Issues in the Ethics of Using Generative AI

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***Abstract*—Reflections on the relationship between performance enhancing drugs and some forms of academic dishonesty are presented. Generative AI is analyzed as a cognitive infocommunications technology, a technology intended in part to enhance human cognitive capabilities. Research intending to develop and improve generative AI is argued to be ethically sound. The use of generative AI as an enhancement to human cognitive capabilities in direct competitive scenarios such as assessment in education settings and the indirect competition of knowledge production is found to be lacking in ethical merit. The purpose of this article is to stimulate debate by adopting and defending firm, if extreme, positions on the ethical questions at hand.**

I. Introduction

How might one best respond the question: What do Ben Johnson, Lance Armstrong, Hans Niemann, Martin Stone and Marc Hauser have in common?

Ben Johnson's 1988 Olympic gold medal for the 100-metre sprint was rescinded because of the use of performance enhancing drugs [1]. The cycling wins of Lance Armstrong between 1998 and 2012 were erased by the US Anti-Doping Agency [2]. Hans Niemann lost a 100 million dollar defamation and anti-trust case against chess.com, which published a report of online chess cheating by Niemann [3]. Plagiarism by Leuven philosopher Martin W. F. Stone was documented by [4] and led to retraction of articles (see Figure 1 for an example) even from archives. Tenured Harvard psychologist Marc Hauser was sanctioned by the U.S. Department of Health and Human Services for fabricating data [5]; ultimately, Hauser resigned [6]. Many other analogous examples are available.

One might argue that what these individuals have in common is being sanctioned for recourse to professional performance enhancement treatments (drugs, chess-engines, plagiarism, fabrication) that are generally deemed unethical. They are not universally deemed unethical – an athlete undergoing treatment for an ailment may require otherwise proscribed drugs; practicing against a chess-engine might not be a bad for those who lack access to human competitors; it has been argued [7] that it might be good for everyone when lawyers plagiarise each other's contract drafting; simulating data is an excellent way of understanding what effects of various categories would look like. Evidently illicit use depends on performance enhancement in some competitive setting, even if that setting is no more than license to academic ego inflation. Another quality these individuals have in common is the intertwining of their illicit behaviours and rise to positions at the top of their respective fields – (temporary) personal gain from the behaviour.

This paper addresses the role of generative AI and its exemplars such as ChatGPT in scholarly pursuits. Students on taught courses, whether undergraduate or postgraduate, are ultimately competing with each other, and in that setting, even if some defenses are possible, the claim that availing of generative AI in that context is harmful appears insurmountable. The case for knowledge-creating research is slightly less clear, but is argued here to have the difficulty of greater proximity to what has been referred to as *bypass plagiarism* [7] – borrowing ideas that someone else has had before but neglecting to note an intermediate source through which the ideas became known – than to mastery of computational and statistical methods of data mining and analytical inference. Using generative AI to construct generalizations that pass for knowledge, whether in student work or an established academic's research, involves presenting work that isn't one's own as one's own.

Competition is isolated here as a quality of a context sufficient to make appeal to performance enhancement ethically dubious. However, this is not a necessary quality, although the examples noted which lack direct competition have a link to competition. Use of generative AI by educators in evaluating student work is also problematic, as discussed below, because education seems best when educators lead by example, and it creates an intractable double standard for students to be prohibited from "saving time" by using generative AI to produce work to be assessed while educators avail of generative AI to assess student work. Students who witness their educators using generative AI will therefore have implicit encouragement to use generative AI themselves in competitive contexts.

Other works address ethics in AI (see [8] which does not consider generative AI), in a more open way than in the present article. That is, alternative approaches to ethical reasoning are considered with reference to possibilities created by distinct aspects of AI, but without adopting any definite positions. The contrasting approach of this article is to frame the discussion in relation to a particular position, one we defend. Advocating a definite answer to an ethical question is inherently provocative. Indeed, the intention here is to stimulate reasoned debate about the extent to which the position argued is agreed by others and the considerations that merit tempering the position.

The cognitive infocommunications research community, as discussed in the next section, is an optimal community

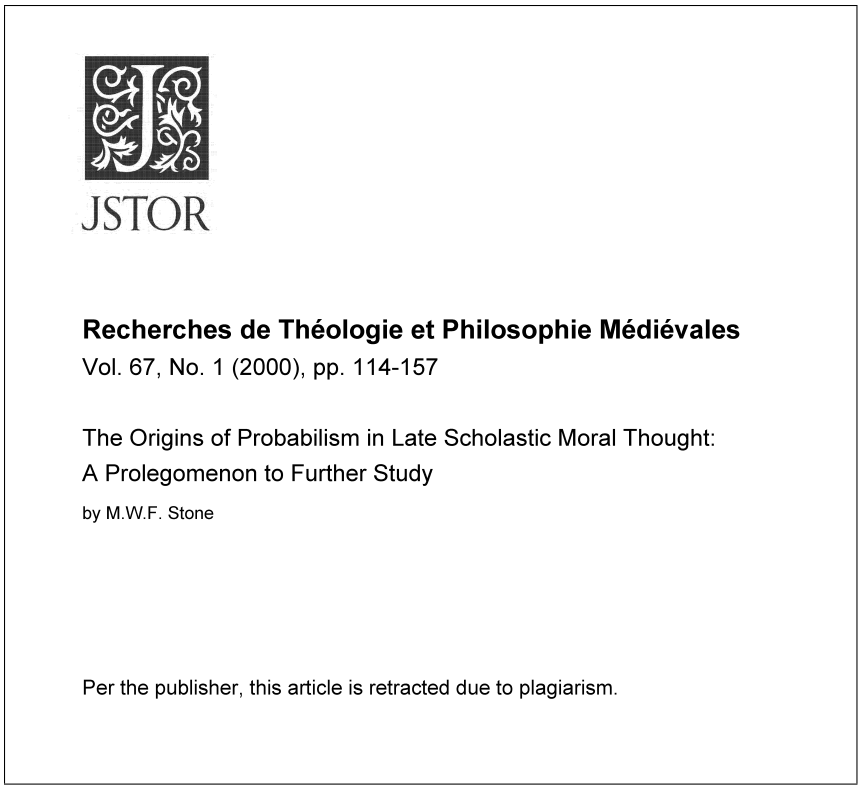

Fig. 1. An example of the permanent record of an article retraction – see https://www.jstor.org/stable/pdf/26170043.pdf – last verified July 2024

in which to engage in the surrounding debate, for the very reason that coginfocom is about enhancing human cognitive capabilities. This community of researchers is one that ought to be reflecting on when it is appropriate to utilize enhanced cognitive capabilities and when it is inappropriate. Other researchers in this field may agree with some, all, or none of the positions raised here. Nonetheless, it is important to identify the axes of variation and the reasons that give rise to those differences. This article provides a polemical starting point for the debate by articulating a coherent perspective against which others may react with agreement or disagreement.

Researchers in cognitive infocommunications have also advanced knowledge about pedagogical practice with reference to learning-enhancing technologies (for example, [9], [10], [11], [12], [13], [14], [15], [16]), and construing subject matter domains, such as mathematics, as examples of abstract technologies that enhance human cognitive capabilities (see [17], [18], [19], [20], [21]). Thus, the field has always attended to both the development of new technologies and the relevance for students of those technologies. As generative AI is a prime current example of knowledge-based performance enhancing technology, it is relevant for researchers in the field to scrutinize its practical and ethical dimensions, in general, and in the context of education.

The structure of the argument is simple: having contextualized it in this section, the next section presents a scientific discipline, *cognitive infocommunications*, for which the issues are pertinent; §III considers relevant scenarios; §IV explores the extent to which a choice of ethical frameworks matters significantly to reasoning about the problem; §V concludes: most uses of generative AI as a source of intellectual insight or guidance in scholarly writing are more like illicit doping than necessary therapeutic medication. Inspecting each individual observation and claim made here, one will probably find none to be novel, but hopefully all jointly coherent. As stated, the intent is to put forward a coherent ethical position on the use of generative AI in constructing knowledge and in educational contexts, and to let this position stand as one to which others may react for or against in its components or totality.

II. Cognitive infocommunications

Cognitive infocommunications [22], [23], [24], [25], [26] is a discipline that embraces the science and engineering of enhancing human cognitive capabilities. Spreadsheets, calculators and watches are examples of recent technologies that have been accepted by people as useful artifacts that make it possible for humans to think more advanced thoughts because these systems achieve something for them. Importantly, a person might not understand the details of the underlying implementation, but may trust that someone does, and that, modulo instrumentation error, the system will behave deterministically according to that detailed architecture.

Researchers in this field are among those who contribute to generative AI with work in robotics and dialogue systems, for example. The ethical questions associated with whether research in area should be pursued evidently are less vexed than research involving vivisection or human cloning, for example. More like research into pharmaceutical engineering or nuclear physics, most ethical questions address how the work might be used, rather than about concern for any sort of knowledge

to be advanced in this area. Generative AI as anchored in large language models and large data models retains three profound difficulties: a propensity to generate false claims ("hallucinate") as a natural process of the data modelling; a deficit in interpretability of judgements; an incapability to avert the output of generative AI from being adopted as input. Thus, it makes sense that research might proceed to address these tremendous challenges. Indeed, given the depth and breadth of visible interest in using generative AI, from the point of view of ethics, we think that there is an imperative that there be research which aims to eliminate the faults of generative AI. However, its being ethical to develop and improve generative AI does not entail that it is ethical to deploy generative AI in every circumstance. It is useful to consider generative AI, at least as it currently is available, in relation to other cognitive infocommunication technologies.

It has been argued [27] that a number of older technologies can be noted that also improve human cognitive capabilities: shoes, clothing, language, gesture. They distinguish *successful* cognitive infocommunication technologies as those innovations that become assimilated into the general concept of what it is to be human. Their general argument is that necessary conditions of such a successful technology include solving problems in both the public and private spheres of human existence (conscious thought is within the private sphere of existence, and language is particularly useful in thought, arguably more so than in communication, but language is still useful in the public sphere of communication). They address ethical issues of emerging technologies, also citing the relationship to performance enhancing drugs in athletics and noting the risk of yielding responsibility to cognition enhancing technologies and allowing underlying enhanced skills to waste away, but they tend towards supporting moderated access. Clothing, after all, is mostly useful.

With this framework in mind, one may ask the question of whether tools of generative AI are likely to be ultimately deemed successful as technologies of cognitive infocommunications. The analysis proceeds by posing the questions of whether the technology can be seen to lastingly solve problems in private and public domains of human existence. Evidently, an individual may use tools of generative AI as a personal entertainment – seeking suggestions of meals to prepare, works of fiction on a theme and in a special style, images of designated categories. Personal entertainment is not without ethical concern – generative AI is informed by data knowingly made visible to the general public and data that is unwittingly made available, and as a result it is possible to obtain entertainments that simulate the voice and image of humans, living and dead, engaged in productions without their knowledge, consent or fair payment. The claim that such productions are licensed by "fair use" doctrines in copyright law are an excellent example of the stretching of a legal allowance to the point of absurdity. One might also use generative AI systems to provide encapsulations of large bodies of text and knowledge, as a fast route to personal edification. These are private uses that can solve personal problems of entertainment, and to some extent, information summary. The problem of such systems in generating false "claims" limits their viability in guiding access to knowledge – the personalized summaries may contain errors of fact not contained in the summarized sources. In the public sphere, it has been seen that these systems have been used to serve propagandist purposes, and this undoubtedly solves a problem for those who require the communication of skewed and false information. However, it is not clear that this is a public good.

Given that generative AI models are informed, in part by the harvest of online and publicly visible content, the long term viability of such systems is suspect. In particular, as much of the content available to consume is at present the output of such systems, it may be anticipated that the the content they generate will diminish in quality over time, through repeated cycles of output serving as input. If this is so, the present may be a short window of time in which they appear to be useful. International Business Machines (IBM) did not always manufacture personal computers, and IBM no longer manufactures personal computers.

These observations suggest that generative AI may temporarily have moderate private value but is more limited in the public sphere, and therefore not likely to become as lastingly ubiquitous as clothing, its use part of the concept of the human condition. This position paper so far addresses popular use of generative AI, but one may also consider specific use cases, such as in education and research, and under the assumption that their quality is at present, and for some unknown duration, "good enough". Those are addressed next.

III. Cases

Two basic uses of generative AI for students are in items to be assessed towards a graded degree result and in research culminating in a research degree.

A. Assessments

It is not difficult to find instances of "essay markets" in which students provide their essays, preferably for the markets with the grades earned and feedback from assessors, to an organization which then sells them on to other students who require essays (assignments, projects, etc.) on the same topic. Similarly, "essay mills" exist in which people are paid to do deliver such work to order. One version of the use of generative AI is cognate with essay mills – the use to deliver wholes or parts of works to be submitted for assessments. Some might use these for an approach to problem specification, prior literature identification and synthesis, development of analytical tools, data analysis, and so on. In each of these cases, strong argument is available that use of the facility has as a cost decreased individual acumen of the user. Additionally, given that individuals being assessed are ultimately in competition with each other, the use of generative AI tools obscures the contributions of the individual to the end product and creates doubt about contribution of the individual to the process along the way. Thus, evaluating the submissions of individuals who use generative AI is at least as problematic as allowing athletes to compete while using performance enhancing drugs: on one hand it is unhealthy for them and on the other hand it is not clear what the athlete's contribution to a drug-enhanced win might be.

Consideration of student use of generative AI in work that contributes to assessments of their performance and finding that use to be ethically lacking invites symmetric reasoning about assessor use of generative AI in the evaluation of student

work. It is not the case that all relationships that associate with ethical proscriptions do so with symmetry, and therefore, the argument from symmetry, while a reasonable default, is not sufficient. For example, it is a responsibility of parents to provide nourishment to their infant offspring, but not a responsibility of infant offspring to provide nourishment to their parents. Further, in the case of a relationship that involves an asymmetry of power, such as a judge over other courtroom actors, the more powerful is typically thought to have a greater level of ethical accountability. If educators prohibit student use of generative AI but themselves deploy generative AI to assess students, they are justly accused of hypocrisy, not simply because the prohibition is symmetric, but partly because educators are in a more powerful position with respect to students and are thereby held to a more stringent standard, not least as potential role models. Moreover, using generative AI to assess students is tantamount to claiming that the generative AI assessment is at a higher standard and more reliable than assessment provided by human educators, because if it is not, the use of generative AI for assessment amounts to knowingly providing an inferior educational experience. On the other hand, if generative AI provides assessment at a higher standard than human assessors are able to supply, then the role of human educators requires more complete re-examination. Thus, a human educator appears to have no sound ethical basis to both be a human educator and avail of generative AI assessment of students.

Explicit knowledge creation, such as in the research that is intended to culminate in the award of a PhD might be different to use of generative AI for assessed work leading to graded qualifications. If human insights informed by data mining using machine learning may advance human knowledge, so too might the use of generative AI in the constructive research process. This is considered next.

B. Knowledge creation

Firstly, it is important to set aside the question of research into the construction and analysis generative AI systems – this is a body of knowledge in its own right and is no more dubious than pharmacology, rocket science or nuclear physics. The question is whether it is justifiable to use generative AI to advance knowledge about generative AI (or other topics) and whether it is appropriate for PhD students to do so in the context of their PhD projects and theses.

The PhD is a qualification that is awarded for educational achievement as well as for the knowledge created. The attainment part means that a student who has used generative AI to prepare tables, analyze data, synthesize literature, translate the final text, etc., cannot truthfully assert that the material of their PhD is their own work. Even if parts that are due to generative AI are attributed accordingly, then either these parts are critical to the work, or they are not critical, and if they are critical, then critical parts of the PhD are not due to the researcher, and if they are not critical, there is little justification for including them. The part of this question associated with the earning of a degree argues against the use of generative AI in the work. In particular, the graduates will be competing with other graduates for grants and jobs. Just as bribery even in industry works to the disservice of many (e.g. consumers tend to be faced with fewer high-quality choices), adding to the pool of researchers individuals who are not able to function well without generative AI does not contribute obvious strengths to the pool.

As established researchers who recruit post-doctoral researchers to positions on projects that we lead, at least one of the authors of this paper feels that if hiring a post-doctoral researcher, and faced with a choice between two otherwise equally qualified candidates, one whose PhD or peer reviewed publications were informed by generative AI (while not being *about* generative AI) and one who made no use of generative AI, the candidate who demonstrably functions well without generative AI would be selected.

This still leaves the question of advancing knowledge without a PhD attached. Major scholarly journals certainly ask authors to indicate the extent to which they have used generative AI. This is evidently reasonable during a window in time when the "hallucinations", the falsities put forward as truth, of generative AI are thought to be identifiable and the overall quality "good enough". The pursuit of opaque, uninterpretable classifications for the sake of high accuracy on some measure is arguably anti-intellectual, the opposite of the pursuit of knowledge. However, it could well be that, in the spirit of interpreting the output of data mining, some researcher might perceive the output of generative AI and note that it is unlike any knowledge personally encountered before. Accepted at face value, the researcher could hardly with any legitimacy publish a paper about it in a manner that claims authorship of the idea. The alternative is to test the hypothesis associated with the content in the manner one would test generalizations formed from data mining generally. In that case, the data mining approach is detailed clearly in the research methods section. In this form, one is hoping that one is analyzing a "hallucination" and not rediscovering a previously (perhaps, often) noted trend that is embedded in the data that formed the training of the generative AI system. That distinction is separate, and would be an arduous research question to resolve in any of its instances. It is an open question whether a researcher who needed generative AI to put forward the idea would be capable of testing whether the idea is a known truth, a new truth, or a falsehood.

These considerations suggest that the use of generative AI to perform research offers little obvious value.

IV. Principles

It is possible that the reasoning so far is biased according to the framework for ethical reasoning adopted. That possibility is now addressed, by examining a number of prominent frameworks for ethical analysis and considering within them questions of use of generative AI. We consider these frameworks in relation to our conception of ethics: utilitarian ethics with focus on maximizing good and minimizing harm; virtue ethics, with focus on decision maker values; normative reasoning, with focus on community consensus on what rules of behaviour are; information ethics, with focus on order, as opposed to chaos, without an inherent preference for humans over other sources of information in the universe.[1]

[1]We do not pretend to provide an encyclopædic view (in breadth or depth) of ethical frameworks, although distinctive conceptions are represented, but address each of the named frameworks to a limited extent with reference to the problems of generative AI: others might argue differently within each.

Utilitarian reasoning favours choosing a path that seeks to the greatest good for the largest number of people. It is easy to see that for an individual, there might be short-term utility in availing of generative AI, but the any such advantage does not appear to have strength in lasting beyond that short term. "Winning" the relevant competition may create new opportunities for that individual, but those which depend on having the ability mimicked through generative AI will come with continuing demand to perform accordingly. Reliance on the technology will weaken unaided ability. However, the individual cannot be assured of always having access to the technology – the electricity may falter; the network connection may be faulty; a prohibitive monetary cost on using the technology may be imposed. Thus, utility even to just the single user is limited. On a wider scale, the community gains little if those whose education the community subsidises (or even those whose education they do not subsidise) is merely the semblance of an education, rather the mastery of seeming to perform well through reliance on generative AI. Natural disasters happen. Humans cause disasters. The community requires people who are capable of independent reasoning even when there is no power for extended durations of time. Students and researchers who cannot function without generative AI are not themselves able to reliably contribute to the community *qua* students and researchers. Thus, utilitarian reasoning does not support the use of generative AI.

Virtue ethics suggests opting for choices that exemplify positive traits generally regarded as virtues, such as truthfulness and practical wisdom. Clearly, self-sufficiency is maintained by acting, whether in competition or the production of knowledge, without the direction of generative AI, as is recognition of personal responsibility. One might argue that truthfulness can be maintained by a person who declares their use of generative AI. This does not resolve the problem of the use of generative AI in directly competitive situations, such as the context of graded assessments, because it remains impossible to evaluate the competitor's individual contribution to the final product or to the process that leads to that final product. The sociology of science reveals that the production of knowledge also involves competition, inasmuch as researchers compete for research grants; first publication of ideas and results is deemed important; research evaluation typically includes cross-reference to the performance of direct competitors; and so on. Thus, declaration of use of generative AI in the production or presentation of research advances, while truthful, also creates problems for the fair evaluation of individual performance in the competitions that surround research. With respect to the production of new knowledge, if that can be seen to transcend the competitions inherent in that, the declaration of contribution of generative AI merely serves to emphasize that the "knowledge" is more putative than certain. Greater wisdom is evident in eschewing generative AI in these contexts than deploying generative AI. Thus, reasoning in relation to virtue does not support the use of generative AI by students or researchers.

Normative reasoning suggests adhering to a community's conventions, "rules". Educational contests typically make the rules for participation clear: competitions should be fair, and therefore the behaviour of both competitors and evaluators should be fair. This implies that competitors are evaluated on the strength of their individual contributions (which allows that a group may act together as an individual competitor, but nonetheless requires that each group member respect the rules) and that evaluation takes place according to the declared terms of the contest. The rules could be set in a manner that allows competitors to utilize external performance enhancements provided it is clear what processes and outcomes will determine the final rankings. A problem from the perspective of education and evaluating educational attainment is that such revised rules would be unfit for purpose. With respect to the creation of knowledge, the fact that scholarly journals seek declaration of the nature of generative AI inputs to the work reported suggests that conventions have been emerging that accept the use of generative AI in producing and reporting knowledge. Further, while there may be no fee for use of such systems (apart from the hidden costs of yielding personal data to the generative AI systems), there is little financial impediment to access by researchers. The cost of an electron microscope dictates more binding constraints on who may participate in research requiring them than the current cost of generative AI imposes. Thus, the "rules" associated with research conduct do not prohibit availing of generative AI, but they do not require it either. An additional rule embedded within the research community is that known caveats to generalizations put forward should be declared. Providing clear indications of which generalizations are susceptible to the failings of generative AI is urgent, additional to the general declaration of generative AI having been utilized. Even if rules and norms do not provide a current prohibition, it must be noted that norms and rules change: without contravening norms of the era, Plato is alleged to have been a slave-owner [28, III.39–pp. 310-311.].

Information ethics supports the minimisation of entropy, with characterisation of evil as increase in entropy [29]. A precise and definitive position as articulated by the main proponent of information ethics is not yet available, to our knowledge (see [30]). Inasmuch as increase in entropy corresponds to increase in possible outcomes, increase in uncertainty, our own reasoning according to this framework suggests that when competitors avail of generative AI to enhance the products of their labours, there is less certainty about the contribution of the humans meant to be assessed for those labours, such that the use of generative AI is not supported. Where generative AI is used in support of the increase of knowledge, again, the increase in uncertainty accompanying the identification of individual hallucinations argues against the value of generative AI according to these principles of information ethics.

Only according to normative reasoning do we find support for the use of generative AI through the lack of rules prohibiting it. However, conflicts of interest arising through funding sources are also meant to be declared; this does not entail that conflicts of interest are endorsed. Moreover, we noted that conventions and norms can reverse in their effect over time. Using none of these frameworks for ethical reasoning are we able to identify univocal support for the use of generative AI in work leading to educational assessments or the production of knowledge – the choice of an ethical framework appears not to significantly affect these conclusions.

V. Conclusion

We hope that the arguments against using generative AI in this manner as offered above are compelling to others. We

hope this because we hope that knowledge will increase and that future generations of scientists will not be have diminished capacity to create knowledge. It is perfectly consistent to be established contributors to the scientific literature in artificial intelligence and cognitive infocommunications, the latter a field specifically targeting the analysis of human cognitive capabilities and technologies that enhance human cognitive capabilities, and to argue against the application of generative AI in the production of scientific research or as part of students' educational formation.

We opted against an "ecumenical" stance here, thinking it better to adopt a firm position that we find defensible, if extreme. A polemical view is likely to trigger the reflection and debate on these topics that we think timely and necessary.

There was a time in AI research when one would present one's new approach to a problem and demonstrate its effectiveness according to accepted measures and then be met with the question, "but is it artificially intelligence?" In current times, it is reasonable to redirect the question to the basis of a final year degree result, a PhD thesis or a research finding put forward for publication. The question in former times was wishful; at present, it is regretful. In the meantime, many appear to have lost interest in the question of what, if anything, constitutes intelligence and are also happy to rely on systems they are fairly certain no one completely understands. This may entail its own socio-economic ecosystem of entertained occupation; however, some prefer the pursuit of truth and knowledge.

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