Generative Artificial Intelligence as Creative Artificial Intelligence

Markus Appel [a], **Tanja V. Messingschlager** [a], **Gavin Raffloer** [b], **Perry A. Reed** [c]

[a] University of Würzburg, Germany

[b] University at Buffalo, USA

[c] Fielding Graduate University, USA

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Artists and media professionals have used digital technologies and software for decades. Recent progress in artificial intelligence (AI) has fueled a vivid discussion about the future of the arts, media, and entertainment sectors, and life with AI more generally. We define Creative AI here as *software that is based on AI computational methods (e.g., machine learning) and that is used with the goal to generate novel and useful information, including text, visuals, and sound.* In that sense, Creative AI belongs to the larger field of Generative AI which purpose may or may not be to generate novel (and useful) information.

In this chapter, we will focus on two fields with a particular relevance to media psychology: narratives and visual art. Since OpenAI made available their software ChatGPT in late November 2022, users worldwide have increasingly used AI chatbots to produce all kinds of texts, including fictional stories – previously a domain for human authors, poets, and scriptwriters. In the field of visual art, public interest in creative AI grew substantially after many media outlets reported about *Théâtre D'opéra Spatial* (e.g., Gault, 2022; Harwell, 2022; Roose, 2022; Vincent, 2022). This AI-generated visual artwork was awarded first place in the digital arts category at the Colorado State Fair in September 2022, entered into the competition under the name "Jason M. Allen via Midjourney" (Roose, 2022). *Midjourney* is an AI software, like *DALL-E* or *Stable Diffusion*, specialized in the creation of visual art.

In recent years, creative AI has been a topic in many disciplines, ranging from the arts and humanities to computer science. With the increasing use of AI in many fields of work and life, individuals and societies are faced with new challenges, such as potential changes in the production flow that could, among other fields, affect people in the creative and entertainment sectors (e.g., Tremayne-Pengelly, 2023). We believe that at this point it is too early to tell or predict how advanced AI will change job characteristics and careers. And we need to acknowledge that many questions that are connected to the proliferation of creative AI fall outside the scope of the chapter, mainly because they relate to other disciplines.

From the perspective of media psychology, *user responses* to artworks created by AI are of particular interest. In the following sections we will first provide a short introduction on the affordances and everyday use of AI software. Next, we will answer the question as to whether users can distinguish between AI-generated and human artworks. We will then introduce available theory and research on user responses to AI-generated (versus human-generated) stories and visual art. Reflecting an early focus in the academic field, source effects will receive particular attention.

A brief, non-technical introduction of creative AI software – and what people do with it

Creative AI tools can generate text-based literature including stories and poems. One popular tool is OpenAI's *ChatGPT*, which surpassed 100 million users within two months (Hu, 2023). Text-generating AI models such as ChatGPT are trained on large amounts of text data to learn the patterns, structures, and semantics of natural human language. During training, the model learns to predict the next word in a text sequence based on its statistical probability to occur, with the goal of keeping the sequence coherent (Radford et al., 2018). After training, the model can receive a user prompt (i.e., a brief instruction what to do), analyze it, and then generate a response word-by-word, sentence-by-sentence, line-by-line.

Many of these text-generating AI tools are accessed as conversational chat windows, mimicking the experience of sending instant messages to another human. The user simply enters a text prompt (e.g., "*write me a short story with lots of suspense*") and the AI tool begins generating text word-by-word. Because of the conversational nature, users can enter follow-up prompts based on the existing AI-generated text (e.g., "*make the ending more tragic*"). Users can improve their results by making prompts more specific and adding context (e.g., "*I like stories with mystical elements and set in the Victorian era*").

For fictional short stories, AI models have been trained to predict and generate story events based on earlier story events. These models learn from large data structures that provide knowledge of story settings, characters, and plot (Alhussain & Azmi, 2021). This

structural data allows the AI model to generate stories as a cause-and-effect sequence of events as characters act to achieve their goals. For poetry, AI models have been trained to generate poems that use figurative language and follow a specific rhyme scheme or meter (OpenAI, 2023). AI models can also employ semantic associations to build coherent themes throughout a poem.

Our second focus in this chapter is on creating visual images. With the help of machine learning and text descriptions of pictures, AI can learn to correctly identify objects in pictures. After being trained on huge amounts of pictures that show a certain object (e.g., a fruit basket), AI can associate certain shapes, colors and other characteristics with this object. For example, it can learn that a lemon and an apple are round but can tell them apart by their color. Building on these techniques, creative AI is now able to create pictures from text prompts. As it has associated objects with certain characteristics, it is able to use that knowledge to recreate a picture (Cetinic & She, 2022). Software such as DALL-E 2 or Midjourney enable users to create pictures by describing what it is they want portrayed in the picture and even specify details (e.g., the artistic style of the artwork). The results range from creating portraits or landscapes that look like photographs, to illustrating science fiction or fantasy scenery. Users can describe the image they have in mind precisely, or simply give the AI a short prompt of one or two words. While restrictive instructions are more likely to produce results that match what the user expects, short requests may often yield surprising results. This element of surprise can help artists in their creative process. As artists interact with creative AI, the generated pictures might spark new ideas, resulting in a new form of co-creation of artist and AI (Wingström et al., 2022).

Can people tell between AI-generated and human creations?

As the capabilities and contributions of generative AI are discussed, people inevitably run into the question of "well, wouldn't I be able to tell if something was made by a machine?" and the answer, resoundingly, is that it is much more difficult than it might seem.

While issues such as strange-looking or anatomically incorrect eyes and appendages may be clear evidence of generated images, AI art is at a point where participants can't tell if they have been looking at art from a generator or a human, as indicted by experimental data (Gangadharbatla, 2021; Samo & Highhouse, 2023).

Regarding AI-written narratives, Clark et al. (2021) found that the average person, even after undergoing training to detect AI, is unable to distinguish between AI-written and human-written narratives. People also struggle to identify haikus, poetry, and historical archives written by AI (Darda et al., 2023; Hitsuwari & Nomura, 2022; Köbis & Mossink, 2021). There are some clues to look out for, as indicated by detection software such as SCARECROW (Dou et al., 2022). The identified text areas flagged as being more likely written by an AI included "common sense errors", "math errors", "going off prompt", "encyclopedic knowledge errors", and "incoherent".

A related topic, often a crossroad between AI-generated visual and narrative, is that of deepfakes, i.e., moving pictures that appear to be video/film footage of real-life events, but are manipulated or created by software. Deepfakes are perhaps one of the biggest concerns regarding AI's role in disseminating misinformation. According to Appel and Prietzel's (2022) *deepfake detection model*, individuals can, in principle, identify deepfakes based on the deepfake indicators context (e.g., the deepfake is embedded in a journalistic article about it), technological glitches (imperfections such as poor lip synch), and content (content that runs counter to world knowledge, e.g., people say or do things they would never say or do). Studies show that individuals who are unfamiliar with the depicted content (e.g., strangers talking) cannot detect if a video is real or AI-generated, even when incentivized to be accurate (Groh et al., 2021; Köbis et al., 2021). However, implausible content of more familiar people (i.e., that of politicians) can elicit thoughts that a video might be manipulated – more strongly so among individuals who habitually engage in analytic thinking (Appel & Prietzel, 2022).

Recipient responses to AI-generated literature and art: Theoretical background

In media psychology and related disciplines, scholars attribute differences in recipient responses to a) content and form of the media product, b) individual differences (including developmental aspects that vary with age), c) situational variables (including source and paratext), and d) the interplay between these factors (e.g., Valkenburg & Peter, 2013). Thus, even if literature and art created by AI become indistinguishable in content and form from literature and art created by humans, other factors and related interactions (in a statistical sense) need to be considered. Of particular interest is the question whether the experience and evaluation of literature and art vary with its ascribed source.

Theory suggests that people are inclined to ascribe higher or even unique abilities to humans as compared to other species and, more importantly here, as compared to AI (*anthropocentrism*, e.g., Schmitt, 2020; Millet et al., 2023). Artistic creativity is a field which is strongly associated with being human (e.g., Chamberlain et al., 2018). Related research followed up on the distinction between agency (ability to think, to plan ahead) and experience (ability to have feelings, desires) in mind perception (Gray et al., 2007). Participants ascribed lower levels of agency to technology, like AI (Shank et al., 2021), or robots (Gray et al., 2007) with adult humans as the comparison group. Even stronger were the differences between technological entities and humans on the experience dimension. If anything, technology is considered to be suited for "thinking – not feeling – jobs" (Waytz & Norton, 2014, p. 434). Moreover, robots and AI are regularly perceived as eerie if they ostensibly show abilities that differ from these expectations (e.g., Appel et al., 2020; Gray & Wegner, 2012; Stein & Ohler, 2017).

Expectations, in turn, tend to affect the actual experience of artistic work. Fundamental processes of perception are prone to influences by expectations and related hypotheses (Bruner & Postman, 1949) and research on story processing showed that expectations derived from (positive vs. negative) critics' reviews of stories were found to

affect recipient experiences in terms of transportation / narrative engagement and related variables (Dixon et al., 2015; Shedlosky-Shoemaker et al., 2011; Tiede & Appel, 2020).

Recipient responses to AI-generated literature and art: Empirical evidence

Empirical research on the media effects of AI-generated literature is at its early stages. Messingschlager and Appel (2022) investigated how purported AI authorship influenced participants' cognitive-affective responses to short stories. The researchers operationalized participants' experiences as narrative transportation (Green & Brock, 2000), which is a mental melding of the reader's attention, emotion, and imagery faculties into the story world. Participants (falsely) informed of AI authorship were less transported into contemporary fiction short stories than participants informed of human authorship. As predicted, the finding did not hold for science fiction short stories that included machine characters, suggesting that participants perceived the science fiction stories a better match for AI's abilities than contemporary fiction. Notably, individual differences including affinity for technology and general attitude towards AI did not moderate the effect of purported AI authorship on a participant's level of transportation into the story.

Even if Messingschlager and Appel (2022) found consistent evidence with German and US samples, cultural differences might play a role in responses to AI-generated literature. Wu and colleagues (2020) investigated Chinese and American responses to actual AI-generated poetry. Chinese participants who were told that a poem was AI-authored, rather than human-authored, rated it as higher quality and more imaginative, empathized more with its poet, and deemed its poet as more competent. In contrast, American participants told that a poem was AI-authored, rather than human-authored, rated its poet as less competent. These findings for poetry evaluations reflect larger cultural differences at the time of the study; Chinese participants generally reported more positive attitudes towards AI than American participants (Wu et al., 2020).

Wu and colleagues (2020) argue that people's experiences with and evaluations of AI-created content is influenced by general attitudes towards AI. The findings of Messingschlager and Appel (2022) suggest a more nuanced consideration of people's preconceived notions of AI's abilities for creating specific literature, such as genre, rather than an overall general attitude. As creative AI tools become increasingly accessible and popular, additional research on responses to AI-generated literature is critical. A recent dissertation study (Reed, 2023) found that AI authorship awareness did not influence transportation or evaluations of story/author creativity for AI-generated contemporary fiction short stories. The latter results could indicate that attitudes and preconceptions of AI's abilities are malleable, and quickly shifting as creative AI tools become more accessible and receive extensive media coverage.

Turning to the effects of AI artist information on of the appreciation of visual art, the hypothesis of a negative bias against AI-generated art has been supported in some (but not all) available studies: If viewers are under the impression that a piece art has been generated by AI, they ascribe the artwork less artistic value (Gangadharbatla, 2021), they report lower perceived beauty, meaning, novelty, general liking, and lower perceived quality of the artwork (Ragot et al., 2020; Wu et al., 2020). Other studies, however, could not identify a bias against AI-generated art in terms of perceived value or quality, originality, imaginativeness, engagement, spatial presence, or composition of a painting (Hong & Curran, 2019; Xu et al., 2020). Israfilzade (2020) reports that AI artist information surprised art students and increased the perceived novelty, which is partially in contrast to the findings by Ragot and colleagues (2020) who worked with a more general sample. In two studies by Messingschlager and Appel (2023) AI artist information did not reduce the appreciation of a visual artwork, however, AI artist information reduced ascribed agency and experience and both components of mind perception were positively associated with appreciation. Thus, it appears that AI artist

information may elicit several processes, some leading to lower and others leading to higher appreciation.

The latter pattern of results points out the need to examine factors that influence how AI-generated art is experienced or evaluated. Following up on the potential differences between art students and the general public (Israfilzade, 2020; Ragot et al., 2020), interindividual differences could predict responses to AI generated art. Some research focused on art expertise as a predictor of appreciation, but results have been mixed. Gu and Li (2022) reported that art experts (vs. non-experts) liked paintings less, and had lower intentions to purchase and collect paintings if they were supposedly generated by AI. Chiarella et al., (2022), however, found no difference between art experts and non-experts in regarding the influence of artist information (AI versus human) on appreciation. Moreover, the effects of AI artist information could vary for different forms of art (e.g., representational art vs abstract art), because participants more likely associate AI-creations with styles that resemble abstract art (Chiarella et al., 2022; Gangadharbatla, 2021).

The Present and Future of Creative AI

The technological landscape around AI and Creative AI specifically, is changing at a rapid pace. Extant theory and research suggest that humans are in most cases unable to tell between literature and visual art that is generated by AI from those created by humans (e.g., Clark et al., 2021; Gangadharbatla, 2021; Samo & Highhouse, 2023). At the same time, humans tend to value and appreciate a creative product more when they are informed that it was made by a human rather than a machine (e.g., Messingschlager & Appel, 2022; Ragot et al., 2020; Wu et al., 2020). Importantly, such main effects have been qualified by genre (e.g., Messingschlager & Appel, 2022) or sample characteristics, such as cultural background (e.g., Wu et al., 2020; Xu et al., 2020).

For the near future, we expect that media psychologists further illuminate the intriguing interplay of the artwork, its source, and relevant third-variable influences on user responses. Importantly, insights on responses to AI need to comprise potential changes over time, as AI and the conversations around the assumed progress in the field of AI are developing fast. One of these emerging fields could be the interaction with and the effects of embodied artificial storytellers (e.g., storytelling robots) which may tell stories created by AI or by humans (see, for example, Appel et al., 2021; Liang & Hwang, 2023). Another promising field is the role that fictional media – most notably science fiction – have for Creative AI developers as well as users in terms of their goals, motivations, and attitudes (e.g., Appel et al., 2016; Mara & Appel, 2015). Works of fiction, such as the short story *The Sandman* by ETA Hofmann, Samuel Butler's 1872 novel *Erewhon*, Kubrick's 1968 movie *2001-A Space Odyssey*, or the 1920 play *R.U.R.* (*Rossumovi Univerzální Roboti*) by Capek (that introduced the word "robot" to the English language) preceded or accompanied the development of AI. Several additional questions are currently discussed in the general public that could inspire media psychologists, including: What are the effects of creative AI on professional artists (rather than recipients) and on everyone who produces art as a leisure activity (Lyu et al., 2022; Wingström et al., 2022)? What are the most effective ways to interact with creative AI software in terms of effective prompts and interactions (Liu & Chilton, 2022)?

Finally, we note that the distinction between AI-generated and human-generated stories and art, emphasized in everyday discussions and by many study designs we reviewed in this chapter, fails to represent how creative AI software is often used and how it will likely be used in the near future: The solutions produced by AI-software will be curated and modified by humans, making AI-software a sophisticated tool to express human imagination and creativity.

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