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Collaborating with Generative AI: Exploring Algorithm Appreciation in Creative Writing

Short Paper

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Abstract

Generative AI (GenAI) has recently attracted a tremendous amount of public attention showcasing the transformational capacity that AI-based systems have on society. By generating creative outputs in multimodal formats like texts and images, GenAI is entering domains formerly seen exclusive to human ingenuity. This raises concerns about how working with AI-based systems will affect employees. Existing research on human-AI collaboration is focusing on objective decision-making settings. We contribute to the arowing IS research stream that considers AI collaboration on creative tasks. In particular, we conduct an online experiment to see whether employees appreciate GenAIgenerated creative texts and how personality traits affect this interaction. We find that getting input from GenAI rather than a colleague relates to fewer modifications performed to the draft. This relationship is moderated by conscientiousness suggesting that conscientious employees are less inclined to accept suggestions and hence may not gain as much from GenAI tools.

Keywords: Generative artificial intelligence, human-AI collaboration, creativity, text writing, conscientiousness

Introduction

The public release of ChatGPT in November 2022 attracted widespread media attention and gave users a first-time easy access to a technology with capabilities not previously attributed to artificial intelligence (AI). ChatGPT belongs to the growing class of transformer-based large language models, that can generate new and distinct output in response to "prompts" provided by the user. The novel characteristic of Generative AI (GenAI) is that it creates outputs with human-like creativity in a wide variety of formats, such as text, graphics, audio, and video – domains so far regarded as exclusive to humans (Benbya et al. 2021). GenAI's broad variety of potential use cases, particularly in organizations, raises the question about the impact on employees collaborating with these new AI-based systems.

From a conceptual point of view, GenAI describes a problem instance that, in abstraction, captures the shift in cooperation between human and nonhuman actors (Gregor et al. 2020). This agential shift highlights the need for a conceptual solution to account for emerging properties of AI and the way in which employees leverage them (Baiyere et al. 2023). While much research in information systems (IS) highlights the benefits of AI for employees, such as greater efficiency in decision-making and organizational learning (see Kellogg et al. 2020), the collaboration between humans and algorithms is also prone to problems. One reason is that AI generates recommendations and resources for the work of employees (Schildt 2020), thereby risking to replace and devalue employees' skills (Pachidi et al. 2021), impacting their identities (Strich et al. 2021), and even (re)defining an organization's value proposition (Wessel et al. 2021). Moreover, AI reconfigures employer-worker relations as it enables employers to use algorithms to control workers, leading to conflict within the organization (Kellogg et al. 2020). Lastly, there is a low level of transparency on how AI output was generated, making it difficult for employees to understand it (Lebovitz et al. 2022). Thus, employees might either blindly accept a recommendation made by AI without questioning it or adopt it symbolically without actually using it (Fügener et al. 2021; Pachidi et al. 2021). However, as the interaction between human and nonhuman actors is required for the emergence of generative digital products (Yoo 2013), the performance of both actors is reduced. This is troublesome, as companies can only achieve a competitive advantage, when human and nonhuman actors are interconnected and support each other (Schildt 2020). Thus, there is a need to further investigate the collaboration between humans and AI. However, Schildt (2020) concludes that "fairly little systematic academic work has been conducted on the interface between advanced algorithms and human expertise". Specifically, as an increasing number of organizations integrate AI into their processes (Krogh 2018), it becomes vital to examine the factors that impact human and AI collaboration and make employees either avert or appreciate advice from AI tools.

Existing IS research on AI-assisted decision making mostly focuses outcomes of a decision that can be measured objectively, such as when an algorithm is helping an employee to find the optimal solution. GenAI, in contrast, allows for the application of AI assistance in more open-ended, imaginative tasks like writing and picture creation. Research on people collaborating with AI in creative tasks is scarce, given the relative novelty (Bogert et al. 2022; Jia et al. 2023; Siemon et al. 2022). Bao et al. (2022) are among the few to investigate the collaboration with explorative and exploitative algorithms and find that employees explore more and perform better when they receive advice from an explorative, and thus creative, algorithm. In contrast, Berente et al. (2021) state that "AI's ability of emulating human decision makers, however, has limitations, especially with regard to innovation." Thus, with so many new potential applications, but also limitations for GenAI in organizations, it is crucial to understand whether employees benefit from the use of algorithms also for creative tasks and how human AI collaboration unfolds in the creative domain (Bogert et al. 2022). Moreover, scholars call to study whether different types of employees engage with GenAI in a more beneficial way than others (Kellogg et al. 2020; Lebovitz et al. 2022).

In this regard, the role of personality traits in adopting and effectively using new technology has been a topic of interest in IS research (Devaraj et al. 2008; McElroy et al. 2007; Svendsen et al., 2013). Because it indicates a preference for an organized and systematic work style, the conscientiousness trait is an established key indicator for employee performance (Barrick et al. 1993) and it has been linked to technology usage in a workplace setting (Barnett et al. 2015). However, by drawing on complementarity theory, Tang et al. (2022) argue that features of AI tools like autonomous and systematic decision making do not benefit conscientious employees as there is a non-complementary mismatch by the opposing urge to take command and the similarly systematic intelligent machines. Despite the established relevance of individual characteristics for technology adoption (Venkatesh 2022), empirical research on the effect of personality traits in the context of collaborating with AI on creative tasks is still missing. Hence, we pose our main research question:

Research Question: Do employees show algorithm appreciation when working on creative tasks with GenAI, and how do individual personality traits influence the collaboration?

We conduct a between-subjects online experiment to see how the origin of a suggestion influences the acceptance of algorithmic advice. Participants were given a draft text to develop a creative product advertisement. The goal is to see if already framing that the draft came from an AI-enabled chatbot rather than from a colleague affects how many changes participants make to that draft. The task of creative writing represents an easy-to-understand workplace scenario and is a very common use case for GenAI tools like ChatGPT.

With this study we extend the IS literature on technology acceptance and algorithmic appreciation by making a first foray into examining a collaborative workplace setting between humans and GenAI (Venkatesh 2022). We contribute to the need for empirical contextualization of this novel application of AI for creative tasks (Bogert et al. 2022). Following the research agenda from Seeber et al. (2020) we empirically investigate the ambivalent factors of collaboration with AI in the context of creative tasks,

adding to an understanding of the influencing elements and future design suggestions for human AI collaboration. In addition, we explain GenAI as a new context, in which nonhuman and human agents collaborate, thereby highlighting the need to extend well-established concepts and theories which so far center mainly on the role of human agents (Baiyere et al. 2023).

Theoretical Background and Hypotheses

Understanding the ways in which people accept and utilize a new technology is critical for its success. Thus, the issue of whether or not collaborating with AI is beneficial for and hence accepted by organizations, employees, and ultimately society is at the center of many ongoing debates (Benbya et al. 2021; Seeber et al. 2020). AI systems have characteristics that set them apart from traditional IT and need a new research perspective: For example, the ability to automate and replace whole work processes, to remove human involvement entirely, to produce unpredictable work output based on "learned" behavior, and a lacking explainability of the decision process (Strich et al. 2021).

Within the subject of IS, extensive research on technology adoption is based on the Technology Acceptance Model (TAM) developed by Davis et al. (1989). Venkatesh et al. (2003) further developed this wellestablished framework by combining TAM and other competing theories into The Unified Theory of Acceptance and Use of Technology (UTAUT). UTAUT conceptualizes the user's expectations on performance and required effort, as well as social influence from other users, as antecedents to the behavioral intention of using a new technology. Originally targeted at the corporate context, the model has been extended into the consumer context (Venkatesh et al. 2012) and has since been used extensively in IS literature to explain how people accept a new technology (Dwivedi et al. 2019). Despite concerns that research on technology adoption has reached its limitations, there are still novel contexts not covered by UTAUT that warrant further investigation (Blut et al. 2022). This includes attributes unique to new types of technology (e.g., Brown et al. (2010) on collaboration technology), such as collaborating with GenAI.

A growing IS literature stream focuses on AI-advised human decision making in which humans receive AIbased recommendations for a complex task prior to making a final decision by themselves. Depending on context and settings, researchers across disciplines have found different user behavior in this collaboration setting. Dietvorst et al. (2015) established the concept of "algorithm aversion" to describe the phenomenon in which humans are more opposed to algorithmic suggestions after witnessing the AI-tool make a mistake, even if humans made the same mistakes. Similar tendencies have been observed for situations that require subjective decisions or when the abilities of the AI-tool appear to be unrealistic (Burton et al. 2020). In contrast, Logg et al. (2019) demonstrate the effect of "algorithm appreciation" in multiple experiments, where people are more likely to follow suggestions generated by an algorithm as opposed to a person. In some contexts in which humans collaborate with AI, research also indicates that individuals invest less effort and are more willing to delegate responsibility to their AI-based teammates (Stieglitz et al. 2022).

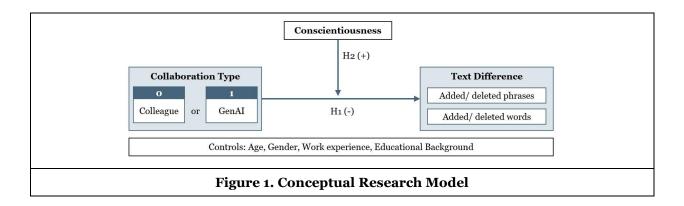
Based on the theory presented, we argue that people likely show algorithm appreciation when collaborating with AI-assisted tools on creative tasks. While we acknowledge that the actual capabilities of an AI-enabled chatbot like ChatGPT may appear unrealistic to some, we anticipate that using an AI-generated draft as a starting point for a creative writing exercise reflects a realistic working scenario for the vast majority of people. Given that users can modify the outcome in typical collaboration scenarios with GenAI, they retain control on the degree to which they accept the algorithm's recommendation. This has shown to be an important factor in overcoming algorithm aversion (Dietvorst et al. 2018). Given the popularity of ChatGPT, we anticipate that individuals welcome AI suggestions for creative tasks and consider the draft to be more applicable than a suggestion from a colleague since the AI tool is trained on a broader variety of data. In sum, we argue that in case of algorithm appreciation, individuals review a text draft more favorable (i.e., perform less edits) if they believe that the draft was written by a GenAI compared to a colleague (see Figure 1).

Hypothesis 1: Collaboration with a GenAI on a creative writing task relates to fewer changes of the provided draft text.

Following UTAUT, individual characteristics such as gender, age, and experience are considered to moderate the intention to accept a new technology (Venkatesh et al. 2003). We argue that further attributes unique to the users, specifically their personality trait of conscientiousness moderates the relationship of collaborating with GenAI and algorithmic appreciation. This trait refers to a personal preference for an

ordered and systematic working style and is positively associated with employee performance in working scenarios with traditional technology (Barrick et al. 1993). Barnett et al. (2015) integrated personality traits within the UTAUT framework and found conscientiousness to be positively associated with actual use of technology. However, Tang et al. (2022) contend that the arrival of AI-based tools gives reason to question the link. Given the unique characteristics of AI tools like (semi)autonomous decision making and lacking transparency of the underlying decision processes, the authors find that highly conscientious employees are less likely to benefit from working with AI technology. Based on complementarity theory they attribute this to the tendency of orderly employees to understand and structure the entire workflow in detail, resulting in a mismatch with an AI tool´s characteristics (Tang et al. 2022). Based on theory and the new phenomenon of GenAI being different from traditional technologies, we follow this argumentation. We posit that employees with a lower level of conscientiousness are more amenable to the provided suggestions and thus more likely to make less changes to the provided draft.

Hypothesis 2: A lower level of conscientiousness strengthens the negative relationship between collaboration type and changes to the provided draft text such that at a low level of conscientiousness there are fewer changes to the provided draft text when collaborating with a GenAI.



Design of Experimental Study

We created a between-subjects online experiment to examine how the source of the provided draft text affects the acceptance. The objective was to determine whether framing alone—that the proposal comes from an AI-enabled chatbot rather than a colleague—would affect how many adjustments participants made. Participants were presented with an easy-to-understand workplace scenario: They should imagine to be part of a small e-commerce start-up selling outdoor and adventure equipment online. Their supervisor gives them the task to write a short and creative advertising text for a brand-new product to be posted on the company's social media channels. The post needs to highlight key features of the new product like "durability" and "highest quality" and should be "very creative and catchy" for a potential buyer. A short survey preceded the experiment to measure the personality traits of the participants.

Participants were randomly assigned to either the *GenAI* or the *Colleague* treatment of the experiment. In both conditions they received the same text as a draft for the final marketing post. However, the source of the draft differed between the treatments: The *GenAI* treatment describes the use of "an AI-assisted chatbot" from which the participant received the draft. In the *Colleague* treatment a colleague at their fictitious workplace provided the draft. In both settings participants were then asked to review and adapt the draft within a maximum timeframe of 4 minutes and to make sure that it captures all the requirements of their supervisor. Finally, we include post-experiment manipulation checks to validate the attention of the participants. To provide as much realism as possible to the experiment, the provided draft text was in fact generated with the help of ChatGPT taking the task description as input prompt.

Measurement of Variables

We follow Tang et al. (2022) and measure conscientiousness via the two subdimensions industriousness and orderliness using items from DeYoung et al. (2007). Items for example include "I get things done quickly" and "I want everything to be just right" capturing both tendencies towards working efficiently and detail oriented. All items are measured on a 7-point Likert-type scale ranging from "Strongly disagree" to "Strongly agree". We use the text difference (i.e., the number of edits) between suggestion and submitted text as an appropriate outcome-oriented measure to assess the degree of trust that the participants put into the AI-based initial suggestion of a creative text. For a systematic evaluation of differences between suggested draft and submitted text we leveraged an adjusted version of popular diff algorithm by Hunt and McIlroy (1976) to compare both texts on a word per word basis. All submitted texts have been stripped of any formatting, punctuation, and transformed to lower-case before comparison to dismiss any minor changes. The algorithm marks any adjustments by the participant by enclosing it with " $\{+ ... +\}$ "-brackets in case of an added text snippet or with "[- ... -]"-brackets in case the participant deleted words from the suggestion. This enables us to extract both the numbers of individual additions and deletions to the draft as well as the number of added and deleted words. For instance, changing the sentence from "our brandnew rugged and reliable cooling box" to "our brand-new [- rugged and -] reliable cooling box [+ of the highest quality +]" is evaluated as one deletion, one addition, two deleted words, and four added words. Based on these four attributes we build a second-order construct named "Text Difference" comprised of the Likert-transformed sub-items classifying the submitted text on a 7-point scale ranging from "very few changes" to "very different".

Participants

For the online experiment we recruited 244 participants residing in the US through the platform Prolific. In comparison to other established platforms for online experiments like Amazon's Mechanical Turk, Prolific is tailored to the needs of researchers and according to prior studies participants are more diverse and attentive (Peer et al. 2017). We excluded participants with an approval rate of less than 95% for their previous participation in Prolific studies. Following established practice for online experiments in IS research, we implemented multiple attention and manipulation checks throughout the experiment leading to the removal of 25 participants from the sample. 8 participants failed attention checks within the survey section (like "Select 'strongly agree' for this question"), 17 participants failed the manipulation and realism checks (like remembering that the draft was provided by an AI-assisted chatbot). The final sample includes 219 observations with 111 observations in the *GenAI* treatment and 108 observations in the *Colleague* treatment. 105 participants identified themselves as female and 108 as male, while 6 preferred not to say. The average age was 42 years with an average work experience of 13 years. 7 participants did not have received a degree, 83 had a Highschool degree, 83 achieved a Bachelor's degree, 39 a Master's degree, and 7 participants received an advanced professional degree.

Results Analysis

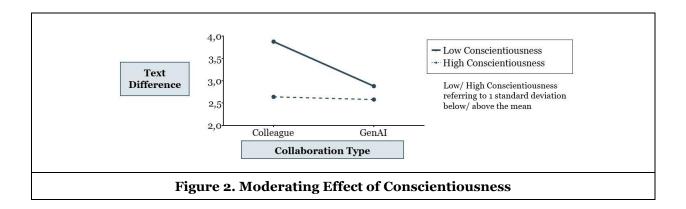
We examine the internal reliability of our measures. All constructs meet the requirements of a Cronbach's alpha above 0.7 (Industriousness = 0.9, Orderliness = 0.89, Conscientiousness = 0.92, Text difference = 0.86) indicating the reliability of all constructs (Urbach and Ahlemann 2010). We conduct a one-way analysis of variance (ANOVA) to determine whether the *GenAI* and *Colleague* treatments differ significantly by the number of edits performed by the user. We observe a statistically significant difference between the two treatments (F(1, 171) = 4.62, p = 0.033) with a lower text difference in the *GenAI* treatment (M = 2.71, SD = 1.58) than in the *Colleague* treatment (M = 3.27, SD = 1.81). This supports Hypothesis 1 where we posit that collaboration with a GenAI relates to fewer changes of the given draft text.

We use an OLS regression model to analyze the moderating effect of conscientiousness. We examine our model for possible multicollinearity issues before the regression analysis (Kalnins 2018) and control for variance inflation factors. The findings show that multicollinearity is not likely to be an issue (Kalnins 2018).

Table 1 shows the hierarchical regression model. Model 1 only contains our control variables. Following UTAUT (Venkatesh et al. 2003), we control for age, gender, work experience, and educational background of the participants. Model 2 introduces the type of treatment as either (0) *Colleague* or (1) *GenAI* as

predictor. Model 3 adds conscientiousness and Model 4 represents the full model including the interaction effects. Here we find further support for Hypothesis 1 (β = -3.055; *p* = 0.031). In addition, we also find a tendency to significance for Hypothesis 2 (β = 0.517; *p* = 0.069). The positive coefficient indicates that a lower level of conscientiousness strengthens the negative relationship between receiving a suggestion from a GenAI powered chatbot and making less changes in the submitted text. The marginal effects (*p* < 0.01) on this relationship are plotted in Figure 2. This further illustrates that for a high level of conscientiousness its impact on text difference. In contrast, participants with a low level of conscientiousness show considerable algorithmic appreciation for the suggestion provided by the AI-assisted chatbot by making fewer changes.

(DV) Text Difference	Model 1	Model 2	Model 3	Model 4
Controls				
Age	-0.0081	-0.00826	-0.00766	-0.00834
Gender	-0.109	-0.128	-0.0417	-0.053
Work Experience	0.00697	0.0047	0.00778	0.00809
Educational Background	-0.117	-0.129	-0.119	-0.0971
Independent Variables				
Treatment (0 = Colleague, 1 = GenAI)		-0.560*	-0.525*	-3.055*
Conscientiousness			-0.393**	-0.68**
Treatment x Conscientiousness				0.517^{+}
Constant	3.853***	4.259***	5.933***	7.286***
R2	0.01	0.037	0.08	0.099
Adjusted R2	-0.014	0.008	0.046	0.06
F	0.432	1.26	2.363	2.532
Note: *** p<0.001, ** p<0.01, * p<0.05, † p < 0.1. N=170 across all models				
Table 1. Hierarchical regression model on text difference				



Contribution and Outlook

We contribute with this study to IS research on algorithmic appreciation (Logg et al. 2019) in the novel context of human collaboration with a GenAI. Prior literature on human-AI collaboration in creative tasks is scarce and has focused on team dynamics or standardized association tasks (Bogert et al. 2022; Siemon et al. 2022). We complement these findings by investigating a novel application of GenAI for creative text

writing and examine what kind of human collaborators will accept algorithmic creative input (Seeber et al. 2020).

First, we reveal in an experimental investigation that the number of adjustments participants make does decrease when a text suggestion is defined as coming from an AI-enabled chatbot. We attribute the lower number of edits performed in the GenAI treatment toward a general appreciation for the capabilities of algorithms for creative text writing.

Second, we find a tendency towards significance for the moderating impact of conscientiousness on this relationship, hereby expanding the knowledge about the role of personality traits on the acceptance towards GenAI-provided outputs (Blut et al. 2022; Venkatesh 2022). Participants with low conscientiousness show a tendency to accept the suggestion from a GenAI-tool with fewer changes than the suggestion from a colleague. This adds to the findings of Tang et al. (2022) and supports their conclusion that highly conscientious employees are less likely to benefit from working with AI tools. We assume that individuals with a high level of conscientiousness tend to modify any text suggestion, regardless of its source, to match the task descriptions. In a workplace context, this might indicate that they may not realize the expected efficiency gains from collaborating with GenAI.

Third, we further extend existing theories, TAM and UTAUT, by explaining the role of GenAI as a digital phenomenon that changes our knowledge of well-established concepts. So far, existing theories center on the user of technology as actor (Davis et al. 1989; Venkatesh et al. 2003). However, GenAI provides a new context that requires theoretical adaptations (Baiyere et al. 2023): Due to the agential shift, GenAI is regarded as nonhuman agent collaborating with human agents in an organizational context. Such collaboration enables the emergence of generative digital products that are highly evolving (Yoo 2013) and have the potential to change an organization's value proposition, thereby imposing changes on the micro work practices of employees alike (Wessel et al. 2021). With our study we contribute to the need for fresh empirical contextualization of the theory (see Alvesson and Kärreman 2007) by exploring the acceptance of GenAI technology and the moderating impact of personality traits. Future research is needed to further explore how GenAI changes the long-standing assumptions and models related to TAM and UTAUT.

From a managerial perspective, the findings of our study are relevant when designing collaboration roles in an organizational context. Understanding the factors that influence GenAI adoption allows for future design proposals for human-AI collaboration in organizations (Seeber et al. 2020). For example, there may be certain tasks, such as addressing customer service requests, where a higher appreciation (i.e., a faster acceptance with less changes) of the GenAI-generated response by the employee is expected to obtain efficiency improvements. In this type of collaborative environment, the human job is limited to providing oversight to the output generated by the GenAI. In another setting, the employee may merely utilize outputs from GenAI to quickly create one or more ideas that excite the imagination and assist the employee in developing a more creative response by himself/herself.

Practitioners, like managers and software engineers, need to be able to address the potential advantages and disadvantages of teaming up with a GenAI and take the compensatory and/or preventative steps proactively. Based on our findings this considers in particular the unique characteristics of both the user and the task. While writing a creative advertising post is a simple example, there are numerous other scenarios in which accepting an AI-generated suggestion without extensive review is undesirable (e.g., situations that require fact-checking).

This study is subject to limitations. While we have specifically chosen an easy-to-understand scenario, the experimental study approach restricts external validity and reduces the generalizability of our findings, because imaginary circumstances are only analogs of real-world situations. Due to the novelty of our research, we believe however that experimental control is the best method for evaluating effects. In addition, we purposefully limited the perspective of this study to the acceptance and use of a GenAI-Tool. Further research could evaluate whether the texts provided by the users also differ in their creative quality. This would help to provide more insights whether GenAI could be leveraged to improve creativity of their users. In the full paper, we further elaborate on our methodology and the robustness of our results. Finally, we plan to broaden the theoretical foundation, in particular on the effect of individual personality traits to the use and acceptance of new AI-enabled technology. In doing so, we intend to expand on positive and negatives outcomes of employing GenAI not just for the individuals but also for organizations and societies.

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