

Association for Information Systems

AIS Electronic Library (AISeL)

ECIS 2023 Research Papers

ECIS 2023 Proceedings

5-19-2023

HUMAN-AI COLLABORATION IN EVERYDAY WORK-LIFE PRACTICES: A COREGULATION PERSPECTIVE

Talitakuum Ekandjo

Jocelyn Cranefield

Yi-Te Chiu

Follow this and additional works at: https://aisel.aisnet.org/ecis2023_rp

This material is brought to you by the ECIS 2023 Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2023 Research Papers by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

HUMAN-AI COLLABORATION IN EVERYDAY WORK-LIFE PRACTICES: A COREGULATION PERSPECTIVE

Research Paper

Talitakuum Ekandjo, Victoria University of Wellington, New Zealand,
talitakuum.ekandjo@vuw.ac.nz

Jocelyn Cranefield, Victoria University of Wellington, New Zealand,
jocelyn.cranefield@vuw.ac.nz

Yi-Te Chiu, Victoria University of Wellington, New Zealand, yi-te.chiu@vuw.ac.nz

Abstract

Driven by the growing integration of Artificial Intelligence (AI) into daily work, this study investigates the Human-Intelligent Personal Assistants (IPAs) coregulation of work-life practices. Guided by an interpretive case study of Microsoft Viva Insights (MVI), we focus on the participation and influence of IPAs in daily work-life practices. Our findings reveal three coregulatory roles adopted by IPAs—rationalist, normalist, and moralist—that influence personal productivity, social bonding and relationship management, self-care, and work-life boundary management practices. By diving deeper into the human-AI relationship from a coregulation perspective, we contribute to the emerging IS literature on the nature and role of AI in transforming how people work. Our research provides valuable insights for practitioners, developers, and scholars aiming to enhance AI design and management, and investigate AI's broader impact on human behaviours at work.

Keywords: AI, Intelligent Personal Assistants, Coregulation, Work-life Practices.

1 Introduction

Imagine this: At 5.25 AM on a Monday, September 26, you get an email from Microsoft Viva briefing you of your upcoming daily commitments and follow-ups as well as openings in your calendar for you to book focus time or set aside time to prepare for a meeting. Later in the day, you get a notification to send praise to a colleague. As you get ready to go home, a notification comes in asking if you are "ready to wrap up?" You respond, and Viva takes you through a process of reviewing tasks, reflecting on your emotions, and meditating to mindfully disconnect. Later that evening, you remembered that you did not respond to a colleague's email earlier that day. As you write the email, an add-in prompts you to delay sending the email until tomorrow at 10:00 AM, "when most recipients are in their work hours". So, you click on the "delay send" option. As time passes, you find yourself accustomed to following Viva's daily advice and suggestions.

We are witnessing unprecedented transformations in how we work as the proliferation of Artificial Intelligence (AI) in our daily professional lives intensifies. The recent implementation of AI tools such as ChatGPT and Microsoft Copilot¹ highlights a shift in our daily lives. In parallel, advancements in AI and data analytics are giving rise to Information Systems (IS) that exhibit a higher level of autonomy and decision-making capabilities than conventional digital technologies (Ågerfalk, 2020; Baird and

¹ <https://blogs.microsoft.com/blog/2023/03/16/introducing-microsoft-365-copilot-your-copilot-for-work/>

Maruping, 2021; Murray et al., 2021). Emerging IS can "learn, adapt, act autonomously, and be aware of the need to act without being prompted by users" (Baird and Maruping, 2021, p. 316). This increased agency enables these systems to actively influence and shape human behaviours, organisational practices, decision-making processes and interactions (Faraj et al., 2018; Sowa et al., 2021; Strich et al., 2021; Tarafdar et al., 2022; van den Broek et al., 2020), rather than merely serving as passive tools or information repositories (Orlikowski, 2000). However, concerns arise that such agency will have negative consequences for humankind. Recently, the media² widely reported that tech leaders have argued for a pause on the development of AI due to the profound risks it poses to society and humanity, highlighting the urgent need to understand and address the potential negative consequences of AI.

This study answers the call for a better understanding of new forms of human-AI relationships and their implications (Jain et al., 2021; Rai et al., 2019; Schuetz and Venkatesh, 2020). Of interest and focus in this study is the Human-Intelligent Personal Assistants (IPAs) coregulation relationship. IPAs are AI systems that use AI techniques such as Machine Learning (ML) and Natural Language Processing (NLP) to support, influence, and/or direct individual decisions and behaviours through personalised and actionable recommendations. Coregulation is the process in which an individual and an "other" share in the individual's self-regulatory processes (Patrick and Middleton, 2002). From a coregulation perspective, IPAs can be viewed as social actors (Gambino et al., 2020) that actively shape, influence, direct, evaluate, and control human workers (Cranefield et al., 2022) based on their intelligence, autonomy, and adaptability (Baird and Maruping, 2021). To coregulate, IPAs assume responsibilities typically performed by human coregulators (i.e., peers, teachers, supervisors, or coaches (Cranefield et al., 2022; Molenaar, 2022)) to guide, direct, and prescribe ideal work-life practices. In this study, work-life practices refer to "organised human activities" (Lanamäki *et al.*, 2020, p. 4) or routinised types of behaviours (Jarzabkowski et al., 2007; Reckwitz, 2002) implicated in daily organising and working. Previous studies argue that AI can play a role in the coregulation of work and behaviours (Cranefield et al., 2022; Molenaar, 2022), and such partnerships can potentially improve how people work, and consequently their productivity and wellbeing (Winikoff et al., 2021). Despite that, coregulation of practices has been overlooked in IS research as an important application of AI in work settings.

The current paper intends to extend existing work on the role of AI in supporting self-regulatory processes (Cranefield et al., 2022; Molenaar, 2022). This study aims to explore and understand the nature of human-IPA coregulation of work-life practices, with a particular emphasis on the involvement and contribution of IPAs in regulating those practices. The following question guides the research: *What strategies do IPAs employ to participate and share in workers' regulation of daily work-life practices?* To answer these questions, we conducted an interpretive case study of Microsoft Viva Insights (MVI), an IPA designed to foster healthier and more productive work-life practices through data-driven insights and intelligent coaching (Bergen, 2017b). Our analysis focuses on understanding workers' experiences with the IPA in coregulating their daily work-life practices and the subtle role the IPA plays in guiding, supporting, or constructing a need for change in how workers organise and work. Our findings revealed three coregulatory roles: rationalist, normalist, and moralist, that the IPA adopted to coregulate personal productivity, social bonding and relationship management, self-care, and work-life boundary management practices. By delving deeper into the human-IPA relationship from a coregulation perspective, we expand our understanding of the dynamic and active role AI can play in shaping daily work-life practices and its implications. Our research offers valuable insights for practitioners and developers seeking to improve the design, implementation, and management of AI as well as for scholars interested in exploring the broader implications of AI on human behaviours. We hope to instigate further conversations and investigations into the evolving relationships between humans and emerging IPAs in the workplace.

This paper is structured as follows. Section 2 describes the theoretical foundation guiding the research. Section 3 outlines the research method, and Section 4 presents the findings of our analysis. Section 5 discusses the findings before the paper concludes.

² <https://www.reuters.com/technology/musk-experts-urge-pause-training-ai-systems-that-can-outperform-gpt-4-2023-03-29/>

2 Background

2.1 The theoretical concept of coregulation

The concept of coregulation emerged from sociocultural theories (Moreno et al., 2016), which highlight the role of social contexts and interactions with others in fostering, developing, and maintaining an individual's self-regulatory processes (Hadwin, 2004; McCaslin, 2009; Zimmerman, 2000). Self-regulation is a process that involves planning, monitoring, controlling and reflecting on one's own behaviour, thoughts and emotions (Pintrich, 2000; Zimmerman, 2000). Self-regulation is not innate but is shaped and developed through interactions with others (Hadwin, 2004; Patrick and Middleton, 2002). Thus, coregulation underlies the importance of the agency of coregulators in facilitating the development of self-regulation in individuals. McCaslin (2009) defines coregulation as the process by which individuals coordinate their self-regulatory processes with the help of social others who challenge, shape and guide them towards independent self-regulation. Coregulators also provide scaffolding and support that enables individuals to gradually take on more responsibility for their own self-regulation (Heritage, 2016; Lobo and Lunkenheimer, 2011; McCaslin et al., 2006). The importance of social actors such as teachers, parents, peers and coaches in promoting self-regulation has been explored in various literature. For example, research has shown that teachers can facilitate the development of self-regulation in students by providing clear instructions, feedback and opportunities for practice (McCaslin et al., 2006). Parents can support the development of their children's self-regulation by providing emotional support and demonstrating goal-oriented behaviours (Lobo and Lunkenheimer, 2011). Peers can also support an individual's self-regulation through collaborative learning activities and peer feedback (Järvenoja et al., 2020). Coaches can help athletes to develop self-regulation by setting goals, providing feedback and creating a supportive training environment (van den Berg and Surujlal, 2020). Therefore, coregulation is an important concept to investigate in the workplace as it emphasises the role of social interactions in promoting self-regulation, potentially helping workers deal with behaviours (e.g., procrastination) that may negatively impact productivity at work (Kimani et al., 2019).

2.2 Human-IPA coregulation

Coregulation is traditionally examined within human-human relationships, but, it can also be applied to human-IPA relationships (Cranefield et al., 2022; Molenaar, 2022). Based on the literature above, human-IPA coregulation can be defined as involving a bidirectional, dynamic, and context-specific interaction between humans and IPAs, where both parties shape each other's functioning and behaviours. This means that humans adapt, modify and use IPAs to achieve goals, whilst IPAs, through their evolving (constantly updated) affordances and features, enable or constrain humans' self-regulatory processes (Cranefield et al., 2022; Molenaar, 2022). The human-IPA coregulation relationship may also involve scaffolding where the IPAs support human self-regulatory skill acquisition or goal achievement (Cranefield et al., 2022).

Human-IPA coregulation relationships may differ from those with human-human coregulation relationships, as IPAs do not have the same social standing and agency as human coregulators (Korteling et al., 2021). For instance, as opposed to the human nature of being judgemental, IPAs are non-judgemental and supportive, which helps reduce feelings of sadness, fear, anxiety or defensiveness (Lucas et al., 2014) that may arise when receiving feedback or advice from a supervisor or peer (Jackman and Strober, 2003). Moreover, unlike human coregulators who might not be available when needed, IPAs can be accessible anytime and anywhere (Gubareva and Lopes, 2020), offering ongoing support, motivation, and behavioural reinforcement through continuous monitoring, timely reminders, real-time feedback, and recommendations. In addition, IPAs' ability to provide personalised insights, feedback, and recommendations tailored to each worker's specific needs and preferences (Kaplan and Haenlein, 2019) can help workers to make informed decisions and adjust their behaviours accordingly. However, because the insights and suggestions are algorithmic and data-driven (Berninger et al., 2020; Markus, 2017), workers might be sceptical or reluctant to accept them due to perceived incompleteness or inaccuracy (Tarafdar et al., 2022).

Despite the benefits, human-IPA coregulation relationships raise concerns that might not arise with human coregulators. IPAs' ability to leverage social norms and expectations (Cranefield et al., 2022) and emotional connections (Grover et al., 2020) give them considerable agency, including the ability to manipulate human perceptions, behaviours, and emotions with serious consequences (Ashton and Franklin, 2022; Hildebrandt, 2019). For instance, offering normative suggestions (Winikoff et al., 2021) that contradict human coregulators' advice (Schafheitle et al., 2021) could lead to tension and conflict in human interpersonal relationships (Ekandjo et al., 2020). In addition, IPAs' datafication of work behaviours and algorithmic-driven suggestions can adversely affect human dignity, autonomy, and technological dependence (e.g., a decrease in unique human knowledge) (Fügener et al., 2021; Leidner and Tona, 2021; Newell and Marabelli, 2015).

While several scholars have investigated IPAs for supporting workers' daily work-life practices through self-monitoring and reflection (e.g., Grover et al., 2020; Kimani et al., 2019; Kocielnik et al., 2018; Williams et al., 2018), they have mainly focused on the design, development and usability evaluation of the potential of IPAs. This limits our understanding of the complex relationships between humans and AI. This study aims to delve deeper into the role of IPAs in supporting, shaping and influencing work-life practices and their implications. Next, we present our research approach.

3 Research Approach

This research belongs to the interpretation-centric and inductive research genre (Sarker et al., 2018). We conducted an interpretive single case study (Walsham, 1995) to answer the research question. Interpretive research allows researchers to conduct broad investigations, gain real-world insights, and provide a more in-depth understanding of the novel and less understood IS phenomena (Klein and Myers, 1999; Walsham, 1995). The research was approved by the university's Human Ethics Committee. Next, we present the data collection and analysis procedures.

3.1 The empirical case and context of the study

The empirical context of our study comprises MVI (previously known as MyAnalytics) and its application in daily work of Knowledge Workers (KWs) from five New Zealand (NZ) organisations. KWs have been found to struggle with managing productivity and wellbeing (Kimani et al., 2019); hence they were deemed as appropriate subjects for this research. MVI is part of the Microsoft Viva suite, an employee experience platform aimed at enhancing workplace productivity, collaboration, and wellbeing (Schafer, 2021). MVI is integrated into the Office 365 ecosystem and interacts with workers via various modalities: Microsoft Teams, a cloud-based dashboard, and Outlook (Insights add-in, daily briefings, digest emails, and inline suggestions) (Microsoft, 2022), enabling daily interaction with AI. As an AI system, MVI utilises "sophisticated machine learning and analytics" (Fuller, 2016, 02:19:07) and "natural language processing" (Bergen, 2017a, 02:52:09) to provide workers with personalised insights and actionable "AI-powered suggestions" (Janardhan, 2019). ML and analytics enable MVI to collect and analyse large volumes of data from various sources on Office 365 platforms such as emails, calendars, Teams, and OneDrive, identify behavioural patterns in the data, understand workers' preferences, make predictions, and offer personalised, actionable insights and recommendations. NLP enables MVI to understand and process written text, such as the content of emails, documents, and chat messages, to extract relevant information and provide valuable insights and digital nudges.

While MVI has undergone major changes since this study, at the time of data collection and analysis, its key insights driven by AI were categorised into four broad themes: focus, wellbeing, network, and collaboration. These insights were accompanied by research-based recommendations for improving work patterns and periodically refreshed educational tips and ideas on productivity and wellbeing from various academic and industry resources. In addition, MVI appeared to use positive reinforcement and learning for behavioural change (Vlaev et al., 2016), coaching, nudging and rewarding workers to adopt healthier work habits and behaviours. The Inline suggestions feature offered AI-driven actionable suggestions or nudges (e.g., asking workers to book time for focused work, take regular breaks, reflect on emotions, praise coworkers, and practice mindfulness). The monthly digest emails often contained

commendations for adopting "ideal" behaviours. MVI further sent daily briefing emails about relevant items (e.g., outstanding commitments or requests, suggested times to schedule for focusing or catching up on messages) to help workers take control and be intentional about their day.

The introduction of MVI in the workplace has led to lively debates in both media and academic discourses about using AI to influence human behaviours and experiences at work (Cliff, 2018; Hern, 2020; Lomborg, 2022). Therefore, we considered MVI as a suitable case for investigating human-IPA coregulation of work-life practices.

3.2 Data collection

We collected data from a variety of sources using multiple methods, including single interviews, analytic autoethnography, and secondary data. Method triangulation and data triangulation enhanced the study's credibility and reliability and provided a comprehensive and well-rounded understanding of the phenomenon. *Interviews* were conducted with 26 KWs from three private sector and two public sector organisations in NZ between May 2021 and May 2022. The aim of the interviews was to gain an understanding of workers' views and experiences interacting and engaging with MVI in their daily practices. The participants were recruited through personal contacts, referrals, and the professional networking platform LinkedIn. Given that the research occurred amid the COVID-19 pandemic, which posed challenges in reaching potential interviewees, we opted for convenience sampling. Convenience sampling is a non-probability or non-random sampling method in which participants are selected based on practical considerations, such as ease of access, geographic proximity, availability during a specific time, or willingness to participate in the study (Etikan et al., 2016). Specific criteria were established to guarantee that the selected participants possessed the ability to offer valuable insights into the phenomenon under investigation. To be eligible for participation, individuals needed to be frequent users (i.e., use and engage with MVI at least once per week), and to have used MVI for at least a month prior to data collection. Our sample included fourteen female and twelve male KWs from diverse social and cultural backgrounds, with work experience ranging between 3 and 25 years in fields like government, technology, education and financial institutions. The interview protocol was tested with two doctoral students (one in information systems and another in education) to ensure performance reliability. Interviews lasted between 35 and 60 minutes and were held via Zoom, Microsoft Teams, or face-to-face. During the interviews, participants were asked to describe their daily work practices, why they used MVI, ways in which MVI supported their daily practices and challenges they had encountered during their interactions. All interviews were recorded, transcribed using otter.ai (an AI audio transcription tool) and manually checked to correct any errors. Transcripts were validated by participants for accuracy.

We also relied on our experiences collaborating and engaging with MVI. We adopted *analytic autoethnography* – a qualitative research approach that allows a researcher to be a full member of the research group or setting, committed to developing theoretical understandings of broader social phenomena, and visible as such a member in published texts (Anderson, 2006; Vryan, 2006). This method heightened our awareness of the phenomenon under investigation, allowing us to comprehend the progression and operational mechanisms of the MVI. The first author, who started engaging with MVI in 2017, spent time interacting and documenting her experience with MVI and taking screenshots of her interaction with MVI during the study. She captured over 60 screenshots, including daily briefing emails, monthly digest emails, inline suggestions, cloud-based dashboard insights and Teams MVI dashboard, and notifications and reminders. The autoethnographic data were used to gain a broad and detailed understanding of how MVI interacted with workers without requiring participants to share sensitive personal data. We also used this data to gain insights into the mechanisms through which MVI shared and participated in the coregulation of practices.

In addition, we also gained insights into MVI working mechanisms and evolution by drawing from *secondary data*. We collected 23 articles and documents from Microsoft webpages (Microsoft.com and techcommunity.microsoft.com) and 21 video presentations from Microsoft YouTube channels (Microsoft Mechanic and Microsoft 365). The video presentations were transcribed using the Microsoft

Dictate feature in Microsoft Word and manually checked to correct errors. This secondary data provided important contextual information regarding the development of MVI, its functionality, features, and objectives, and allowed us to confirm the accuracy of participants' comprehension of MVI.

3.3 Data analysis

We used NVivo 12 software to code the data. Coding is an iterative process in which the researcher frequently pauses to reflect before returning to the analysis, enabling a deeper interpretation of the data. We employed thematic analysis to iteratively and inductively code and search for descriptive themes or patterns within our qualitative data (e.g., interviews, documents) and review and refine themes to develop an overall understanding of the data (Braun and Clarke, 2006; Nowell et al., 2017). The first author coded and analysed the data independently and kept a research journal of memos capturing thoughts, ideas, and observations (Creswell, 2007). To ensure the findings represented the data collected, the research team discussed and refined the codes and emerging themes in regular team meetings.

The data analysis process featured two phases. In the first phase, we focused on identifying and understanding workers' experiences, the work-life practices MVI supports, and the practical ways (e.g., features) in which it supported those practices. To start the data analysis process, the first step involved reading all the interview and video transcripts, documents, and screenshots, performing open coding, and extracting relevant quotes from the data to generate initial codes (Nowell et al., 2017). These were descriptive codes reflected the views and experiences of the workers of coregulating daily practices with the IPA. For example, a statement like "*I tend to use it to put my focus time. I've got it set up so that my focus time is automatically put in*" [Nangy, an Information Specialist] was coded as 'planning and automatically setting time for focused work', and "*I have it [MVI virtual commute] preset for 7:30 at night because I work to 8:00 PM. So, at 7:30, it prompts for the virtual ride home - time to start finishing up my day and tidying up any loose ends*" [Nala, Team Lead] was coded as 'reminders to detach from work'. In the second step, we refined the codes generated from open coding by establishing relationships and consistencies between them and reorganising them into emerging themes (Nowell et al., 2017). This resulted in themes such as 'planning time and effort' and 'setting and maintaining work and personal life boundaries'. The last step involved a more abstract level of analysis, reviewing, refining, and grouping themes into broader categories (Nowell et al., 2017) of work-life practices, such as 'personal productivity practices' and 'work and personal life boundary management practices'.

In the second phase of analysis, we performed another round of coding, focusing on autoethnographic and secondary data, to generate detailed insights into the mechanisms MVI deployed to shape the identified work-life practices. We abstracted statements from the dataset and categorised them into a set of high-level thematic codes, representing how the practices were promoted by MVI. For example, we coded the statement "Blocking at least 2 hours for focused work each day can help you get more done in less time" [First Author's MVI Dashboard] as 'emphasising instrumental benefits' and the statement "Cancel meetings a day ahead so that attendees can optimally repurpose that time" (Microsoft, 2022) as 'emphasising respect towards others'. We then relied on the literature on change management strategies in organisations (e.g., Chin and Benne, 1969) to synthesis and categorise the high-level thematic codes into five categories of coregulatory approaches: 'instrumental rationalistic', 'humanistic rationalistic', 'prescriptive normalistic', 'retrospective normalistic', and 'humanistic moralistic' (see explanation in the Findings section). Next, we present the findings of our study. To protect participants' privacy, all participants have been given pseudonyms.

4 Findings

This paper theorises IPAs as coregulators (McCaslin, 2009) – agentic social actors that share and participate in workers' self-regulation of work-life practices. We found that as a coregulator, the IPA (i.e., MVI) adopted **rationalistic, moralistic, and normalistic** strategies to guide and shape personal productivity, self-care, social bonding and relationship management, and work and personal boundary management practices. We now present a detailed description of these strategies alongside participants' experiences of coregulating work-life practices with the IPA.

4.1 Adopting rationalistic strategies to coregulate work-life practices

Prior studies argue that people are rational, and once presented with information that demonstrates that a particular behaviour, action, or change is in their self-interest (Chin and Benne, 1969), they will accept the change and perform the act as a means to achieving self-interest (Szabla et al., 2017). The IPA adopted a rationalistic approach, which involves appealing to a worker's rational self-control by providing objective, data-driven suggestions backed by research-backed evidence to emphasise and justify the benefits or outcomes of a specific behaviour/action using empirical evidence. The IPA adopted two rationalistic strategies: **instrumental and humanistic rationalistic**. The **instrumental rationalistic strategy** involves providing workers with features, insights, and research-based evidence that rationally justifies a behaviour or action from an instrumental benefit perspective (e.g., efficiency and effectiveness, improved productivity). We found that the instrumental rationalistic strategy was mainly applied to **personal productivity practices** - behaviours and routines that impact the efficiency and effectiveness of work, such as time, task, meeting, and distraction behaviours. For instance, to nudge and help workers adopt better personal productivity practices (task and meeting management behaviours), the IPA offered tips and made suggestions that emphasised the benefit (efficiency and effectiveness) of blocking focus time: "blocking at least 2 hours for focused work each day can help you get more done in less time [efficiency]" [First author's Viva Insights Dashboard] and better meeting habits: "last-minute invitations are sometimes necessary, but your meetings may be more effective if you give attendees sufficient time to prepare" [effectiveness] [First Author's Viva Insights Dashboard].

Participants reported that following the IPA's suggestions improved time management, increased efficiency, and led to better meeting habits. The IPA helped workers to set goals and prioritise effort and time. Esser, a Group Lead, said: *"I think it is helping me to put my time and effort into organising what I really need to focus on"*. Participants also described how the IPA helped them effectively and efficiently schedule, prepare for upcoming meetings, and reflect on their meeting habits: *"it suggests prep time for meetings"* [Nangy] and *"brings in documents saying these look like documents related to your meeting"* [Ashley, Practice Manager]. Participants further appreciated how the IPA helped them control interruptions by turning off notifications during focus time, allowing them to concentrate on completing tasks more efficiently. *"I have that two-hour [block] booked in my calendar where I can actually do work and just get it all done without any disturbance because the best thing about focus time is, I don't get notifications until I finish the whole two hours"* [Maria, a Technical Specialist].

Unfortunately, while most participants benefited from the features and suggestions to block distractions, others expressed their inability to leverage focus time and break distracting habits due to the pace of their work and role demands: *"I think part of it is just the pace of our work, that, with [customer] service and stuff, that is kind of a habit [keeping the email application open to allow email notifications] that I haven't been able to stop"* [Tracey, Delivery Operations Coordinator]. Some expressed frustration when others ignored their time for focused work and acknowledged the negative implications of such behaviour on completing their planned tasks: *"I suppose the only difficulty I have is that if I attempt to use focus on my calendar, and it's ignored by other people, and I allow them, it can get a bit annoying because I know I've things to do during the day that I won't get a chance to do"* [Enrique, Manager: Digital Solutions]. These insights highlight the importance of effective communication and respecting time management boundaries in work settings.

The **humanistic rationalistic** strategy involves providing features, insights, and actionable suggestions that emphasise and make workers aware of the humanistic benefits or outcomes (e.g., better emotional awareness, reduced burnout and stress) of specific actions or behaviours. We found that this approach is mainly deployed to support workers in developing better **self-care and work-life boundary management practices**. *Self-care practices* include behaviours that maintain and improve emotional, mental, and physical wellbeing, such as emotional reflection, break-taking, and meditation. Work-life boundary management practices refer to behaviours and routines involved in setting and managing boundaries between work and personal life.

Participants often reported that they found it challenging to balance self-care with work demands: *"I don't have time for breaks because we don't have much free time. So, I don't have the luxury of having*

a set time for a break because of meetings" [Najus, a Group Lead]. Participants also described various experiences and challenges of maintaining self-care and work-life balance, especially during the peak of the COVID-19 pandemic and the shift to remote work: *"about six months after the whole COVID stuff started, I realised I was getting burnt out. So, I just had to set barriers like the working hours, [and] disable notifications"* [Tracey]. To help workers improve self-care and work-life balance, the IPA emphasised the humanistic outcomes of better self-care and work-life boundary practices for oneself: *"research shows that people who disconnect daily from work report lower levels of stress and higher wellbeing"* [First author's Viva Insights Dashboard]. It also offered tools and suggestions for meditating (breathing exercises, Headspace), taking lunch breaks (Outlook add-in suggestions), and setting work-life boundaries (turning off notifications after work) to foster a more balanced work-life.

Participants reported that interacting with the IPA allowed them to reflect on their self-care practices and improve their wellbeing. More specifically, they explained how the daily suggestions for reflection on their moods provided them with a moment to reflect and understand their feelings, something they had not put much effort into before the IPA appeared in their workplace. However, some participants, like Nala, mentioned using the emotional reflection emojis but expressed concerns about the potential invasion of privacy and the fear of being judged: *"I do the smiley faces, but I'm not entirely sure if anyone is recording those and judging me, so I'm always a bit worried when I do a frown or anything"*. Previous studies have found that individuals are more likely to disclose their emotions to IPAs (Lucas et al., 2014); however, this finding indicates that emotional tracking with the IPA can create tension between the benefits of self-discovery and emotional awareness and privacy concerns. This means that to fully benefit from mood-tracking features, it is important to balance openly sharing emotions, maintaining a positive image, and preserving privacy.

Other IPA's suggestions and features for supporting self-care, like breathing exercise and meditation, were well-received. Nala noted, *"I really like the one minute focusing on breathing... it's quite relaxing."* Participants further explained how features such as 'virtual commute' and 'Outlook inline suggestions' enabled them *"to separate the work life and the personal life a bit better"* [Nilyam, Group Lead] by setting work-life boundaries. *"I have it preset for 7:30 at night because I work to 8:00 PM. So, at 7:30 [PM], it's that prompt for the virtual ride home. So, it's time to start finishing up my day and tidying up any loose ends"* [Nala]. As they got accustomed to these practices, participants indicated that they no longer contemplated their day or worried about unfinished tasks while commuting home. Enrique excitedly said: *"Now, I'm automatically prompted to think about what happened during the day rather than sit on my bike on my way home thinking about what I should have done before I left the office."* Alicia, an Enterprise Data and Information Architect, described the IPA as "a good reminder" to change behaviour to focus on oneself and not just work.

Coregulation of self-care and work-life boundary management practices with the IPA was associated with improved wellbeing and productivity: *"My wellbeing is far more advanced than it was previously, where sometimes it is a struggle just to sort of not get through the day, but you're just going from one thing to another without any break, [...] certainly impacting productivity"* [Enrique]. However, despite these benefits, some participants expressed the need to stay connected and be available to their team members. Participants, particularly those in leadership positions, expressed conflicted feelings about putting boundaries between their work and personal lives because of their roles. *"I just feel responsible as a leader, that I always need to be available for my people. [...]. I find it almost, in a way, it's more relaxing to stay in touch and know what is happening"* [Nala]. This insight suggests that certain groups of workers can be disadvantaged from benefitting from these systems, inevitably creating design challenges to ensure equitable access and use of these systems.

4.2 Adopting a moralistic strategy to coregulate work-life practices

We found that the IPA used a **humanistic moralistic** strategy to influence, shape, and guide work-life practices. This approach makes workers aware of their (in)appropriate behaviour towards others and motivates and encourages them to do right by others. While morality does not necessarily have to involve others, we opted for a definition of morality that involves others because the IPA's suggestions

and recommendations to workers were mainly focused on coworkers. The humanistic moralistic strategy can be seen as drawing heavily on the Golden Rule, which is popularly described as "do unto others as you would have them do unto you" or metaphorically as "putting yourself in someone else's shoe" (Baumrin, 2004, p. 397). It signifies behaviours and acts that show kindness, care, empathy, respect, and prioritise the needs of others (Corazzini et al., 2005; Huang, 2005). For instance, the IPA nudged workers to consider the impact of their after-hour work behaviours on the wellbeing of coworkers: "send this email when most recipients are in their work hours" [First Author's Outlook Inline Suggestions] to "minimise disruptions to recipients outside their working hours or when they're away from work. It helps anybody who wants to maintain the flexibility to work when they want without putting the burden of their schedule on others" (Microsoft, 2022). Moreover, it reminded workers to always keep their collaborators in mind when organising collaborative sessions, which has implications for their productivity practices (meeting management): "make sure you give people enough time to prepare for meetings" [First Author's Monthly Digest Email].

We found that the IPA adopted a humanistic moralistic approach to coregulate mainly **work-life boundary management and social bonding and relationship management practices**. *Social bonding and relationship management practices* are routines or behaviours that build and nurture interpersonal relationships and foster a positive work environment. Participants reported how features such as inline nudges and suggestions (e.g., delay email delivery) encouraged them to consider and prioritise the work-life balance of coworkers. Ashley, for instance, described how the IPA helped him change his after-hours work habits and not pressure others by sending messages outside standard working times: "*it has caused me to change a couple of habits*" [...], *making sure that I make active use of the delayed email sending if at all possible, for people outside of business hours so that I don't wake them up or make them think that there's something urgent that they need to deal with, but it's not truly urgent.*" The IPA was also described as helping workers, particularly those in leadership positions, be more conscious of potential biases in team interactions, preventing them from "*falling into just catching up with the same people in the team more than others [because it is] not always a good thing if you are leading a team to subconsciously give certain people more time than others*" [Esser].

However, we found that the IPA had the potential to lead to self-criticism and negative emotions when its moralistic suggestions conflicted with what workers considered the "right thing" to do. Becky, a Practice Manager, recounted: "*it scares me when it tells me you respond too quickly to your emails, and you know, consider only looking at them every so often*". Also, while participants described features and suggestions such as "Praise" that prompted them to "show gratitude to peers who went above and beyond at work" [First Author's Viva Insights Dashboard] as "brilliant", they cautioned that overusing it might result in praise becoming less meaningful, while underusing it may lead to some workers feeling underappreciated. This insight calls for the responsible and balanced use of IPAs.

4.3 Adopting normalistic strategies to coregulate work-life practices

With this strategy, the IPA encouraged workers to adopt what it viewed as ideal behaviours or norms in a workplace setting. The normalistic approach can be seen as relating to Chin and Benne's (1986) normative re-educative strategy, which perceives people as social beings influenced by social norms and expectations. Thus, changing their behaviours requires not only rational processing (as with rationalisation) but also a re-evaluation of habits, values, roles, and cognitive and perpetual orientations (Quinn and Sonenshein, 2007). We found that the IPA used **prescriptive and retrospective normalistic** strategies to guide, challenge, and shape all four identified work-life practices. These strategies assume that workers actively search for satisfaction and self-fulfillment (Sjöklint et al., 2013; Stein et al., 2019). Thus, if provided with feedback on past work patterns, workers will reflect, adopt the suggested behaviours or develop strategies to address shortcomings or maintain the desired behaviours. With the **prescriptive normalistic** strategy, the IPA directed or stipulated desired norms or course of action that workers should adopt and normalise in their work practice. The IPA framed and offered normative suggestions, referencing empirical research evidence and social rules, best practices and standards of conduct (Lubetkin, 2021; Microsoft, 2022). For example, regarding *social bonding and relationship*

management practices, the IPA suggested and provided workers with the ability to set daily praise reminders and one-on-one meetings with coworkers. While participants did not always use these features or adopted the suggestions, they still found them beneficial for maintaining positive relationships in the workplace and expressing gratitude to their colleagues. Enrique stated, "*a prompt came through rather at the end of the day to ask me if I wanted to praise any of my staff for the day. I found that I didn't use it all the time. But, when they've had a particularly good day on something, I do use it to just say my thanks*".

Regarding *personal productivity practices*, the IPA suggested that workers block time in their calendars for focused work: "while your calendar is more flexible, consider scheduling time for focused work" [First Author's Viva Insights Dashboard]. Some participants explained how they adopted the IPA's suggestions and automated their focus time, making it a regular part of their daily work-life: "*I've got it set up so that my focus time is automatically put in*" [Nangy, Information Specialist]. However, the concept of focus time was not ideal for everyone. Although participants appreciated its availability, they often faced challenges implementing it due to their busy schedules and numerous meetings, rendering the feature less useful for their roles. Kyle, an Applications Support Manager, noted: "*booking focus time is great in theory, but ... with my packed calendar, the suggested slots often overlap with existing meetings. ... In my current role, I manually schedule focus time to better manage my workload.*" This highlights that IPAs must be adaptable and flexible to cater to individual preferences and job demands to normalise work behaviours effectively.

For *work-life boundary management and self-care practices*, the IPAs provided suggestions and tools to set up delayed delivery plans, automatically book time for lunch breaks and recommend short breaks for mindfulness. Some participants like Nala, Enrique and Kyle embraced these suggestions and religiously set daily reminders to wrap up their workday or take breaks: "*I have a regular appointment for my lunch break... booked into my calendar for four out of five days of the week*" [Kyle]. However, others preferred not to reserve break times to maintain flexibility for colleagues seeking meeting slots. Those in leadership positions, like Najus, indicated that they do not even consider taking breaks due to workload: "*I don't have time for breaks because we don't have high free time. So, I don't have the luxury of having a set time for a break because of meetings*". Interestingly, we also found some participants did not appreciate what they saw as the IPA's meddling in their self-care practices. One participant profusely expressed annoyance and irritation towards the IPA: "*I am not setting quiet times or do not disturb... I am not setting any notifications. Whatever little tips there are, I am not setting that in the system. So, I would just completely ignore them. Like, my wellbeing is fine. I don't need somebody telling me how many [quiet] days I've got*" [Aili, an Information Specialist]. These findings highlight the differences in self-care and work-life boundary management practices as influenced by the nature of professional roles and individual personalities, and raise questions about the effectiveness of one-size-fits-all strategies for normalising behaviours in a diverse workforce.

By adopting the **retrospective normalistic strategy**, the IPA encouraged workers to change "undesirable" work habits by providing feedback on past behaviours and encouraging self-awareness and reflection. This approach involves the IPA as a coregulator facilitating experience-based learning or change, helping workers learn from their experiences, which can lead to behaviour modification. The IPA analysed workers' work behaviours, including meetings and collaboration patterns and provided workers with detailed feedback and actionable insights to reflect on and make conscious changes. For instance, regarding work-life boundary management practices, the IPA offered feedback on workers' after-hours work habits to help them identify when they may be overworking and suggested time and task prioritisation: "Last week, you worked on 8 cloud documents outside your working hours. Protect time during the workday to make progress on important documents" [First Author's Monthly Digest Email]. Participants described the IPA as a "validation tool", providing "a quick overview" and helping them know "what is worth following up on". For most participants, reflecting on their behavioural insights provided feelings of "satisfaction" and "completion". Participants like Amy, a Senior Business Analyst and Becky appreciated the self-retrospective aspect of the IPA as it prompted them to "think differently" about how they worked and identify areas for improvement. As a validation tool, the IPA allowed participants, especially those in collaborative roles, to confirm that they were spending the right

amount of time with the right people. As one participant noted, *"it's really important to me to know that I'm working with people as much as I should be like. You know, a lot of my job is to work with people, and if I'm not, then I need to up that"* [Nangy]. Participants described how the retrospective insights helped them improve how they worked, managed relations and collaborated. Esser, for example, found that the IPA helped him identify biases in team interactions, making him "conscious" of distributing their time more evenly among team members.

The personal insights were seen as a tool for identifying areas for improvement, such as reducing meeting time, improving time management, and increasing focus on essential tasks. Philly, a Group Lead, shared his experience of how the IPA helped him identify issues in how he spent time with colleagues. He revealed that by engaging with the collaboration insights, he found that some people were taking a disproportionate amount of his time, which affected his ability to complete tasks and spend time with other colleagues: *"What I saw was the sheer weight of time [allocated to some collaborators], but I immediately reflected on those points of frustration of what I hadn't been able to get done, or who I hadn't been able to spend time with, that I had intended to. So that immediately struck a chord of 'Houston, I have a problem. The problem is me because now you [the IPA] pointed it out. Yes, I know it felt like it, but now I can see it."* However, using normalistic approaches may face challenges in recognising the unique context of each user's work environment. Participants expressed scepticism about the insights and questioned their depth, accuracy (e.g., counting non-meetings as meetings leading to unreliable recommendations) and reliability. As Lola, an Enterprise Information and Knowledge Management Manager, pointed out, the IPA offered a limited, "filtered view" that may lead to a "reductionist perspective", affecting judgments and encouraging different and conflicting ways of working. We also found constant and persistent interactions (i.e., IPA notifications and reminders) were seen as a source of information overload and counterproductive.

5 Discussion and Implications

Our analysis found that the IPA adopted various strategies to coregulate worker's personal productivity, self-care, social bonding and relationship management and work-life boundary management practices. These practices are interconnected, as one practice influences the effectiveness of the others, which supports previous findings (Cranefield et al., 2023). For example, the successful regulation of work-life boundary practices is dependent on the effective management of personal productivity practices. In turn, efficiently regulating productivity practices necessitates improved social bonding and relationship management, and self-care practices, all of which reciprocally impact one another. Behavioural feedback and insights on work patterns, nudges and cues embedded in workflows (e.g., email composition), educational tips, actionable suggestions, and various technological features serve as the primary vehicle through which the IPA (i.e., MVI) coregulated practices. Now we will discuss the general implications of the role and agency of IPAs as coregulators.

To support the regulation of work-life practices, the IPA adopted three roles: **rationalist, normalist and moralist**. The IPAs' agency as *rationalists* lies in their ability to shape, influence and guide behaviours using approaches that rationalise and emphasise the instrumental and humanistic benefits and outcomes. The study highlights the potential benefits of IPAs as rationalists, such as enhanced productivity and time management and increased wellbeing and satisfaction. However, our findings indicate that workers often struggled to leverage benefits associated with some suggestions, such as focus time or silencing notifications due to work demands or role expectations, leading to frustration or burnout. Workers in collaborative roles, such as software developers and business analysts, indicated not benefitting much from these features and suggestions because their job involved collaboration and assisting team members, making it difficult to block off notifications for extended periods. This suggests that one-size-fits-all IPAs (He et al., 2010) cannot fully cater to the complexity and diversity of individuals' workplace needs and challenges. We also found that IPAs' suggestions could lead to conflict and frustration among workers when some workers want to adopt the suggestions and guidance provided by the IPA, but coworkers ignore or disregard them. In addition, we found that despite privacy assurance (MVI clearly indicated that personal insights are private), workers still expressed concerns about privacy and data

being used to judge them, which might make workers feel pressured to present a certain image. They also questioned where their data was stored or going. If these issues are not addressed, some workers will inadvertently be disadvantaged and excluded from the wellbeing and productivity benefits that IPAs are designed to offer. AI designers and organisations need to ensure that IPAs are equally accessible and effective for all workers to benefit. In doing so, AI designers need to balance technology reliance and autonomy, as overreliance on IPAs may impact workers' abilities to self-regulate independently, which goes against the goals of coregulation (McCaslin, 2009). IPAs designers and organisations should also establish clear data privacy boundaries to ensure that IPAs are used to support rather than monitor or judge workers to address the tension between privacy, self-discovery, and awareness.

IPAs as *moralists* guide moral behaviour to promote a healthier work environment, emphasising kindness, care, and respect. Our findings corroborate previous studies which found that IPAs promote humanistic goals by framing activities in ways that consider workers' behavioural impact on coworkers and offering insights for personal improvement and consideration of others (Cranefield et al., 2022; Papachristos et al., 2021). We found that such guidance has the potential to improve interpersonal relationships and potentially better team dynamics. However, we also found that moralistic mechanisms could negatively affect workers and the workplace. According to dyadic morality theory, an act is judged based on norm violations, negative affect, and perceived harm (Schein and Gray, 2018). IPAs cannot fully judge a worker's behaviour or actions based on these criteria. This is because IPAs do not fully understand the work context and the intentions behind actions. While their suggestions are based on social norms or best practices (Patton, 2021), they do not always align with what is considered appropriate in a specific situation. For instance, while the IPA implied that sending coworkers emails outside their work hours was inconsiderate and showed a lack of respect towards people's personal time, participants counterargued that, sometimes, sending emails after hours was necessary if there was an issue critical to business operations. Therefore, we argue that there is a need to exercise caution and moral judgment when following IPA's suggestions. Workers also need to have good knowledge of institutional practices to avoid the negative consequences of taking IPA's suggestions at face value.

Our findings further revealed that, in some instances, moralistic suggestions led to self-criticism and negative emotions. Scholars have argued that AI should be a source of empowerment and wellbeing (Asatiani et al., 2021), not self-distraction. AI designers and researchers should consider the challenges and opportunities of embedding and guiding "moral values" with IPAs (van de Poel, 2020) to minimise the adverse effects and maximise the benefits. For instance, by providing insights and suggestions on after-hours work, can the IPA cause workers to have negative self-images about themselves? Or could they be perceived by coworkers as selfish or inconsiderate because they send emails after hours? Will workers consider themselves workaholics with unhealthy habits because the IPA frequently refers to how they cannot disconnect or how many documents they worked on during "quiet hours"? Could features and suggestions such as "Praise" make workers feel pressured to acknowledge others? What could be their implications for morale, emotional and mental wellbeing, and job satisfaction? It is crucial for AI designers and researchers to explore how to frame and communicate insights and suggestions (e.g., using familiar and appropriate terminologies and re-emphasising positive behavioural trends) (Choe et al., 2013). IS scholars should consider various theoretical lenses (e.g., CARE theory (Leidner and Tona, 2021)) to explore the implications of IPA in guiding moral behaviours and how IPAs can be designed to promote care and respect for individuals. Organisations should foster supportive and non-judgmental work cultures that encourage responsible and ethical use of IPAs.

As *normalists*, IPAs prescribe "ideal" behaviours that workers need to adopt and normalise. The IPAs also provide workers with statistical feedback and data-driven insights to retrospectively reflect and learn from their past behaviours and their implications. Our findings indicate that this approach has improved time management, enhanced self-care, stronger relationships, and better work habits. However, we also found that, as normalists, IPAs raise implications for workers and organisations. For instance, experiences like Enrique's experience of having to enforce breaks by making them visible to colleagues point to a potential issue of work culture, where workers might feel pressured to skip self-care practices (e.g., taking breaks) due to expectations or perceived norms. This means that organisations need to cultivate and promote a supportive work environment that encourages workers to respect others'

personal time. In addition, while prior research suggests that for data to effectively drive change, it must be presented accurately and communicated in an understandable way to affect change (Quinn and Sonenshein, 2007; Szabla et al., 2017). Participants in our study often referenced inaccurate data or inappropriate use of terminologies. They repeatedly questioned or doubted the insights presented by the IPA and did not understand the terminologies (e.g., "focus time" or "quiet days") used to describe some practices. As a result, participants either ignored or rejected the IPA's suggestions. In some cases, participants did not consider the IPA as a reliable source of information for decision-making and behaviour change. However, when the data was perceived as accurate, workers fully engaged with the IPA and reported benefits and changes in behaviour. These insights suggest that the IPA's effectiveness in normalising behaviours may be contingent on the accuracy and reliability of the insights it presents.

Moreover, while coregulation underlines the importance of reciprocity (McCaslin, 2009), the IPA in this study lacked an appropriate feedback loop for workers to give it feedback. Workers can only provide basic feedback to MVI using the thumbs up/down buttons and configure their working days, hours, and time zones, which guides the IPA in analysing behaviours and providing suggestions. As a result, participants often complained that the suggestions offered conflicted with their ways of working, as the IPA cannot fully comprehend their work contexts to provide accurate and reliable insights and recommendations. As work habits and practices are largely contextual (White and Awadallah, 2019; Whittington, 2006), IPAs' agency in prescribing normative behaviours may be restricted by its inability to understand the context and intentions behind human actions. We suggest that AI designers need to provide interfaces for workers to journal and add descriptive information about their work within the IPA (e.g., Avrahami et al., 2020; Kocielnik et al., 2018) so that the IPAs can incorporate such data into behavioural insights and suggestions but also learn from it (Grønsund and Aanestad, 2020). Enhancing the accuracy and reliability of the IPA's insights may sustain worker engagement, ultimately making IPAs effective coregulators.

6 Conclusion and Contribution

AI systems, like IPAs, are increasingly being integrated into daily work life. Our study aimed to understand how IPAs participate and share in regulating daily work-life practices. As a coregulator, IPA in this study guided, influenced, and shaped personal productivity, self-care, social bonding and relationship management, and work-life boundary management practices. The IPA adopted various approaches to regulating these practices, positioning itself as rationalist, moralist, and normalist. Our findings support the view that IPAs are not merely tools but are agentic IS that can influence work and social behaviours (Baird and Maruping, 2021; Meske et al., 2022). It is important to emphasise that what we see in this study is not the result of AI-per se, but rather demonstrates how AI systems, when guided by human morality and normative design decisions (van Berkel et al., 2022) can exert pervasive and powerful coregulatory influence on human practices. While we have only studied a single IPA, our research contributes to the IS literature on human-AI collaboration in organisations by integrating the perspective of human-IPA coregulation of work-life practices. Our findings offer valuable insights for practitioners and AI developers seeking to improve the design, implementation, and management of IPAs as well as for scholars interested in exploring the broader implications of AI on human behaviours at work. By building on and expanding the existing literature, we hope to spark further conversations and investigations into the evolving relationships between humans and emerging IPAs in the workplace.

References

- Ågerfalk, P. J. (2020). "Artificial intelligence as digital agency", *European Journal of Information Systems*, 29 (1), 1–8.
- Anderson, L. (2006). "Analytic autoethnography", *Journal of Contemporary Ethnography*, 35 (4), 373–395.
- Asatiani, A., Malo, P., Nagbøl, P. R., Penttinen, E., Rinta-Kahila, T., and Salovaara, A. (2021). "Sociotechnical envelopment of artificial intelligence: an approach to organizational deployment of

- inscrutable artificial intelligence systems", *Journal of the Association for Information Systems*, 22(2), 325–352.
- Ashton, H., and Franklin, M. (2022). "The problem of behaviour and preference manipulation in AI systems", (Online).
- Avrahami, D., Williams, K., Lee, M.L., Tokunaga, N., Tjahjadi, Y. and Marlow, J. (2020). "Celebrating Everyday Success: Improving Engagement and Motivation using a System for Recording Daily Highlights", *Conference on Human Factors in Computing Systems*, Hawaii, USA.
- Baird, A. and Maruping, L.M. (2021). "The next generation of research on is use: A theoretical framework of delegation to and from agentic is artifacts", *MIS Quarterly*, 45 (1), 315–341.
- Baumrin, S.B. (2004). "The shoes of the other", *Philosophical Forum*, 35 (4), 397–410.
- Bergen, P. (2017a). *MyAnalytics – Productivity tips and updated visualisation*. Microsoft Mechanics. URL: https://www.youtube.com/watch?v=D808ojB5Dyo&ab_channel=MicrosoftMechanics
- Bergen, P. (2017b). *New in MyAnalytics: long-term trends, network maps, time spent with Groups, and more*, URL: <https://techcommunity.microsoft.com/t5/workplace-analytics-myanalytics/new-in-myanalytics-long-term-trends-network-maps-time-spent-with/ba-p/109372> (visited on September 30, 2021).
- Berninger, N. M., ten Hoor, G. A., Plasqui, G., Kok, G., Peters, G. J. Y., and Ruiter, R. A. C. (2020). "Sedentary work in desk-dominated environments: a data-driven intervention using intervention mapping", *JMIR Formative Research*, 4 (7).
- Braun, V. and Clarke, V. (2006). "Using thematic analysis in psychology", *Qualitative Research in Psychology*, 3 (2), 77–101.
- Chin, R. and Benne, K.D. (1969). *General strategies for effecting changes in human systems*. Boston, MA: Human Relations Center, Boston University.
- Choe, E.K., Lee, B., Munson, S., Pratt, W. and Kientz, J.A. (2013). "Persuasive performance feedback: the effect of framing on self-efficacy", *AMIA Symposium*, Washington, USA.
- Cliff, S. (2018). *Microsoft warns if an email is being sent out of office hours*. URL: <https://www.computerweekly.com/news/252444894/Microsoft-warns-if-an-email-is-being-sent-out-of-office-hours> (visited on September 20, 2021).
- Corazzini, K.N., Lekan-Rutledge, D., Utley-Smith, Q., Piven, M.L., Colón-Emeric, C.S., Bailey, D., Ammarell, N., et al. (2005). "'The Golden Rule': Only a starting point for quality care", *Directors*, 14 (1), 255–293.
- Cranefield, J., Doyle, C., and Ekandjo, T. (2023). "Using Instrumental Mechanisms to Support Humanistic Goals: The Case of Two Intelligent Personal Assistants", *Hawaii International Conference on System Sciences*, Hawaii, USA.
- Cranefield, J., Winikoff, M., Chiu, Y.-T., Li, Y., Doyle, C., and Richter, A. (2022). "Partnering with AI: the case of digital productivity assistants", *Journal of the Royal Society of New Zealand*, 1–24.
- Creswell, J.W. (2007). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, 2nd ed., SAGE Publications, Inc., Thousand Oaks.
- Ekandjo, T., Cranefield, J., and Chiu, Y.-T. (2020). "The Emergence of Perpetual Performance Management in the Workplace : Implications and Research Agenda", *Australasian Conference on Information Systems*, Wellington, New Zealand.
- Etikan, I., Musa, S.A., and Alkassin, R.S. (2016). "Comparison of Convenience Sampling and Purposive Sampling", *American Journal of Theoretical and Applied Statistics*, 5 (1), 1–4.
- Faraj, S., Pachidi, S., and Sayegh, K. (2018). "Working and organizing in the age of the learning algorithm", *Information and Organization*, 28 (1), 62–70.
- Fügener, A., Grahl, J., Gupta, A., and Ketter, W. (2021). "Will humans-in-the-loop become borgs? merits and pitfalls of working with AI", *MIS Quarterly*, 45 (3), 1527–1556.
- Gambino, A., Fox, J. and Ratan, R. (2020). "Building a Stronger CASA: Extending the Computers Are Social Actors Paradigm", *Human-Machine Communication*, 1, 71–86.
- Grønsund, T., and Aanestad, M. (2020). "Augmenting the algorithm: Emerging human-in-the-loop work configurations", *Journal of Strategic Information Systems*, 29 (2), 101614.
- Grover, T., Rowan, K., Suh, J., McDuff, D. and Czerwinski, M. (2020). "Design and evaluation of intelligent agent prototypes for assistance with focus and productivity at work", *International*

- Conference on Intelligent User Interfaces*, Cagliari, Italy.
- Hadwin, A. (2004). "Socially Shared Regulation : Exploring Perspectives of Social in Self-Regulated Learning Theory", 113 (2), 235–239.
- He, H. A., Greenberg, S., and Huang, E. M. (2010). "One size does not fit all: Applying the transtheoretical model to energy feedback technology design", *Conference on Human Factors in Computing Systems*, Atlanta, Georgia, USA.
- Heritage, M. (2016). "Assessment for Learning: Co-Regulation in and as Student–Teacher Interaction", *Enabling Power of Assessment*, 4, 327–343.
- Hern. (2020). *Microsoft Productivity Score Feature Criticised as Workplace Surveillance*. URL: shorturl.at/koH45 (visited on May 15, 2021).
- Hildebrandt, M. (2019). "The Issue of Bias. The Framing Powers of ML", *SSRN Electronic Journal*.
- Huang, Y. (2005). "A Copper Rule versus the Golden Rule: A Daoist-Confucian Proposal for Global Ethics", *Philosophy East and West*, 55 (3), 394–425.
- Jackman, J. M., and Strober, M. H. (2003). "Fear of Feedback", *Harvard Business Review*, 81 (4).
- Jain, H., Padmanabhan, B., Pavlou, P. A., and Raghuram, T. S. (2021). "Editorial for the special section on humans, algorithms, and augmented intelligence: The future of work, organizations, and society", *Information Systems Research*, 32 (3), 675–687.
- Janardhan, K. (2019). *Minimize distractions and stay focused with AI-powered updates in Microsoft 365*. URL: <https://www.microsoft.com/en-us/microsoft-365/blog/2019/05/06/minimize-distractions-stay-focused-ai-powered-updates-in-microsoft-365> (visited on May 15, 2021).
- Järvenoja, H., Järvelä, S., and Malmberg, J. (2020). "Supporting groups' emotion and motivation regulation during collaborative learning", *Learning and Instruction*, 70 (November 2017), 101090.
- Jarzabkowski, P., Balogun, J. and Seidl, D. (2007). "Strategizing: The challenges of a practice perspective", *Human Relations*, 60 (1), 5–27.
- Kaplan, A., and Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence *Business Horizons*, 62 (1), 15–25.
- Kimani, E., Rowan, K., McDuff, D., Czerwinski, M. and Mark, G. (2019). "A Conversational Agent in Support of Productivity and Wellbeing at Work", *International Conference on Affective Computing and Intelligent Interaction Workshops and Demos*, Cambridge, UK.
- Klein, H.K. and Myers, M.D. (1999). "A set of principles for conducting and evaluating interpretive field studies in information systems", *MIS Quarterly*, 23 (1), 67–94.
- Kocielnik, R., Avrahami, D., Marlow, J., Lu, D. and Hsieh, G. (2018). "Designing for workplace reflection: A chat and voice-based conversational agent", *Designing Interactive Systems Conference*, Hong Kong, China.
- Korteling, J. E. (Hans., van de Boer-Visschedijk, G. C., Blankendaal, R. A. M., Boonekamp, R. C., and Eikelboom, A. R. (2021). "Human versus Artificial Intelligence", *Frontiers in Artificial Intelligence*, 4 (March), 1–13.
- Lanamäki, A., Väyrynen, K., Laari-Salmela, S. and Kinnula, M. (2020). "Examining relational digital transformation through the unfolding of local practices of the Finnish taxi industry", *Journal of Strategic Information Systems*, 29 (3).
- Leidner, D.E. and Tona, O. (2021). "The care theory of dignity amid personal data digitalization", *MIS Quarterly*, 45 (1), 343–370.
- Lobo, F. M., and Lunkenheimer, E. (2011). "Understanding the Parent-Child Coregulation Patterns Shaping Child Self- Regulation", *Developmental Psychology*, 1–279.
- Lomborg, S. (2022). "Everyday AI at Work", *Everyday Automation*, 126–139.
- Lubetkin, A. (2021). *New Viva Insights capabilities help foster wellbeing and productivity across a hybrid work culture*. URL: <https://techcommunity.microsoft.com/t5/microsoft-viva-blog/new-viva-insights-capabilities-help-foster-wellbeing-and/ba-p/2901378> (visited on May 15, 2021).
- Lucas, G. M., Gratch, J., King, A., and Morency, L. P. (2014). "It's only a computer: Virtual humans increase willingness to disclose", *Computers in Human Behavior*, 37, 94–100.
- Markus, M. L. (2017). "Datification, Organizational Strategy, and IS Research: What's the Score? *Journal of Strategic Information Systems*, 26 (3), 233–241.

- McCaslin, M. (2009). "Co-regulation of student motivation and emergent identity", *Educational Psychologist*, 44 (2), 137–146.
- McCaslin, M., Good, T. L., Nichols, S., Zhang, J., Wiley, C. R. H., Bozack, A. R., Burross, H. L., and Cuizon-Garcia, R. (2006). "Comprehensive school reform: An observational study of teaching in grades 3 through 5", *Elementary School Journal*, 106 (4), 313–331.
- Meske, C., Bochum, R., Kuss, P.M., Meske, C. and Bochum, R. (2022). "Theorizing the Concept of Agency in Human-Algorithmic Ensembles with a Socio-Technical Lens", *International Conference on Information Systems*, Copenhagen, Denmark.
- Microsoft. (2022). *Personal Insights*. URL: <https://learn.microsoft.com/en-us/viva/insights/> (visited on June 11, 2022).
- Fuller, R. (2016). *Introducing MyAnalytics in Office 365*. Microsoft Mechanics. URL: https://www.youtube.com/watch?v=43i-IXo4wN8&ab_channel=MicrosoftMechanics (visited on August 20, 2021).
- Molenaar, I. (2022). "The concept of hybrid human-AI regulation: Exemplifying how to support young learners' self-regulated learning", *Computers and Education: Artificial Intelligence*, 3 (April), 100070.
- Moreno, J., Sanabria, L. and López, O. (2016). "Theoretical and Conceptual Approaches to Co-Regulation: A Theoretical Review", *Psychology*, 07 (13), 1587–1607.
- Murray, A., Rhymer, J., and Sirmon, D. G. (2021). "Humans and technology: Forms of conjoined agency in organizations", *Academy of Management Review*, 46 (3), 552–571.
- Newell, S., and Marabelli, M. (2015). "Strategic opportunities (and challenges) of algorithmic decision-making: A call for action on the long-term societal effects of 'datification'", *Journal of Strategic Information Systems*, 24 (2015), 3–14.
- Nowell, L.S., Norris, J.M., White, D.E. and Moules, N.J. (2017). "Thematic Analysis: Striving to Meet the Trustworthiness Criteria", *International Journal of Qualitative Methods*, 16 (1), 1–13.
- Orlikowski, W.J. and Iacono, C.S. (2001). "Research Commentary: Desperately Seeking the 'IT' in IT Research - A Call to Theorizing the IT Artifact", *Information Systems Research*, 12 (2), 121–134.
- Papachristos, E., Meldgaard, D. P., Thomsen, I. R., and Skov, M. B. (2021). "ReflectPal: Exploring Self-Reflection on Collaborative Activities Using Voice Assistants", *IFIP Conference on Human-Computer Interaction*, Bari, Italy.
- Patrick, H. and Middleton, M.J. (2002). "Turning the kaleidoscope: What we see when self-regulated learning is viewed with a qualitative lens", *Educational Psychologist*, 37 (1), 27–39.
- Patton, S. (2021). *Microsoft Viva Insights helps people nurture wellbeing and be their best*. URL: <https://tinyurl.com/yckjpnse> (visited on December 02, 2021).
- Pintrich, P.R. (2000). "The Role of Goal Orientation in Self-Regulated Learning", in: *Handbook of Self-Regulation*, 451–502.
- Quinn, R.E. and Sonenshein, S. (2007). "Four General Strategies for Changing Human Systems", *The Nature of Organization Development*, 69–78.
- Rai, A., Constantinides, P., and Sarker, S. (2019). "Next-Generation Digital Platforms: Toward Human-AI Hybrids", *MIS Quarterly*, 43 (1), iii–ix.
- Reckwitz, A. (2002). "Toward a theory of social practices: A development in culturalist theorizing", *European Journal of Social Theory*, 5 (2), 245–263.
- Sarker, S., Xiao, X., Beaulieu, T. and Lee, A.S. (2018). "Learning from first-generation qualitative approaches in the is discipline: An evolutionary view and some implications for authors and evaluators (part 1/2)", *Journal of the Association for Information Systems*, 19 (8), 752–774.
- Schafer, P. (2021). *Introducing Microsoft Viva Insights: Create a culture where people and business can thrive*. URL: <https://tinyurl.com/yavjmuax> (visited on May 15, 2021).
- Schafheite, S., Weibel, A. and Rickert, A. (2021). "The Bermuda Triangle of Leadership in the AI Era? Emerging Trust Implications From 'Two-Leader-Situations' in the Eyes of Employees", *Hawaii International Conference on System Sciences*, Hawaii, USA.
- Schein, C. and Gray, K. (2018). "The Theory of Dyadic Morality: Reinventing Moral Judgment by Redefining Harm", *Personality and Social Psychology Review*, 22 (1), 32–70.
- Schuetz, S. and Venkatesh, V. (2020). "Research perspectives: The rise of human machines: How

- cognitive computing systems challenge assumptions of user-system interaction", *Journal of the Association for Information Systems*, 21 (2), 460–482.
- Sjöklint, M., Constantiou, I. and Trier, M. (2013). "Numerical representations and user behaviour in social networking sites: Towards a multi-theoretical research framework", *European Conference on Information Systems 2013*, Utrecht, Netherlands.
- Stein, M.K., Wagner, E.L., Tierney, P., Newell, S. and Galliers, R.D. (2019). "Datification and the Pursuit of Meaningfulness in Work", *Journal of Management Studies*, 56 (3), 685–717.
- Sowa, K., Przegalinska, A., and Ciechanowski, L. (2021). "Cobots in knowledge work: Human – AI collaboration in managerial professions", *Journal of Business Research*, 125, 135–142.
- Strich, F., Mayer, A. S., and Fiedler, M. (2021). "What do i do in a world of artificial intelligence? Investigating the impact of substitutive decision-making ai systems on employees' professional role identity", *Journal of the Association for Information Systems*, 22(2), 304–324.
- Szabla, D.B., Pasmore, W., Barnes, M.A. and Gipson, A.N. (2017). "Robert Chin and Kenneth D. Benne: Change Management Biography", in: *The Palgrave Handbook of Organizational Change Thinkers*, 1–1533.
- Tarafdar, M., Page, X. and Marabelli, M. (2022). "Algorithms as co-workers: Human algorithm role interactions in algorithmic work", *Information Systems Journal*, April, 1–36.
- van Berkel, N., Tag, B., Goncalves, J. and Hosio, S. (2022). "Human-centred artificial intelligence: a contextual morality perspective", *Behaviour and Information Technology*, 41 (3), 502-578.
- van de Poel, I. (2020). "Embedding Values in Artificial Intelligence (AI) Systems", *Minds and Machines*, Springer Netherlands, 30 (3), 385–409.
- van den Berg, L., and Surujlal, J. (2020). "The Relationship Between Coach Guidance, Feedback, Goal Setting, Support and a Long-Term Development Focus of University Athletes", *International Journal Of Social Sciences And Humanity Studies*, 12 (2), 1309–8063.
- van den Broek, E., Sergeeva, A., and Huysman, M. (2020). "Hiring algorithms: An ethnography of fairness in practice", *International Conference on Information Systems*, Munich, Germany.
- Vlaev, I., King, D., Dolan, P., and Darzi, A. (2016). "The Theory and Practice of "Nudging": Changing Health Behaviors", *Public Administration Review*, 76 (4), 550–561.
- Vryan, K. D. (2006). "Expanding Analytic Autoethnography and Enhancing Its Potential", *Journal of Contemporary Ethnography*, 35 (4), 405–409.
- Walsham, G. (1995). "Interpretive case studies in IS research: Nature and method", *European Journal of Information Systems*, 2, 74–81.
- White, R.W. and Awadallah, A.H. (2019). "Task duration estimation", *Proceedings of the 12th ACM International Conference on Web Search and Data Mining*, pp. 636–644.
- Whittington, R. (2006). "Completing the practice turn in strategy research", *Organization Studies*, 27 (5), 613–634.
- Williams, A.C., Kaur, H., Mark, G., Thompson, A.L., Iqbal, S.T. and Teevan, J. (2018). "Supporting workplace detachment and reattachment with conversational intelligence", *Conference on Human Factors in Computing Systems*, Montreal, Canada.
- Winikoff, M., Cranefield, J., Li, J., Richter, A., and Doyle, C. (2021). "The Advent of Digital Productivity Assistants: The Case of Microsoft MyAnalytics", *Proceedings of the 54th Hawaii International Conference on Systems Sciences*, Hawaii, USA.
- Zimmerman, B.J. (2000). "Attaining Self-Regulation: A Social Cognitive Perspective", in: *Handbook of Self-Regulation*, Academic Press, 13–39.