1 (Abstract p. 15)
Dijana Aleksic Rotterdam School of Management	How to win friends and influence people...as a chatbot: Chatbot interaction and work motivation	Session 1 (Abstract p. 16)
Thomas Ellwart Trier University	Is it me or is it us? Effect of agents‘ levels of autonomy on the perception of being a team	Session 1 (Abstract p. 17)
Carolina Centeio Jorge Delft University of Technology	Mutual understanding and trust in human-AI teams	Session 2 (Abstract p. 18)
Brandon Kang University of Georgia	An agent architecture to simulate human-AI trust dynamics	Session 2 (Abstract p. 19)
Catarina M. Santos Maastricht University	Thriving in human-AI teams: Exploring critical team compositions, processes, and outcomes	Session 2 (Abstract p. 20)
Rebecca Müller Eindhoven University of Technology	Dear agent, are we on the same page? Consequences of shared mental models between humans and agents	Session 2 (Abstract p. 21)
Tilman Nols Eindhoven University of Technology	Supporting coordination in human-AI teams: A conceptual framework	Session 2 (Abstract p. 22)
Astrid Galsgaard University of Copenhagen	Challenges and transformations in the human sense of agency in professional interactions with artificial intelligence	Session 2 (Abstract p. 23)

*Session 1: *Perceptions of and reactions to AI teammates*
Session 2: *Collaboration, processes and dynamics*

Participant	Paper	Session*
Agata Mirowska NEOMA Business School	The A(I) team? The effects of realism and gender on willingness to work with a virtual teammate	Session 3 (Abstract p. 24)
Leslie DeChurch Northwestern University	The signatures of success in human-agent teams	Session 3 (Abstract p. 25)
Klara Grünwald University of Regensburg	Don't you tell me what to do, you are just an artificial intelligence! – Perception, evaluation and motivational function of AI-assisted feedback	Session 3 (Abstract p. 26)
Dominik Walzner University of Cologne	Roles of AI in collaboration with humans – Automation, augmentation and the future of work [*presentation cancelled*]	Session 3 (Abstract p. 27)
Leslie DeChurch Northwestern University	Just one the team: AI acceptance in team decision-making	Session 3 (Abstract p. 28)
Rui Prada Universidade de Lisboa	Where is the "we" in human-AI teams?: Building a model for human-agent team dynamics research	Session 4 (Abstract p. 29)
Patrícia Costa Instituto Universitário de Lisboa	Human-AI teaming literature clusters: Finding a team in a paper stack?	Session 4 (Abstract p. 30)
Raquel Salcedo Gil Eindhoven University of Technology	Training human-robot teams: A scoping review and theoretical framework	Session 4 (Abstract p. 31)
Thomas A. O'Neill University of Calgary	Human-autonomy teaming: Observations about the state of the science	Session 4 (Abstract p. 32)

*Session 3: *AI teammate characteristics, capabilities and roles*
Session 4: *General frameworks and future perspectives on human-AI teams*

Title

Increasing the effectiveness of human-AI teams: The role of decision control and explanations

Authors, *presenter*

Monika Westphal, Michael Vössing, Gerhard Satzger, Galit B. Yom-Tov, Anat Rafaeli

The capabilities of artificial intelligence (AI) are continuously increasing. This raises questions about people's willingness to trust and rely on these systems. Significant effort has been invested to develop techniques that improve the effectiveness of human-AI teams. In this work, we study how users perceive and to what extent they comply with AI recommendations; we either equip them with decision control (i.e., the extent to which they can modify the AI recommendation) or provide an explanation (i.e., detailing how the AI came up with the recommendation).

While previous research consistently shows a positive effect of decision control on team effectiveness, we learn that providing explanations to users often does not yield the desired team outcomes. These inconclusive findings likely occur because of influencing factors that have not yet been considered. Drawing on cognitive load theory, we propose that providing explanations increases perceived task complexity, in turn hampering team effectiveness. We also examine whether users' cognitive ability can help compensate for this negative effect.

In three experimental studies, we recruited 548 participants on Prolific and asked them (in the role of hotel managers) to determine the prices they should charge for a double room of different hotels, based on the hotels' characteristics (e.g., distance to the city center, customer reviews) and the average room price in the city. Based on data from over 40.000 hotels on booking.com, we trained an AI using XGBoost and neural networks. This AI then recommended a room price for the same hotels, and participants decided if they wanted to change their initial estimations.

We measured user compliance with the AI recommendation (i.e., the relative change in the accuracy of the room price estimations, from initial to updated). As the AI was highly accurate, participants' compliance reflected effectiveness of the team. Participants rated their perceptions (of trust and understanding), and their intention to comply with the AI recommendation on validated Likert scales. Lastly, participants had to pass manipulation checks and reported their gender, age, education, as well as their work experience in hospitality and revenue management and with revenue management software. These controls were included in all analyses.

We find that high decision control improves participants' perceptions (of trust and understanding), as well as their intended and actual compliance with the AI recommendation, compared to low decision control. In contrast, we find that, instead of improving team effectiveness, providing an explanation increased perceived task complexity, hampering perceptions and compliance. Still, users' cognitive ability buffered some of these negative effects; for users with high cognitive abilities perceptions of understanding and actual compliance improved.

In sum, our study shows that human-AI teams generally benefit from enhancing users' decision control, but from providing an explanation for the AI's rationale only if it fits the cognitive abilities of the specific user. This work highlights the benefit of integrating human-computer interaction (HCI) literature with cognitive load theory, to address the complexity of human-AI teams. Our findings have important implications for designing AI team mates in the light of team effectiveness.

Title

Active bystanders for technology: Artificial intelligence, advice, and responsibility

Author, *presenter*

Wolter Pieters

When artificial intelligence (AI) is introduced in decision-making processes, there is a concern that systems make “bad” decisions (Buijsman & Veluwenkamp, 2022) without humans being able to intervene. To facilitate intervention, notions such as human-in-the-loop and explainable AI have been proposed. However, these notions focus on technological features rather than actual practices (De Bruijn et al., 2022; Giest & Klievink, 2022). For example, if afraid of being held responsible when deviating from an AI’s advice, individuals or teams may follow the advice even if they are in the loop and have doubts about the proposed action. This behaviour is similar to the bystander effect in issues of social safety, where bystanders may not intervene because they are uncertain, fear the possible consequences, or think others will act first.

There is limited attention for how practices of joint decision-making between humans and AI take shape based on the social psychology of responsibility (Adensamer et al., 2021). To fill this gap around responsibility practices (Noorman, 2014), I introduce a research agenda building on the notions of active bystandership (Coker et al., 2011) and felt responsibility (Fuller at al., 2006). The concept of “active bystander” aims to make people more confident in acting when they observe undesirable behaviour, so that they can prevent problematic outcomes. In this theoretical contribution, I investigate its usefulness in the context of wrong or problematic advice by AI (Van de Voort et al., 2015), in particular in hybrid teams.

The study connects literature on active bystandership, felt responsibility, and the role of advice in decision making, with the purpose of identifying similarities and differences between active bystandership in human versus hybrid teams. Informed by my background in computer science and ethics (Pieters, 2011) as well as my current position in psychology, I identify knowledge gaps and suitable study designs to fill those gaps.

Based on the literature, I highlight similarities and differences between the two contexts of active bystandership and the role of felt responsibility. I outline a research agenda and promising study designs, including effects of information source (Formosa et al., 2022) and framing of the advice (Langer et al., 2022) on decisions and subjective experience (including felt responsibility). Student projects suggest that (a) the difference in intention to follow advice between a human and AI advisor may depend on the advice context, and (b) that more responsibility for the decision is attributed to oneself rather than the advisor in case the advisor is an AI.

The current contribution is theoretical. I am planning further student projects to follow up on the initial empirical results. This work invites organisations to consider whether employees / teams are encouraged and feel comfortable to speak up against undesirable behaviour or bad advice by AI in human-AI teams, as part of a broader culture of voicing behaviour and active bystandership. The research agenda, with a focus on properties of advice and felt responsibility as key factors, should lead to tools that organisations can employ to facilitate such behaviour.

Title

What do we want in our AI teammates? Examining expectations in human-AI teams

Authors, *presenter*

Mira Kaut, Eleni Georganta, Ervina Hakaj, Claudia Peus

The integration of artificial intelligence (AI) into the workplace is rapidly growing, and the status of AI is changing from a tool to a team member. Nevertheless, little is known about what humans at work expect an AI teammate to be.

Expectation States Theory and Implicit Leadership Theory show that in human contexts, expectations play a significant role in the workplace. Previous work has also indicated that expectations towards AI teammates can be unrealistically high. Building on this previous theoretical and empirical work, the goal of the present study is to examine whether expectations towards AI- and human teammates differ, specifically, whether team member characteristics are valued differently between human and AI teammates.

Using a within-subjects design, we conducted two online studies (N1 = 102; N2 = 116), where we asked participants to rate the importance of team member characteristics (e.g., benevolence, competence, reliability) for a new human or AI team member. The characteristics are derived from the human team and AI collaboration literature.

The characteristics were rated in terms of their importance, and to quantify the characteristic's importance compared to other characteristics, participants were also asked to allocate tokens to (N1= 102) or rank (N2 = 116) each characteristic.

Differences between human and AI teammates were analyzed using Wilcoxon-Signed-Ranks-Tests. Additionally, a K-Means-Cluster-Analysis was used to further analyze the importance data, and a Plackett Luce Model (PLM) was fitted on the ranking data. The PLM revealed that Competency was the highest-ranked characteristic for both AI and humans, while there was a difference in preferences for all other characteristics. The clustering analysis revealed patterns that were different from what we would expect from the literature.

Although the study provides first empirical insights into expectations towards AI teammates, it has some limitations. The description of the AI was rather general, and participants might differ excessively in how they imagine an AI teammate to be. Furthermore, there might be additional essential characteristics that we did not investigate.

With our study, we highlight the importance of understanding the differences in expectations towards human versus AI teammates and how we are measuring expectations. We hope that our results can shine a light on processes that happen before employees interact with a new teammate and, in further studies, explore how we use this information to make the introduction of a new (AI) teammate easier and enjoyable for all parties.

Title

Expectation in human-AI teams: A framework

Authors, *presenter*

Sophie Kerstan, Jan B. Schmutz, Gudela Grote

Based on the growing capabilities of AI, researchers and practitioners are increasingly discussing the implementation of AI as a team member. Initial research shows that people hold a multitude of expectations, i.e., future-oriented beliefs, toward AI team members. However, it is unclear what impact these expectations have on interactions in human-AI teams. Decades of psychological research point to the central role of expectations for human behavior more broadly. Based on this research, we investigate how expectations toward AI team members affect collaboration in human-AI teams.

Recent reviews of the human-AI teaming literature characterize its current state of theory development as nascent and criticize seemingly unsystematic investigations of isolated constructs and effects. We develop a framework of AI-related expectations and their effects on collaboration in human-AI teams to address this issue. In doing so, we help build a much-needed, sound theoretical foundation for future human-AI team research.

We review and integrate research on AI-related expectations and the impact of expectations on human behavior more broadly. Our review incorporates studies from various sub-disciplines of psychology (e.g., cognitive and social psychology) and research from other scientific disciplines (e.g., management, information systems, human-computer interaction).

Based on our literature synthesis, we postulate a framework that describes how AI-related expectations affect interactions in human-AI teams. Specifically, this framework captures how expectation types (e.g., anticipatory or normative), levels of expectations (individual, team), and the confirmation or refutation of expectations influence processes and outcomes in human-AI teams.

The framework is partly based on research conducted in contexts that do not incorporate AI (e.g., studies including only humans). Thus, future research should test the proposed relationships in domain-specific empirical studies that include elements of human-AI interaction.

Our literature synthesis indicates that expectations towards AI team members play a prevalent role in human-AI interactions. We propose specific mechanisms of how AI-related expectations influence interactions and outcomes in human-AI teams and hope to inspire future research to incorporate the underlying theoretical considerations of our framework into their research. Specifically, the framework can assist researchers who empirically investigate relationships between AI-oriented expectations, processes, and outcomes in forming theoretically grounded hypotheses regarding the nature of these relationships. Additionally, based on our framework, we offer recommendations for practitioners (AI-developers, managers, employees working with AI-team members), who wish to actively address and manage AI-related expectations to foster safe and effective human-AI teamwork.

Title

How to win friends and influence people...as a chatbot: Chatbot interaction and work motivation

Authors, *presenter*

Dijana Aleksic, Rebecca Hewett, Steffen Giessner

Chatbots, AI computer programs that interact with users using natural language and often have social capabilities (Chaves & Gerosa, 2018), have advanced rapidly in recent times. Until not long ago, human-chatbot interaction was relatively superficial, yet often a rewarding experience (Skjuve et al., 2021). With the rise of advanced chatbot capabilities using Large Language Models (LLP), like OpenAI's ChatGPT which counts 1.4 billion monthly visitors (Similarweb.com, 2023), the interest for and the potential of dialogic technology is rapidly advancing. Additionally, computer interaction via dialogue contributes to human-likeness, or anthropomorphism (Epley et al., 2008), and research shows that anthropomorphizing computers leads to experiencing them as social actors (Reeves & Nass, 1996) and even as part of the team (Nass & Moon, 2000).

Our investigation of employee interaction with chatbots took place in the context of digital HRM (e-HRM), widely used in organizations. Chatbots, alongside other machine learning technologies, are expanding self-service capabilities and reshaping employee experience at work (Bersin, 2019). Chatbots can assist employees in their interaction with e-HRM through conversational dialogue, improving navigation compared to standard e-HRM, which require employees to learn the language and pattern of standard user interfaces (Kuang & Fabricant, 2019). To understand the implications of chatbot interactions for individuals' experience at work, we draw on self-determination theory, which posits that individuals have three basic psychological needs (autonomy, competence and relatedness) which, when satisfied, are conducive to enhanced wellbeing and performance (Ryan & Deci, 2000). While social interactions have an important role to play in satisfying these needs (Leroy et al., 2012), it is less clear how interactions with social technology may or may not.

We operationalized users' experience of chatbots through perceived usefulness and perceived ease of use (Venkatesh & Davis, 2000), and anthropomorphism through social presence (Gefen & Straub, 2003) on the basis that the design and implementation of technological functions that are perceived as useful and beneficial support the satisfaction of individuals' basic psychological needs (Peters et al., 2018). We adopted a quasi-experimental design, collecting data from three companies that recently introduced a chatbot assistant to their existing e-HRM system. The control group interacted with e-HRM via the standard menu only, while the experimental group used a chatbot interface. The chatbot user group reported heightened feelings of autonomy, competence, and relatedness, compared to the group using the standard menu alone. Our findings also indicate a positive relationship between perceived usefulness and ease of use and feelings of autonomy, competence, and relatedness. These findings suggest that task fulfillment in e-HRM via a chatbot is associated with increased basic need satisfaction which contributes to improved employee performance and well-being (Van den Broeck et al., 2016). Social presence did not significantly moderate the relationship between perceived usefulness, perceived ease of use and basic need satisfaction. As companies increase investments in employee-facing chatbots, including fast-approaching usage and integration of ChatGPT, our research, applying the framework of basic psychological needs, provides valuable insights into how individuals respond to chatbot interaction.

Title

Is it me or is it us? Effect of agents‘ levels of autonomy on the perception of being a team

Authors, *presenter*

Rebecca Müller, Benedikt Graf, *Thomas Ellwart*, Conny H. Antoni

This study investigates the effects of three levels of autonomy (no, partial, high) on aspects characterizing a human-agent interaction as teamwork (i.e., task interdependence, members' role uniqueness, perceiving the agent as a mate rather than a tool, team identity). We hypothesize that the higher the agents' level of autonomy, the higher humans perceive the task interdependence (i.e., degree that outcomes are relied on one or all members), uniqueness of roles (i.e., degree of unique contribution of each member), the agent as a mate rather than a tool, and team identity (i.e., degree of emotional attachment to the team).

In a laboratory experiment, we used a computer-based simulation of a control-center, in which participants had three subtasks: 1) prioritizing emergencies, 2) processing emergencies, and 3) turning off occurring alarms. The manipulation of agents' level of autonomy was implemented in the second subtask. At no level of autonomy, the agent supported the humans' decision by highlighting one correct solution. Participants could decide whether they want to follow the suggestion or not. At the partial level of autonomy, the agent highlighted and selected one solution. Participants had 15 seconds to decide whether to veto the agents' decision, before the agent acted on its decision. At the high level of autonomy, the agent decided and acted autonomously, whereas participants could monitor the agents' actions. Participants had to prioritize the emergencies (subtask 1) and turn off the occurring alarms (subtask 3) by themselves in all levels of autonomy. The participants played the simulation four times for eight minutes with varying levels of autonomy (control vs. no. vs. partial vs. high level of autonomy) in a complete randomized order. After each level of autonomy, participants received a questionnaire including our dependent variables and open-ended questions regarding the perception of the agent as a mate or tool.

The manipulation check shows that with increasing level of autonomy, the perceived agents' agentic capability significantly increased. Results of repeated-measures ANOVAs showed that participants perceived significantly higher task interdependence, role uniqueness, agents as a mate, and team identity in partial compared to no level of autonomy. No differences between partial and high levels of autonomy were found. The assumption that the higher the agents' level of autonomy the more likely humans perceive them as a team can be partially supported.

Agents' level of autonomy is appropriate to describe agents features (i.e., agents' agentic capability) and to distinguish automation from autonomy. However, it is not able to distinguish partial from high levels of autonomy regarding aspects characterizing teamwork. Thus, agent autonomy might be not sufficient to perceive the human-agent interaction as teamwork. Qualitative results showed that other aspects (e.g., biliteral communication) are crucial for humans to perceive the agent more as a mate. The limitation of the study is a reduced external validation due to the experimental design, ad hoc teams, and student participants.

Title

Mutual understanding and trust in human-AI teams

Authors, *presenter*

Carolina Centeio Jorge, Ruben S. Verhagen, Myrthe L. Tielman

Humans and AI (Artificial Intelligence) systems will increasingly work together on complex tasks in work environments. For example, fire fighters in the Netherlands are already collaborating with explore and extinguish robots for areas and situations too dangerous for humans. These human-AI teams, i.e., teams composed of both humans and AI, create opportunities to assemble the best qualities of humans and AI systems in order to achieve goals more efficiently and avoid possible risks. This requires human-AI teams to ensure the 3 Cs - coordination, cooperation, and collaboration. However, these are not easy to achieve. We know from human-human teams that coordination, cooperation, and collaboration are only achievable through effective communication, shared mental models, and mutual trust. It is a challenge to implement these concepts in human-AI teams as we do not even know how they translate in such scenarios. In this presentation, we explain how we use organizational psychology theories to conduct experiments where we explore the design and implementation of AI systems that need to team up with humans. We will showcase our recent work on human- AI teamwork, focusing explicitly on how to (1) make AI systems understandable to humans and (2) allow AI systems to understand humans.

Our methods and experimental designs involve user studies on simulated two-dimensional grid environments allowing rapid manipulation of AI communication, collaboration design, interdependence relationships, and AI failure. Using these environments, together with questionnaires, we have studied (1) the relationship between team dynamics and AI communication, (2) AI reliance on humans using artificial trust, (3) personalized AI explanations, and (4) the relationship between AI failure and human trustworthiness. The scenarios used range from search and rescue to supermarket and moving out tasks, with different types of interdependence.

Results show that interdependencies between humans and AI systems determine the effects of AI communication on teamwork. In addition, results show how humans' willingness to do certain tasks does not only depend on benevolence and integrity, but also on contextual factors such as cost and benefits of actions. Our results also highlight that personalized AI explanations based on human user models can benefit human-AI teamwork. Finally, our studies show how AI failure negatively affects human trust in AI systems as well as humans' own trustworthiness (i.e., humans become less reliable teammates).

During our presentation we will also discuss several challenges and limitations of our methodology, such as the lack of ground truth for evaluation and ensuring ecological validity. On the other hand, we point out how our methodology can provide rapid empirical evidence that can be valuable for designing AI, e.g., robots in human-robot teams for firefighting. All in all, our results contribute to improving mutual understanding and trust in human-AI teams, necessary for leveraging the opportunities that these teams provide while mitigating potential risks.

Title

An agent architecture to simulate human-AI trust dynamics

Authors, *presenter*

Neal Outland, *Brandon Kang*, Sierra Stryker

Human trust is a critical factor that impacts human interactions and behaviors both macro and micro scales. Decades of psychological literature have examined the nature of human trust as it relates to human-human interaction. However, in recent years, work on trust as it relates to human interactions with artificial intelligence systems (AISs) has assumed a focal role. As AISs are developed for human collaboration, it is imperative to understand the dynamics of trust in a realistic framework as it unfolds over time. This will include, minimally, trust development and maintenance, while considering aspects of motivation, behavior, and performance (De Visser et al., 2019; Sheppard & Sherman, 1998). Without doing so, we may see negative implications (e.g., trust leading to over/under reliance or misuse) for human workers in human-AIS teams.

We developed a belief-desire-intention (BDI) cognitive architecture to computationally represent the known dynamics of trust within a unified framework (Bourgais et al., 2020). Figure 1 [*see Appendix, p. 33*] displays the process by which agents update their beliefs about the world, storing the information in their knowledge bases, before acting on the knowledge via a decision engine. Knowledge management represents the calculations to infer longer-stability perceptions such as trustworthiness. Finally, the decision engine plans actions based on the current state of beliefs and the agent's behavioral repertoire. Such a structure allows us to create realistic simulations of expected behaviors regarding trust-relevant affect, behavior and cognition. The development of this cognitive agent began with a systematic examination of trust dynamics theories informed the context in which trust may be relevant within team environments, the emotions and cognitions elicited by behaviors within the trust relationships, and the behavioral indicators associated with (dis)trust.

This agent architecture can be used to simulate any number of human or AIS agents. To demonstrate the efficacy of the cognitive agent, we simulated how human and AIS agents interacted and adapted their perceptions of trust over time. Specifically, we examined how: (1) individual differences and readily identifiable biodata influenced initial trust perceptions; (2) trust manifests as behavior during different team processes (e.g. transition vs action; Marks et al., 2001); (3) trust calibration occurs and influences behavior (e.g. asking for assurances; De Visser et al, 2019).

The architecture was used to simulate a dyadic military mission which required both agents to plan actions, coordinate, and enact specific behaviors in a manner similar to human teams. The architecture demonstrates that agents behave in expected ways, increasing trust following positive interactions (e.g., expectations of other team member were met), and decreasing trust following negative interactions. The next step in development is to hypothesize patterns of behavior or linkages that may be associated with idiosyncratic updating that reasonably reflect individual differences such as personality factors which may moderate the functionality of some specified mechanisms. For example, people with higher conscientiousness may engage in more monitoring behaviors of teammates (Wilmot & Ones, 2019). We look forward to discussing the architecture and resultant dynamics.

Title

Thriving in human-AI teams: Exploring critical team compositions, processes, and outcomes

Authors, *presenter*

Catarina M. Santos, Simon B. de Jong, Sjir Uitdewilligen

The era of human-AI work teams is dawning in many organizations (e.g., Bouschery et al., 2023). AI, or artificial intelligence, is defined as “the capability of a machine or computer to imitate intelligent human behavior or thought” (Seeber et al., 2020, p. 3). AI systems are not only being integrated into teams as tools, step-by-step they are becoming akin to actual teammates (e.g., Siemon, 2022). While this potentially holds benefits, as AI can augment the team’s capabilities (Bouschery et al., 2023), additional challenges may arise. The team literature emphasizes the importance of developing a shared understanding among team members about the relevant aspects of the work (i.e., a shared mental model) for team learning and performance (e.g., Santos et al., 2015). Adding AI as team members, however, might critically affect the development of shared mental models as team members may have difficulty understanding the AI’s task and functioning. Given differences in members’ background and experiences, the development of mental models regarding the AI is likely to unfold differently over time for different individuals and teams. To illustrate, some members may be skilled and prepared to work in human-AI teams, while other members (e.g., aging workers) may face challenges in interacting and learning with AI-systems and/or with interacting with their younger/more skilled human co-workers.

Drawing from the literature on the social cognitive theory of learning (Bandura, 2002), we aim to identify the team behaviors and conditions that foster individual/team learning, shared mental model development, and individual/team performance in human-AI teams, and to explore how these phenomena develop over time in different compositions of human-AI teams.

There is a lack of knowledge on the best practices to facilitate interaction between humans and AI (Bouschery et al., 2023). Thus, we shed more light onto this topic, by identifying the most critical components for team effectiveness in human-AI collaboration, while taking demographic composition (and underlying skills) into consideration.

We will conduct a mixed-method and multi-source longitudinal experimental team study, in which human-AI teams have to complete tasks over time. The sessions will be recorded and participants will fill in surveys during the tasks.

The individual and team behaviors will be coded in a qualitative software (e.g., Observer) and longitudinal analyses will be performed in a quantitative software (e.g., RStudio). By combining quantitative and qualitative data over time, we get rich data that is novel and scarce on an emerging phenomenon.

Teams will be short-lived and work on tasks for a limited amount of time, which may have implications for generalising the findings to other settings. However, this reflects the current reality in many organizations (Santistevan & Josserand, 2019).

This study helps advance scientific and practical knowledge, by identifying the critical teamwork and leadership behaviors that promote team processes (e.g., learning and shared mental models) and team effectiveness in human-AI collaboration for a range of differently composed teams.

By identifying the critical behaviors for human-AI collaboration, we will be able to design trainings/interventions to upskill/reskill the current and future team workforce. By focusing on varying team composition, we aim to generate a more inclusive view on this phenomenon, such that all humans can thrive in this rapidly emerging new era.

Title

Dear agent, are we on the same page?
Consequences of shared mental models between humans and agents

Authors, *presenter*

Rebecca Müller, David Schischke

Agents with artificial intelligence are increasingly implemented in human teams to increase their effectiveness. Thereby, agents can hold mental models that enable them to draw conclusions about humans' workload. Based on this conclusion of humans' workload, the agent can decide which specific subtasks it will take over to support the human. If the agent then reacts unexpectedly due to an inappropriate mental model, humans could experience frustration, need for explicit coordination, and low willingness to continue working in the team. Thus, research on human-agent teams (HATs) tries to transfer shared mental models as a proven success factor of human teamwork to HATs. Until now only theoretically assumed, the effect of SMM on team outcomes should be investigated in HATs and be compared to effects in human-human teams (HHTs).

We used two separate data collections (laboratory experiment, online vignette study). In the laboratory experiment, participants were informed that an agent will monitor their performance during the following ten minutes working phase in a control-center simulation. According to the agents' evaluation, participants were allowed to continue working on specific subtasks (if the agent evaluates the humans' performance as good) or not (if the agent evaluates the humans' performance as bad). After the 10 minutes working phase, participants rated their own performance in four subtasks. We manipulated SMM as a between-subject variable with two conditions (different vs. SMM): in three of four subtasks the agents' evaluation was either different or similar as the humans' evaluation of their performance. Afterwards, participants rated their frustration, need for explicit coordination, and willingness to continue working in the team.

In the online vignette study, participants read four different texts about a teamwork, whereas we manipulated SMM (different vs. shared) and team type (HAT vs. HHT) as within-subject variables, resulting in four different combinations of the independent variables (SMM in HAT, SMM in HHT, different mental models in HAT, different mental models in HHT). After each vignette, participants answered questions regarding frustration, need for explicit coordination, and willingness to continue working in the team.

Results based on both studies (N1 = 70; N2 = 90) confirmed that SMM lead to lower frustration, reduced need for explicit coordination, and a higher willingness to continue working in the team compared to different mental models. Results based on study 2 showed that SMM have a stronger effect on frustration and willingness to continue working in HHTs than in HATs.

We provide insights that the crucial effect of SMM on outcomes in HHTs is transferable on HATs, whereas SMM are not as effective in HATs than in HHTs, implying that other influencing factors of affective outcomes (i.e., frustration and willingness to continue working in the team) should be considered in HATs. The limitations of the studies are a reduced external validation due to the experimental designs, ad hoc or imagined teams, student participants, and no actual human-agent teamwork.

Title

Supporting coordination in human-AI teams: A conceptual framework

Authors, *presenter*

Tilman Nols, Anna-Sophie Ulfert-Blank, Josette Gevers

Past and future AI developments will disrupt work in many domains, including healthcare, aviation and the military. This includes team compositions employing highly automated agents as formal teammates, contributing to an overarching team goal through their roles and responsibilities. As a result, interdependence between both parties emerges, making the quality of interactions between humans and AI increasingly important. Interdependence refers to the degree to which team member rely on each other to fulfill their objectives. In situations of heightened interdependence, team members must find ways to organize their actions and work together to promote task completion. Otherwise, the interrelatedness of team members becomes obstructive. As such, it is crucial to understand how human-AI teams can leverage the process of managing their dependencies (i.e., coordination).

Recent literature stresses several barriers to coordination. Limited communication capacity, tracking and understanding automated tasks, and trust issues make coordination difficult. Furthermore, human-AI teams will likely operate in critical domains where interdependencies can surge unpredictably, rendering coordination more complex. To remain functional, teams must adapt their coordination to a dynamic environment requiring processes similar to human teams.

Despite great demands, literature that could facilitate understanding human-AI team coordination stays scattered across disciplines. Accordingly, we seek to integrate different research streams and provide a conceptual framework that helps to improve the management of dependencies across situations in human-AI teams.

Literature from organizational psychology, including team science, cognitive engineering, and human factors spanning the past decades has been examined. After integrating the studies, we identified four overarching principles that govern conditions in which team coordination processes can unfold. We integrate the principles into an overarching framework of coordination in teams.

Our review shows that coordination rests on explicit and implicit mechanisms that occur before or during action execution. Further, coordination relies heavily on information-building processes to support the alignment of actions. Teams require a shared understanding of the structural characteristics of a situation to elicit complementary behaviors that help to resolve dependencies. This understanding is temporary and depends on (1) predictability – the ability to anticipate each other's actions, (2) observability - the ability to make declarative knowledge accessible to others, (3) plannability – the ability to make procedural and strategic knowledge accessible to others and (4) directability – the ability to modify each other's actions.

The four principles describe conditions that render the emergence of coordination between humans and AI more likely. By adhering to these principles, interdependencies can be made more salient and easier to manage. In addition, they acknowledge the dynamics between task and teamwork processes in increasingly dynamic environments.

The identified principles can offer a basis for evaluating human-AI team coordination, and provide guidelines for training and the design of autonomous agents. Nonetheless, research must further test and extend the given propositions.

Title

Challenges and transformations in the human sense of agency in professional interactions with artificial intelligence

Author, *presenter*

Astrid Galsgaard

This study aims to shed light on the psychological implications arising from the integration of artificial intelligence (AI) in diagnostic radiology, particularly its impact on the sense of agency (SoA) among healthcare professionals. Existing healthcare research indicates that the adoption of AI often encounters resistance and skepticism among professionals [1–3]. Drawing upon social-cognitive theories, we posit that one key factor contributing to this resistance may be the technology's potential to undermine individuals' fundamental need for a sense of agency [4]. A robust sense of agency is closely linked to professional motivation, job satisfaction, performance, and self-esteem [5–7]. However, there remains a knowledge gap regarding AI's qualitative effects on human SoA in the context of human-AI interaction (HAII). We hypothesize that AI, positioned as a new form of expertise, will challenge individual professionals' sense of agency, necessitating a transformation in SoA to accommodate this new reality. We further hypothesize that various expertise practices will emerge within HAII, reshaping how professionals perceive their own expertise and how they exercise agency within their professional settings [8]. The insights gleaned from this study will offer researchers and healthcare managers invaluable context-specific insights into professionals' nuanced experiences of SoA in HAII.

This study takes an interdisciplinary approach, integrating perspectives from work-organizational psychology, computer science, and radiology, thus offering a fresh perspective on a subject that has predominantly been examined from a technocentric standpoint. Additionally, by examining the AI implementation process through the lens of individual professionals and intertwining it with the social-cognitive concept of agency, we contribute to the originality of this research.

Design: This qualitative study employs a hermeneutical and practice-based methodology. We investigated two AI implementation processes in separate radiological departments. Over six months, we conducted 20 participatory observations involving five radiographers and five radiologists actively engaged with AI in their work. Subsequently, we conducted semi-structured interviews with all ten participants, equally divided by gender and ranging in age from 27 to 68.

Analysis (yet to be conducted): We will perform a hermeneutical reflexive thematic analysis [9] and pragmatic analysis [10]. Our focus will be on interpreting the individual professional's sense of agency within HAII, their conceptualization of their own expertise, and their interaction with AI. This analytical approach will enable us to explore the intricate relationship between professionals' a) perception of expertise, b) sense of agency, and c) practical engagement with AI.

Our study will yield comprehensive qualitative insights into professionals' sense of agency within the context of HAII and how this sense may be challenged and transformed. By examining how professionals perceive their expertise in relation to AI's expertise, we aim to uncover new modes of agency that may emerge in their interactions with AI. Additionally, we anticipate identifying psychological barriers and drivers affecting AI implementation, offering valuable insights for strategic leadership to promote positive outcomes related to professionals' sense of agency and professional identity, as well as the planning of work practices.

Understanding and trust in how one's own expertise aligns with AI's expertise in decision-making is crucial for a sense of agency, whether it is bolstered or undermined. This understanding can serve as both a barrier and a catalyst for AI adoption. Maintaining and developing a sense of agency in HAII necessitates the cultivation of a form of co-agency through co-expertise with AI. Strategic leadership must delineate the lines of professional and ethical responsibility, especially in cases of both desired and undesired outcomes in decision-making, to ensure a harmonious and productive human-AI partnership.

Paper presentation session: 2

Title

The A(I) team? The effects of realism and gender on willingness to work with a virtual teammate

Authors, *presenter*

Agata Mirowska, Jbid Arsenyan

We investigate under what conditions humans are willing to accept working with an Artificial Intelligence (AI)-driven agent as a collaborative teammate. We build on work on the uncanny valley hypothesis (Mori, 1970), algorithmic appreciation/aversion (Burton et al., 2020; Logg et al., 2019), and individual differences, specifically moral foundations endorsement (Graham et al., 2011) and self-efficacy, to investigate how characteristics of the human and AI teammate affect the former's evaluation of and willingness to work with the latter.

We propose a two-stage moderated mediation model, where one's moral world view and self-efficacy will moderate the effects of AI presentation on evaluation of the AI, and evaluation of AI on willingness to work with the AI, respectively. This study therefore juxtaposes dimensions of the human and AI to investigate acceptance of AI as a teammate. With respect to the AI, given that virtual agents are often portrayed as female (Gersen, 2019), we investigate how the AI agent's portrayed gender and anthropomorphisation affect reactions to it.

This study will adopt an experimental design to test a two-stage moderated mediation model, across two studies. Both studies will recruit participants using the Prolific online platform and be conducted in two parts, completed a minimum of 72 hours apart. In Part 1, participants will be asked to complete the moral foundations questionnaire and indicate how confident they feel in their ability to complete common workplace tasks. In Part 2, participants will be presented with a potential AI teammate (see study manipulations below), and asked to evaluate its eeriness, as well as report how willing they would be to work with this teammate in general, and instead of a human teammate with a similar level of experience as themselves. All AI name, and visual stimuli will be pilot tested to ensure the gender-congruent presentation.

Study 1: This study will use a 1x2 experimental design, with participants asked about their willingness to work with an AI teammate given a gender-neutral name, presented either with no picture or with a gender-neutral visual representation.

Study 2: In this study, the AI teammate will be portrayed as male/female presented either with no picture or a gender-congruent representation (depending on the results of Study 1).

The data will be analysed using the Hayes SPSS Process Macro, Model 21. The mediation model will consist of the AI presentation as the independent variable, operating through evaluations of eeriness to predict willingness to work with the AI teammate. The binding foundation endorsement (from the moral foundations questionnaire) will be placed as the first stage moderator and task-specific self- efficacy as the second stage moderator.

The results of this study will shed light on how AI as teammates can best be implemented. We will be able to provide recommendations regarding the employee population most likely to be open to such collaborations, as well as ideal presentations of the AI teammate.

Title

The signatures of success in human-agent teams

Authors, *presenter*

Noshir Contractor, *Leslie DeChurch*, Lindsay Larson, Vsevolod Suschevskiy, Alexa Harris, Nina Lauharatanahirun, Javier Garcia, Malte Jung, Aaron Schecter

A growing literature on human-agent teaming develops important insights toward understanding and enabling teamwork with autonomous agents. Human-agent collaboration, or teaming, refers to collaborative partnerships between humans and agents aimed at performing tasks. Agents and humans each bring distinctive capabilities, making them ideal teammates. Adding agents to teams holds the potential to create dream teams, capitalizing on the diverse strengths of each. Realizing this potential requires that team members value AI contributions to the team, and incorporates agents into the processes and emergent states of the team.

In this talk we explore the potential for AI to serve as a meaningful and impactful teammate by sharing a series of studies that explore the role of AI, the relations of AI within the team, emergent team processes, and how human teammates perceive the AI's contributions.

We report a series of laboratory experiments conducted using teams of 2 or 3 humans and an AI we refer to as Vero. All teams performed classic problem-solving and creative thinking tasks prevalent in the team literature. The agent was created via Wizard of Oz, and was actually a confederate following some degree of scripting. This approach allows us to imbue the AI with advanced social capabilities used during team interaction so that we can study how the human teammates are reacting to and getting in sync with the AI. Manipulations we examine include the AI function, the degree of naturalistic interaction with the AI, the performance of the AI, the attributions made about instances of failed performance, and the AI's response to teammates when it fails. Furthermore, the teams performed the tasks several times so that we can see the degree to which changes in the agent's behavior activate certain networks and shapes behavioral interactions. We measure teamwork processes like efficacy, trust, coordination, and leadership.

Preliminary findings indicate that team members are more receptive to some teammate functions than others. Teammates appreciate AI contributions to taskwork but resist contribution to team regulation. We also find that people follow a similar attributional process when AI fails as they do with human teammates. When a teammate fails, prior research finds they intuit the reason as due to incompetence or a lack of motivation. These attributions form the basis of expectations of the AI improving or continuing to fail. Interestingly we find people are more willing to get over an AI failure than a human teammate's. We illustrate the attributional process that underlies this shift.

Through a series of laboratory experiments replicating team studies, with an AI, we find evidence of meaningful differences in how people perceive human and machine teammates. These findings point to the importance of attending to these differences, and offer important insights for how to design AI teammates.

Title

Don't you tell me what to do, you are just an artificial intelligence! – Perception, evaluation and motivational function of AI-assisted feedback

Authors, *presenter*

Klara C. Grünwald, Peter Fischer, Eva Lermer, Silke F. Heiss, Matthias Hudecek

While Artificial Intelligence (AI) is becoming more prominent, Oracle (2019) reported that 64% of employees expressed more trust in robots than their managers. This gives the impression that the increasing implementation of AI is a relevant change in the future organizational context and in the context of leadership. However, another study (Tong et al., 2021) found that although AI generated feedback of objectively higher quality compared to feedback from a human manager, paradoxically, AI-assisted feedback was rated as lower quality, and less accepted.

Considering the limited amount of research and the presence of partially contradictory results, we aimed to further investigate the perception of AI in a leadership position, specifically in the context of feedback. Therefore, we compared the perception of AI-assisted feedback to feedback from a human manager. This is the first study to compare AI in a managerial position to a human manager, and the first study using the exact same feedback to compare the perception of AI to human managers. Consequently, any differences observed cannot be attributed to actual quality differences but are more likely due to the source of feedback, i.e., AI vs. human manager.

We set up a 2x2 online scenario-based study. Participants (n=491) were instructed to imagine a hypothetical scenario, in which they were working for several months in a lead position on an important project for their company. Before the last part of the project, the participants now receive feedback from their manager. This feedback was randomly varied in source of feedback (AI vs. human manager) and type of feedback (positive vs. negative).

Positive feedback from AI was significantly better accepted ($\eta2=0.41$), evaluated as higher quality ($\eta2=0.38$) and resulted in higher work motivation ($\eta2=0.34$) than negative feedback from AI. Further, we found that feedback from human managers was better accepted ($\eta2=0.09$), evaluated as more qualitative ($\eta2=0.13$) and led to higher work motivation ($\eta2=0.02$) than the same feedback from AI. Finally, human managers were rated as more competent in providing feedback than AI ($\eta2=0.35$).

We confirmed previous tendencies regarding the perception of AI-assisted feedback and extended these findings by perceived competence of feedback provider and resulting work motivation as a relevant outcome for the organizational context. It is recommended to provide feedback from human managers rather than AI. Thus, the present study can be seen as a critical response to the findings of the survey conducted by Oracle (2019) and demonstrates that AI is empirically not necessarily and unreservedly better accepted than human managers. Further, our study contributes to a critical discussion on the use of AI in the context of feedback.

The present study was a scenario-based study and should be replicated in a real-life organizational context. Future research might also investigate feedback with AI as an additional helping tool to generate higher-quality feedback, which is then provided by a human manager to combine the benefits of both sources.

[*presentation cancelled*]

Title

Roles of AI in collaboration with humans – Automation, augmentation and the future of work

Authors, *presenter*

Andreas Fügener, *Dominik Walzner*, Alok Gupta

The future of work will be characterized by a growing influence of artificial intelligence (AI). Human decision-makers may see significant changes in their day-to-day work as collaboration between humans and AI will likely become more common. In this collaboration, several roles can be simultaneously envisioned for AI.

This work explores the value of AI as a worker (i.e., performing tasks) and as an advisor (i.e., providing decision support to humans) in collaborative environments. Specifically, we answer the following two research questions:

- Dependent on the complementarity between (and relative ability of) humans and AI, in which roles can AI provide the most value?
- How does a distribution of work between humans and AI (that can perform the roles of worker and/or advisor) look like?

We provide a theoretical division-of-labor model that analyzes for a set of task instances the value of different roles that the AI can take on when collaborating with humans. In the role of the worker, the AI takes over task instances from humans. In the role of the advisor, the AI provides decision support for to humans. Finally, we also look at both roles in combination and analyze how the value develops for different levels of complementarity and relative human ability. We validate our theoretical model with an experiment where humans and AI are working together on an image classification task.

Our theoretical model and our experimental results indicate that an introduction of AI for a given task should not necessarily result in full substitution of human capital but rather in a within-task division of labor, meaning that task instances are allocated either to AI alone, humans alone, or humans and AI together. In all settings, collaboration of humans and AI outperforms the benchmark cases in which humans and AI work alone. In high-complementarity settings, the AI provides more value as a worker, whereas in low-complementarity settings, more value is generated when the AI takes on the role of the advisor. In both complementarity settings, the most value is generated when the AI combines the roles of worker and advisor. Employing a hybrid approach rather than committing to a single approach allows us to achieve superior results. When analyzing the allocation of humans and AI to tasks, we see a stable distribution pattern. From an AI's perspective, easy tasks are performed by AI alone, medium tasks are performed by humans with advice (either individual human or small crowd) and difficult tasks are performed by larger human crowd without help from the AI.

Our results show that humans still remain vital in the future of work. However, the introduction of AI will lead to different job designs which will be closely intertwined with AI algorithms. The view about the future of work that emerges from our discussion is in line with other commentators, where AI is said to take over easy, more mundane tasks while leaving more challenging tasks for humans to handle.

Title

Just one the team: AI acceptance in team decision-making

Authors, *presenter*

Leslie DeChurch, Anoop Javalagi, Noshir Contractor

Teams often need to make high-stakes decisions, but meta-analyses of human teams research suggest that even when they have access to all required information, they often overly focus on common information; failing to share the unique information required to optimize decision-making. However, it is unclear whether human-AI teams also behave similarly, and an open question remains: How does having an AI team member influence team decision-making?

Using a high-stakes decision-making exercise, this study examines conditions whereby AI teammates are accepted as valuable team members.

We used a validated hidden profile paradigm (HPP) called Interstellar to conduct an experiment with 35 teams. Each team consisted of an AI and 3-5 human members, who acted as astrobiologists and had unique information about three exoplanets. Their objective was to decide on the exoplanet with the most potential for human colonization. The AI was introduced midway through the deliberation, via a two-page recommendation report, where two experimental manipulations were employed: (1) the AI was either a sole minority or shared a minority viewpoint with another team member, and (2) the AI endorsed either the objectively optimal solution or a suboptimal solution that was better than the majority view. The teams' acceptance or rejection of the AI's recommendation was the criterion for evaluating their decision-making.

To investigate teams' acceptance of the AI's recommendation across experimental conditions, we conducted non-parametric analyses including an overall chi-square test (see Figure 1 [*Appendix, p. 34*]) and two subsequent pairwise tests. Results from the pairwise tests suggest that teams are more likely to (a) follow the AI's recommendation when it proves to be correct—see Figure 2 [*see Appendix, p. 34*], and (b) favor the AI's recommendation when it aligns with that of at least one human teammate—see Figure 3 [*see Appendix, p. 34*]. Even though the majority of team members initially preferred the inferior option, the presence of an accurate minority AI and one supporting human teammate remarkably resulted in 91% of teams making high-quality decisions. Conversely, only 23% of teams made accurate decisions when the AI recommended an intermediate option and had no human teammate with the same preference.

In our study—by design—the AI could not interact in real-time and defend its recommendation; it simply reported its decision. Despite the lack of information on the AI's accuracy, team members could intensify their discussion and share more unique information upon learning the AI's recommendation. Teams were more likely to reach the correct decision when teamed up with a more (vs. less) accurate AI, indicating that they shared more unique information. However, further research is needed to rigorously examine this potential mechanism.

In this talk, we discuss the advantages, disadvantages, and the implications of AI's acceptance in human-AI teams; emphasizing measures that could be implemented to design AI to optimize team decision-making. In sum, we conducted an experiment using a validated space-themed HPP task, and we marshal preliminary evidence of an AI teammate contributing to a high-stakes team decision making task.

Title

Where is the “we” in human-AI teams?: Building a model for human-agent team dynamics research

Authors, *presenter*

Rui Prada, Astrid C. Homan, Gerben A. van Kleef

Human-agent teamwork is a promising research stream with great potential to impact society. With the increasing inclusion of AI in the tools and processes used in workplaces (e.g., Jacobsson et al., 2012; Sebo et al., 2020), the collaboration between people and AI systems is both inevitable and desirable (Johnson & Vera, 2019), but also associated with complexities and problems (Larson & DeChurch, 2020). Research on collaborative AI and human-agent interaction has tackled the topic from several perspectives, but a comprehensive and integrative focus on teams as a unit and a model for human-agent team dynamics is still missing. Our goal is to provide such a model.

Our conceptual focus is aimed at involving AI agents as active team members rather than just autonomous tools humans use. Although it has been proposed that “human and machine capabilities are most productively harnessed by designing systems in which humans and machines function collaboratively in ways that complement each other’s strengths and counterbalance each other’s limitations.” (Guszcza & Schwartz, 2020, p. 28), the current status of research does not provide sufficient insights into how to reach this goal. We argue a team perspective on human-agent collaboration requires new models that entail challenges and opportunities for AI and humans alike.

In this theoretical paper, we propose that AI needs new models to build understanding of team level variables, such as team structure and cohesion, to be able to monitor and effectively respond to the team. Additionally, AI needs to develop an understanding of the needs and threats in humans associated with working with AI. Notwithstanding the important role of trust in AI (Schaefer et al., 2011; Ulfert & Georganta, 2020), effective and sustainable human-agent teams require more than high levels of trust. Humans, in turn, need to be able to incorporate agents as team members in their mental models of teamwork and integrate them in team processes.

We offer an integrative framework for understanding the characteristics of both fields relevant to human-agent teamwork. More specifically, we illuminate those team-related aspects that are critical for understanding how to build successful human-agent teams. We propose a systemic view in which critical team dynamics are considered in conjunction with individual needs, interpersonal relations, and organizational factors impinging on human-agent collaboration. Using the Input-Mediator-Output-Input (IMOI) model as a starting point (Johnson et al., 2005), we describe the core processes that are crucial in human-agent teams and discuss how these processes can be stimulated and understood from both the agent and human perspective.

To fulfill the vision of creating successful, sustainable human-agent teams, we need to integrate key insights from research in both AI and social sciences. Based on our understanding and integration of pertinent work from both fields, we believe updating mental models of both humans and AI agents is essential to facilitating mutual understanding and making human-agent teams work.

Title

Human-AI teaming literature clusters: Finding a team in a paper stack?

Authors, *presenter*

Patrícia Costa, Lisa Handke, Rebecca Müller, Pedro Marques-Quinteiro

The integration of human-artificial intelligence collaboration is at the forefront of teamwork research, with growing emphasis on variables that promote or hinder inclusion of artificial intelligent (AI) agents within teams, that is, humans and machines interacting collaboratively and interdependently towards shared goals. Despite the relevance of understanding how humans and AI agents can work together effectively, the research in this area is grounded in distinct fields and traditions, from engineering to social sciences. Because of this divide and resulting differences in perspectives and methodologies, it is possible that researchers from distinct fields are unable to build on each other's contributions and are unaware of the fact that multiple research groups from different research areas are working on human - AI collaboration simultaneously. In turn, this limits a multidisciplinary, holistic understanding of this phenomenon and the ability to maximize the potential of these composite teams.

In this work, we examine the myriad of research clusters that focus on human-AI teaming and present a comprehensive framework that links them to conceptual work on teams and teamwork. We start by a co-citation analysis. Our findings (see Figure 1) show 5 main clusters: Cluster 1 (purple) is composed of older works that represent initial approaches to studying human-machines interaction, such as voluntary activation of technology by humans, situation- action and other rather dispersed contributions; Cluster 2 (blue) encompasses the technical aspects of physical human-robot interactions, including impedance control, movement and manipulation, and the physical element of operating machines; Cluster 3 (green) is related to human-robot interaction in applied industrial settings, and includes research on safety, control, and dependability; Cluster 4 (red) papers relate to how robots are perceived by humans, and comprise studies on robot anthropomorphism, or computers as social actors; Cluster 5 (yellow) focuses on human-agent interaction and its relationship with work and organizational psychology related outcomes at different levels of automation (e.g. trust, workload).

After presenting an overview of the clusters, we derive a comprehensive overview of each one, highlighting the divide between an engineering-type and a psychology-type stream, as well as a lack of research focusing on the role that AI agents play on team dynamics. We then present a set of challenging issues for the advance of the field of human-AI teaming, such as the need for a clear definition of human-AI teams. Specifically, we emphasize the need for solid conceptual work that, merging knowledge from the teams' literature and from the different clusters found, lays the foundation for future research. We finish by advancing some theoretical proposals that aim at addressing the fundamental issues identified as missing. Our contribution, therefore, is twofold. On the one hand, we present a descriptive overview of the multiple contributions in the human-AI teaming research by co-citation analysis; on the other hand, we build on that descriptive analysis and develop a future-oriented framework that upgrades the research possibilities of this highly relevant field.

Title

Training human-robot teams: A scoping review and theoretical framework

Authors, *presenter*

Raquel Salcedo Gil, Anna-Sophie Ulfert-Blank, Pascale Le Blanc, Sonja Rispens

To date, team training has focused primarily on collaboration among human team members. However, with the introduction of robots, team characteristics in industrial settings are starting to change. Across industries, robots are implemented to assist employees, decrease workload, or increase efficiency. As their capabilities continuously improve, collaboration between humans and robotic systems becomes more common and interdependent. To achieve optimal Human-Robot Collaboration (HRC), the introduction of robots in the workplace must be complemented by training interventions to facilitate mutual adaptation. The present study aims to review existing literature and to develop an initial framework for designing training campaigns in which humans and robots are mutually trained.

The value of the current study lies in combining insights from human-team training, HRC, and computer science literature to develop an initial framework for training Human-Robot Teams (HRTs). In addition to training humans and robots separately, we suggest that the way to go forward and achieve optimal collaboration is to train them together.

We have completed a scoping review to compare and evaluate different training approaches for HRTs. We searched PsycINFO and ACM Library databases for English peer-reviewed articles published between 2000 and 2023. The following search string was used to search in titles and abstracts: ("Human" OR "Operator") AND ("robot" OR "cobot") AND ("Training"). Building on this review and additional training literature, we develop an initial framework for designing training programs in which humans, robots, and HRTs are trained through different phases.

Out of the 234 initial articles that emerged from the search, only five matched all inclusion criteria. All these articles are written from a technical perspective, making the need for more psychological literature on the topic visible. Building on team training literature, we propose different themes, such as coordination, that should be addressed as part of the HRTs training. Based on these themes, we develop propositions. In addition, we discuss steps to be taken before implementing the training (e.g., task, skills analysis).

The literature on HRTs training is still scarce. The scoping review showed that when the goal is that humans and robots perform tasks as a team, further efforts to study, develop, and evaluate training programs in which humans and robots are trained together should be made. In this study, we develop a framework to enhance our understanding of how organizations can train their Human-Robot Teams so that they can adapt to each other and achieve optimal collaboration. Thus, this study contributes directly to the academic literature on Human-Robot Collaboration and Human-AI Teaming.

Due to the emerging nature of this research field, the availability and quality of literature on training approaches designed explicitly for HRTs is a significant constraint. Nevertheless, we propose how existing literature on training human teams can be applied to these new types of teams. It is important to highlight that this is only an initial framework, and further efforts are needed toward developing validated training approaches for HRTs.

Title

Human-autonomy teaming: Observations about the state of the science

Authors, *presenter*

Thomas A. O'Neill, Christopher Flathmann, Nathan McNeese, Eduardo Salas

Collaboration in organizations is critical for adaptability, innovation, learning, and performance. However, technologies available to teams have rapidly advanced in recent years, and a new form of team is on the rise: the Human-Autonomy Team (HAT). A HAT occurs when at least one member of the team meets the definition for an “autonomous agent”, another member is human, and the team members are dependent on each other for achieving a collective goal (O’Neill et al., 2022). A major challenge in this field involves construct proliferation, lack of theory, lack of attention to the multi-level nature of teamwork, and inconsistency in research methods.

In light of our theoretical work, systematic review, and future research suggestions published in Human Factors (2022) and in our Special Issue in Computers in Human Behavior (2023) on HATs, we will provide observations summarizing the state of the science and recommendations for the future of HAT research.

We will extract key observations and implications from recent reviews of the HAT literature as well as share our observations drived from guest-editing a recent journal Special Issue on the subject.

Our observations center on the adoption of a common organizing framework (the Input-Mediator-Output model), definitional issues and boundaries of HATs (versus Human-Automation Interaction and related constructs), methodological issues (e.g., various Wizard of Oz techniques versus computational agents), and areas of focus for future research. We also believe that robust theories of high performing HATs are needed.

Attendees will leave with a clearer sense of the state of the science in HAT research, theoretical lenses, criteria for HATs, and an enhanced focus for thinking about future research directions.

APPENDIX

see abstract p. 19

Title

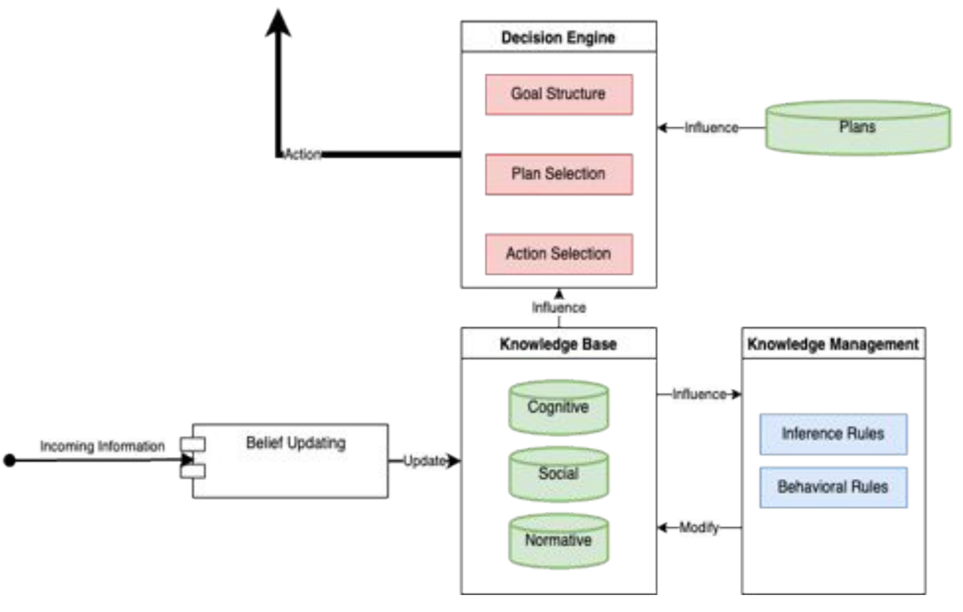
An agent architecture to simulate human-AI trust dynamics

Authors

Neal Outland, Brandon Kang, Sierra Stryker

Figure 1

Cognitive Agent Architecture



APPENDIX

see abstract p. 28

Title

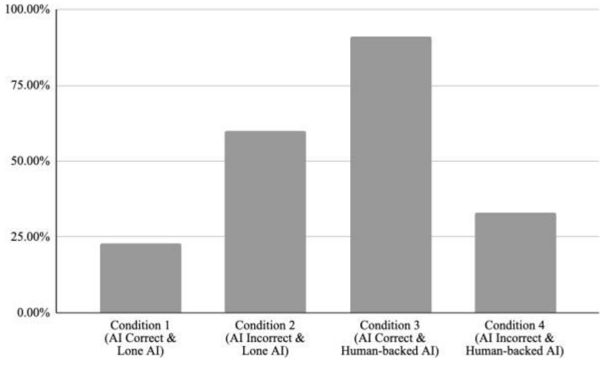
Just one the team: AI acceptance in team decision-making

Authors

Leslie DeChurch, Anoop Javalagi, Noshir Contractor

Figure 1

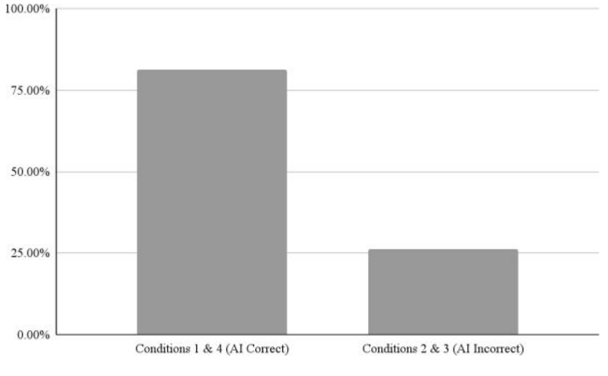
Acceptance of AI's Recommendation across Experimental Conditions.



Note. Overall Test X^2 (3, N = 35 teams) = 12.0, p < .05.

Figure 2

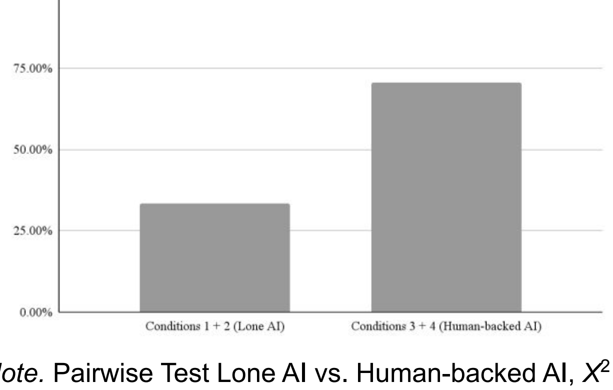
Acceptance of AI's Recommendation for Teams with Correct and Incorrect AI.



Note. Pairwise Test AI Correct vs. AI Incorrect, X^2 (1, N = 35 teams) = 10.5, p < .05.

Figure 3

Acceptance of AI's Recommendation for Teams with Lone and Human-backed AI.



Note. Pairwise Test Lone AI vs. Human-backed AI, X^2 (1, N = 35 teams) = 4.9, p < .05.

University of Amsterdam, Roeterseiland Campus

📍 [Nieuwe Achtergracht 129B, Amsterdam]

The Roeterseiland campus is located in the center of Amsterdam, adjacent to the Plantage neighbourhood. The campus is easily accessible by tram, metro (Weesperplein station), bus or bicycle.

Small Group Meeting in Building G

Entrance to Building G (Registration & Opening Ceremony on second floor)

Borrel

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We look forward to your submissions!

You can find further information here.

Amsterdam is known for many things, including its romantic scenery, rich cultural heritage and delicious food. Here are some tips if you have time to explore the city!

Lanskroon for Stroopwafels

One popular Dutch treat that you can find in Amsterdam is the stroopwafel. A stroopwafel is a sweet, caramel-filled waffle cookie that is enjoyed by locals and visitors alike.The highly recommended place to try by the locals is Lanskroon. Located in the Jordaan district, Lanskroon is a popular bakery that has been serving stroopwafels since 1902. They offer traditional stroopwafels as well as creative variations like chocolate-covered stroopwafels.

📍 Singel 385, 1012 WL Amsterdam

Café Winkel 43 - Best Dutch Apple Pie

In the middle of Amsterdam there's this cute little café where you can enjoy some of the best Dutch apple pie. Café Winkel 43 is located on the Noordermarkt square in the "Jordaan" district which is about a 10-minute walk from the Anne Frank House. The café is mostly known for its apple pie but they also serve great small appetizers, breakfast, and lunch.

📍 Noordermarkt 43, 1015 NA Amsterdam

Wil Graanstra Friteshuis

No trip to Amsterdam is complete without fries, and Wil Graanstra's legendary patatkraam (fries stall) is one of the city's finest. The family-run operation has been on the square beside the Westerkerk since 1956. Graanstra fries fresh-cut potatoes to order, to be enjoyed simply with mayonnaise or ketchup. Go early. He usually sells out by mid-afternoon.

📍 Westermarkt 11, 1016 DH Amsterdam

Fromagerie Abraham Kef

Fromagerie Abraham Kef supplies many restaurants in Amsterdam with cheese. At the flagship shop, established on Marnixstraat in 1953, you can taste Kef's excellent raw-milk cheeses and some magnificent aged Dutch cheeses (don't leave without trying some Remeker). In 2014, the shop opened a second location on the Czaar Peterstraat, followed by a tasting room on the Van der Pekplein in Amsterdam Noord, but it's worth visiting the original to see where it all started.

📍 Marnixstraat 192B, 1016 TJ Amsterdam

De Ballenbar

Do not miss the bitterballen! This savoury Dutch snack is one of the city's most famous food staples - and it's one hell of a tasty treat. Loved by locals and tourists alike, bitterballen is a breaded meatball that's been deep fried - a bit like a croquette but sphere-shaped. De Ballenbar is a food stand within a funky food market called Foodhallen that serves up authentic bitterballen with a culinary twist! This place offers different flavours of bitterballen with inventive fillings like shrimp, calf and truffle - as well as the traditional style of bitterballen which you can try too for those who don't want to stray from the real deal. The great thing about Foodhallen is that you can sample food from all over the world at some other awesome stands while you're there.

📍 Hannie Dankbaarpassage 16, Stand 8, 1053 RT, Amsterdam

Noordermarkt
The Noordermarkt is a cosy and colourful market of international allure. A market with a historical background dating back to the 17th century. On both Monday morning (9:00 AM - 1:00 PM) and Saturday (9:00 AM - 4:00 PM), the range on the Noordermarkt can be called unique. In no other market in Amsterdam, you will find so many different products: antiques and curiosities, books and prints, special textiles, glass and crockery, jewellery of your own design, vintage clothing, paintings and graphics, bags made of recycled canvas and so on.

📍 Noordermarkt, 1015 MV Amsterdam

The Museum Quarter
Amsterdam is home to various world-famous museums, and no trip to the city is complete without stopping by the Rijksmuseum, Van Gogh Museum or Stedelijk Museum. But the city also has a multitude of quirky treasures outside of the Museum Quarter. From museums about cats and stunning photography galleries to an unusual collection of self-playing pianos - you're guaranteed to find an inspiring exhibition!

📍 Museumplein, DJ Amsterdam

Canal Cruise
Taking a canal cruise is one of the most popular things to do in Amsterdam and many famous people have got to know the city from the deck of a canal cruise boat, for example, Winston Churchill, The Beatles and Nelson Mandela. We recommend that you do the same. You can visit the canal cruise booking webpage here to see all the different options available

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