

Generative Artificial Intelligence Users Beware: Ethical Concerns of ChatGPT Use in Publishing Research

Samuel W. Logan

College of Health, Oregon State University, Corvallis, OR, USA

The purpose of this Letter to the Editor is to raise awareness to the readership of the *Journal of Motor Learning and Development* about ethical concerns related to generative large language models (LLMs) using Chat Generative Pretrained Transformer (more commonly known as ChatGPT) as a case example (OpenAI, 2023). Although there are a several LLMs available (Google Gemini and Nvidia ChatRTX), it is beyond the scope of this letter to review the ethical practices of each LLM. Instead, ChatGPT will be used to highlight the ethical concerns that may apply to any given LLM based on the underlying nature of how they were built. Generative LLMs are one type of artificial intelligence (AI).

AI is a broad field that includes the use of computer science, machine/deep learning, and large data sets to solve complex problems. Two AI applications include predicting (i.e., predictive) or generating (i.e., generative) output. An example of predictive AI is the use of large data sets of health indicators and algorithm-based analytical tools to examine factors related to diabetes, understand patterns, and predict outcomes (Wadhwa & Babber, 2020). LLMs are a form of generative AI. LLMs use large amounts of text data to recognize the underlying patterns and relationships of language. In turn, LLMs use this information to generate new text based on an entered prompt. At its core, LLMs generate output based on probabilistic models. One application of generative LLMs includes automatic speech recognition that converts audio to text and may be an option of transcription and captioning service to people who are deaf and hard of hearing. There are benefits to generative LLM applications that do not raise the same ethical concerns as using LLMs to generate content related to publishing research.

ChatGPT is the most popular generative LLM and gained over 100 million users within the first 2 months after its launch (Hu, 2023). ChatGPT users enter prompts and receive replies in a text-based, conversational back-and-forth nature. ChatGPT can produce short reports and summarize text (Walters & Wilder, 2023). The ethical concerns that will be discussed include environmental impact, exploitive labor practices, bias, plagiarism, authorship, and reference accuracy.

Address author correspondence to sam.logan@oregonstate.edu,  <https://orcid.org/0000-0001-8153-0967>

Environmental Impact and Exploitive Labor Practices

There are serious environmental impacts such as energy and water consumption associated with generative AI, including ChatGPT. For example, Microsoft disclosed a 34% increase in its global water consumption from 2021 to 2022 (O'Brien & Fingerhut, 2023). Microsoft partnered with OpenAI to support the development of ChatGPT (O'Brien & Fingerhut, 2023), and the increased water consumption is attributed, at least in part, to its work with generative AI and the water necessary to cool power systems that generate heat used by power plants and computer hardware. An estimate specific to ChatGPT suggests that its daily power usage is almost equivalent to about 180,000 U.S. households (Gordon, 2024). Another estimate is that one ChatGPT conversation uses about 16 ounces (i.e., 50 centiliters) of water (Gordon, 2024). The energy requirements to train ChatGPT's model and its continual use from users entering prompts contribute to its carbon emissions, but exact estimates are hard to come by (Wolverton, 2024). One estimate suggests that it takes the amount of power to light up five average light emitting diode lightbulbs for 60 min per 1,000 ChatGPT prompts. This may add up to substantial environmental impact based on the number of active ChatGPT users, but more research is needed to better understand the issue (Wolverton, 2024). Furthermore, investigative reporting found that OpenAI paid Kenyan laborers <\$2 an hour to filter out harmful text and images from ChatGPT results to make it less toxic, often to the detriment of the laborers' mental health from viewing explicit and harmful material (Perrigo, 2023).

Bias

ChatGPT output can be biased against underrepresented groups (Chavanayarn, 2023; Gross, 2023; Salinas et al., 2023). ChatGPT output is algorithmically generated and may reflect biases present in the text data it was trained on, which is largely from sources across the internet which tends to reflect and "encode" the biases and stereotypes of society (Bender et al., 2021; Teubner et al., 2023). There are no checks and balances in place to filter its output against bias or any other type of inaccuracies. Users may not question these falsehoods when they support existing beliefs (Chavanayarn, 2023). An empirical study involved asking ChatGPT to suggest jobs for different demographic groups and uncovered nationality and gender biases toward stereotypical occupations such as low-wage jobs for Mexican Americans, secretarial jobs for women, and engineering jobs for men (Salinas et al., 2023). Concerns about bias and AI, including LLMs and ChatGPT, are not new. Women of color in the AI industry have raised ethical concerns for years about ChatGPT and related AI tools (O'Neil, 2023).

Plagiarism

A plagiarism issue with ChatGPT is how it accessed the text data it used for training its model. ChatGPT accesses most of the internet and therefore has billions of data sources (Lund et al., 2023), although it is limited to an older version of the internet

from September 2021 and cannot access scientific articles behind a paywall (Hicks, 2023). Although most information on the internet is publicly available, this does not imply that everyone has consented OpenAI to use their content and create ChatGPT. There are a host of ongoing lawsuits for copyright infringement against OpenAI including from the *New York Times* (Grynbaum & Mac, 2023) and several fiction authors (Katersky, 2023).

The *American Psychological Association* (APA) defines plagiarism as the “... act of presenting the words, ideas, or images of another as your own; it denies authors or creators of content the credit they are due. Whether deliberate or unintentional, plagiarism violates ethical standards in scholarship” (APA, n.d.). I will highlight two uses of ChatGPT to discuss plagiarism, including content generation and content revision. Content generation involves providing a prompt to ChatGPT to create new text. For example, a ChatGPT user could enter the prompt “What is the relationship between fundamental motor skills and physical activity?” copy and paste the generated text into a manuscript, and revise as the author deems fit. My perspective is that content generation is clearly plagiarism because it is impossible to give appropriate credit to the sources of input ChatGPT used to generate text from a given prompt. In contrast, content revision involves providing a fully formed paragraph about fundamental motor skills and physical activity into ChatGPT and using it as a tool to revise the writing style. My perspective is that content revision is still plagiarism because of how ChatGPT was built with data sources where individuals did not provide their consent to its use.

Authorship

There is general agreement that ChatGPT should not be listed as a co-author on a scholarly work (Ide et al., 2023). This position is supported by many, including the APA (APA, n.d.), *Science* (Science, n.d.), *Nature* (Nature Portfolio, n.d.), and the *International Committee of Medical Journal Editors* (ICMJE, n.d.). ChatGPT cannot meet all criteria for authorship such as accepting responsibility for the “... accuracy, integrity, and originality of the work” (ICMJE, n.d.). Others question ChatGPT as a co-author because equating researchers to a machine is viewed as a loss of dignity to humans (Scimeca & Bonfiglio, 2023). The authorship issue is closely related to the plagiarism issue because in both cases, it is impossible to give appropriate credit to others who contributed to the generated or revised content.

Reference Accuracy

Reference accuracy refers to the correctness and completeness of all citation components such as author names, article title, journal name, and volume/issue/page numbers (Logan et al., 2023). Reference accuracy is important for many reasons (Logan et al., 2023), such as crediting others (George & Robbins, 1994; Hinchcliff et al., 1993; Oermann et al., 2001; Taylor, 1998). Citing others for their intellectual contribution is fundamental to scholarly inquiry and provides a historical record for the development of ideas over time (Hinchcliff et al., 1993; White, 1987).

ChatGPT is ineffective at reference accuracy and regularly generates incomplete, incorrect, or altogether fictitious references (Athaluri et al., 2023; Day, 2023;

Walters & Wilder, 2023). Admittedly, authors are not proficient at creating accurate references as a recent scoping review found that 32.7% of references contained at least one error (Logan et al., 2023).

More broadly, ChatGPT generates content that is not always factual (Gravel et al., 2023). Regardless of any improvements in ChatGPT's ability to accurately interpret or summarize text, researchers should understand that, ultimately, they are responsible for their own work and any output of ChatGPT should be verified for its accuracy.

My Personal Perspective

I have recently gained experience in creative writing within the horror genre and independent publishing scene, which offers a bold perspective on generative AI. *Tenebrous Press* published a magazine titled, *Thank You for Joining the Algorithm* in an act of anti-AI resistance and proceeds are donated to fight for artists' rights. The *Letter from the Editor* opens with a position on ChatGPT with clarity:

We're under attack. AI is threatening the livelihoods of writers, artists, and creative workers of all kinds. Generative AI programs such as ChatGPT and DALL-E are a pale imitation of the AI that classic Science Fiction stories warned us about, but their irresponsible development and exploitive use remain a cause for concern

(Howard, 2023, p. 1). This example in creative writing highlights a position against ChatGPT that contradicts the more accepting position within scientific writing, where its use is often allowed as long as it is disclosed. I make this connection because it is important for *Journal of Motor Learning and Development* readers to be aware that not all industries are readily accepting of ChatGPT use. Beyond creative writers, while it may not be as immediate of a threat, the role of science writers in the media and scholarly authors may be reduced with the widespread adoption of ChatGPT. In this case, science communicators may play an even greater role in understanding whether available scientific information is evidence-based or whether it is incorrect (often referred to as hallucinations) or misleading information generated by ChatGPT.

Independent presses such as Tenebrous Press, Ghoulish Books, Cosmic Horror Monthly, Seize the Press, and Cursed Morsels Press, among many others, explicitly state their zero-tolerance policy of considering submissions that used generative AI in content creation of fiction or artwork. In fact, any known use of generative AI as a creative writer or artist will ruin your reputation in the eyes of many and some Editor-in-Chiefs will ban you from submitting your work to their press in the future (Booth, n.d.). Many creatives refuse to submit to presses that allow authors or artists to use generative AI such as ChatGPT because they do not want to be associated with a publisher who embraces idea theft as an approach to creative writing or illustration. ChatGPT generates content based on others' work. Many creatives consider it stealing to use ChatGPT to come up with ideas, generate content, revise writing, and then put your own name on it when most of the effort was not your own work.

A scientific journal's policy about generative AI use will be a factor in my own decision making about where to submit our research manuscripts for consideration of publication. Furthermore, I may choose not to cite articles from journals or authors who use generative AI in their work. My own decisions are informed by the ethical concerns outlined in this letter, in addition to a concern about trustworthiness. One of the main purposes of the peer-review process in publishing research is to provide some amount of trustworthiness of articles due to checks and balances from other experts in the field. ChatGPT use introduces an unknown data source that is not trustworthy, or at least not yet.

My perspective is that whether it is creative writing or scientific writing, ChatGPT or similar LLMs should not be used if they were trained on other people's work without their permission and no reasonable way exists to appropriately give them credit for their time, effort, and ideas. To be clear, this position is specifically about using ChatGPT or similar LLMs in content creation whether its manuscript or grant writing or developing educational lectures. AI and generative AI are broad fields, and it is important for each person to understand related ethical concerns with a given tool to make an informed choice about its use.

Final Thoughts

I am optimistic that many people are simply unaware of the ethical concerns with ChatGPT and related generative AI tools, and that a resistance will swell against its claimed inevitable use in the classroom and research, including scientific writing. The ethical concerns raised in this letter go beyond the *Journal of Motor Learning and Development*; however, as an Editorial Board member of the journal, I felt it is an important topic to raise with our readership. It is critical for individuals to make an informed choice about whether to use ChatGPT for research, teaching, conducting peer-reviews, or any other form of content creation. Generative AI tools have potential if they are built with ethical practices. I am not an expert on generative AI, and it is a complex topic that is likely to evolve at a fast pace. This letter is not comprehensive but aims to provide a critical perspective about generative AI to ignite conversations among colleagues. Readers are directed to the following resources to inform their potential use of ChatGPT (O'Neil, 2023; Schlagwein & Willcocks, 2023; Stahl & Eke, 2024). I would encourage continued diligence in understanding the ethical concerns with ChatGPT, other LLMs, and generative AI more broadly as the technologies continue to develop.

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