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## Textual imitations and artificial intelligence : a prospective essay on academic fraud

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# TEXTUAL IMITATIONS AND ARTIFICIAL INTELLIGENCE: A PROSPECTIVE ESSAY ON ACADEMIC FRAUD

*Ludovic Jeanne*

## 1. Introduction

Academic integrity, whether associated with research or teaching activities<sup>1</sup>, is closely linked to the fight against academic fraud.\* In this struggle, the balance and dynamics of resources and strategies play an important role. In particular, the ability of organizations and their

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<sup>1</sup> This research benefited from the insights and scientific skills of Mr Alexis Lechervy (Lecturer and researcher at GREYC – UMR CNRS 6072, University of Caen) and Mr Denis Escudier (Associate Director of MomentTech and Vice-President of Datalab Normandie).

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dedicated staff to detect fraud plays a critical role. This is because, from the perspective of the sociology of deviance (Becker, 1963), potential fraudsters' anticipation of the ease or difficulty with which they can be unmasked and socially sanctioned is one of the criteria of their "definition of the situation" and, therefore, of their behaviour. Moreover, this balance is not stable over time and the emergence of new technologies reminds us of this increasingly acutely. Since the production of research articles has become the criterion for valuing individuals and institutions, all the mechanisms put in place by research ethics committees are not sufficient to curb fraud, which becomes evident only at the very end of the production chain.

Thus, this chapter focuses on a particular aspect of our questioning of the current situation: the potential opportunities offered by artificial intelligence (AI) in terms of producing an "original" and meaningful text, but without (or almost without) any writing work by the declared author and, therefore, without the related construction of the author's thoughts.

Based on the case of an AI platform dedicated to the semi-automatic generation of "original" texts, this work aims to analyse the implications of these new tools from the point of view of both the potential fraudster and the organizations in the Higher Education, Research, and Innovation (HERI) sector, which strive to train students in integrity and take action against fraud.

Two main questions guide this prospective reflection: What are the potential consequences of the emergence of such technology for academic integrity? And does AI applied to the production of texts announce the disappearance of plagiarism in favour of the predominance of another type of fraud? It is also necessary to clarify the extent to which and under what circumstances the use of AI, in the form of a semi-automatic or automatic text generator, could be considered an academic fraud.

## **2. Producing “Original” but “Authorless” Texts: an Exploration of the Capabilities of the Speedwrite Platform**

An experimental approach appears appropriate to assess the potential effects both of new technologies and of new modes of research administration (the two are intertwined) on research integrity (Arnold, 2014; Cabanac & Labbé, 2021; Labbé, 2016). Therefore, we conducted an experiment on the Speedwrite platform. This mainly involved selecting a text and having it processed by the platform to produce a new “original” text. Choices were made according to the following methodological logic: isolate a textual production from a clearly identified author and produce an imitation of it under the best performance conditions announced by the designers of the tool while minimizing the necessary work for the “fraudster-experimenter”. Thus, the first choice was to choose a text in English: the Speedwrite platform was originally designed to operate in English or in languages that are rather close to it (e.g., Spanish and French). The creators warn about the underperformance of their tool for extremely dissimilar languages, such as Arabic and Mandarin.

The selected text focuses on one of the experimenter’s fields of expertise in order to facilitate adaptation and post-production improvements. The goal was to end up with an “original” final text that would be able to pass the test of a similarity detection platform while intervening as little as possible with the text produced by AI. The similarity detection platform that we used was Turnitin.

Our choice to retain only one text to transform using the Speedwrite platform aimed to optimally test the machine’s capabilities. Indeed, one of the platform’s “promises” is that the text produced cannot be identified as plagiarism using existing tools. For statistical reasons, increasing the number of input texts can only be a facilitating factor for the process of producing an original output text. The challenge appears much greater if there is only one input text. The platform itself explicitly encourages the

user to utilize multiple input texts.

We also retained a relatively short text so we could truly test the capabilities of the Speedwrite platform. Indeed, as indicated above, text generation mechanisms are fundamentally statistical (Labbé, 2016); the smaller the textual corpus, the greater the risk that the platform’s ability to reformulate without causing undesirable similarities will be challenged.

The selected text was first “cleaned up” by applying the rules presented in Table 1. Then, the resulting text—called the “cleaned test text”—was entered into the Speedwrite platform, paragraph by paragraph. Since the platform can only produce a new and original text from relatively short sequences of words, it almost always requests that the inputted paragraphs be divided (Document 1 and the following documents). Depending on the case and its size, the initial paragraph could be divided into two, three, or four. Then, a simple click to request a “prediction” and the platform produced a new “original” text from the original text as follows:

*Document 1. Step 1: Copy and paste the source text (left) and calibrate it*

| Too long. Shorten or split                                                                                                                                                                                                                                                                                                                        | Title: Untitled |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| The invitation to write progress reports on geography and ethics recognizes the significance of a new disciplinary interface. Indications of a “moral turn” are evident in various conference programmes and publications. It was first clearly signalled in the proceedings of a conference organized by the Social and Cultural Geography Study |                 |

Group of the Institute of British Geographers, the introduction to which called for an engagement with ethics or moral philosophy, involving “the articulation of the moral and the spatial” (Philo, 1991: 26). Then there was a session entitled “Rethinking metatheory: ethics, difference and universals” at the 1994 meeting of the Association of American Geographers, which generated a special issue of *Society and Space* (15(1), 1997) introduced by an essay on a normative turn in social theory (Sayer and Storper, 1997), along with articles linking social justice with broader considerations of the good life (Smith, 1997), rethinking geopolitical encounters (Slater, 1997), and exploring aspects of identity relevant to a relational ethics (Whatmore, 1997). There was a session on “A/moral geographies” at the 1995 IBG conference, and links between geography and ethics featured at the 1997 meetings of both the RGS (with IBG) and the AAG, with the promise of more to come in 1998.

**Split paragraph**

*Document 2. Step 2: Calibration done, launch the production of “predictions”*

| Ready to predict (F2 or Ctrl+Q).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Title: Untitled |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| The invitation to write progress reports on geography and ethics recognizes the significance of a new disciplinary interface. Indications of a “moral turn” are evident in various conference programmes and publications. It was first clearly signalled in the proceedings of a conference organized by the Social and Cultural Geography Study Group of the Institute of British Geographers, the introduction to which called for an engagement with ethics or moral philosophy, involving “the articulation of the moral and the spatial” (Philo, 1991: 26). |                 |
| <b>Predict</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |
| Then there was a session entitled “Rethinking metatheory: ethics, difference and universals” at the 1994 meeting of the Association of American Geographers, which generated a special issue of <i>Society and Space</i> (15(1), 1997) introduced by an essay on a normative turn in social theory (Sayer and Storper, 1997), along with articles linking                                                                                                                                                                                                         |                 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p>social justice with broader considerations of the good life (Smith, 1997), rethinking geopolitical encounters (Slater, 1997), and exploring aspects of identity relevant to a relational ethics (Whatmore, 1997).</p> <p>There was a session on “A/moral geographies” at the 1995 IBG conference, and links between geography and ethics featured at the 1997 meetings of both the RGS (with IBG) and the AAG, with the promise of more to come in 1998.</p> |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

*Document 3. Step 3: Imitated text (right)*

| Ready to predict (F2 or Ctrl+Q).                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Title: Untitled (6 unsaved)                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The invitation to write progress reports on geography and ethics recognizes the significance of a new disciplinary interface. Indications of a “moral turn” are evident in various conference programmes and publications. It was first clearly signalled in the proceedings of a conference organized by the Social and Cultural Geography Study Group of the Institute of British Geographers, the introduction to which called for an engagement with ethics or moral philosophy, involving</p> | <p>The invitation to submit progress reports on the development of ethics and geography recognizes the significance of the new disciplinary interface. In various publications and conferences, the signs of a moral turns have been presented.</p> <p>During the 1994 meeting of the American Geographers Association, a session entitled Rethinking metatheory was held. It brought together various articles</p> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “the articulation of the moral and the spatial” (Philo, 1991: 26).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | about the normative shift in social theory and how it relates to the good life. Among the articles was an essay by Sayer and Storper on the subject.                                                                                    |
| Then there was a session entitled “Rethinking metatheory: ethics, difference and universals” at the 1994 meeting of the Association of American Geographers, which generated a special issue of <i>Society and Space</i> (15(1), 1997) introduced by an essay on a normative turn in social theory (Sayer and Storper, 1997), along with articles linking social justice with broader considerations of the good life (Smith, 1997), rethinking geopolitical encounters (Slater, 1997), and exploring aspects of identity relevant to a relational ethics (Whatmore, 1997). | In 1995, a session on moral geographies was held at the IBG conference. In 1997, a similar discussion was held at the AAG and RGS meetings. The promise of more sessions on topics related to geography and ethics is expected in 1998. |
| There was a session on “A/moral geographies” at the 1995 IBG conference, and links between geography and ethics featured at the 1997 meetings of both the RGS (with IBG) and the AAG, with the promise of more to come in 1998.                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                         |
| <b>Predict</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                         |

The resulting text called “raw imitation” (no. 1) was then edited and adapted or clarified to bring it closer to a finalized text (“reworked imitation”, no. 2). Therefore, the initial analysis is based on four textual objects in English (Table 1).

**Table 1***The Methodological Device and the Initial Results<sup>2</sup>*

| Text         | Author         | Words | Charac- | Variation | Similarity | Remarks                                                                                                                                                                                                              |
|--------------|----------------|-------|---------|-----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                |       |         |           |            |                                                                                                                                                                                                                      |
| Original     | David M. Smith | 4,501 | 25,285  |           |            | Smith, D. M. (1997). Geography and ethics: A moral turn? <i>Progress in Human Geography</i> , 21(4), 583–590.<br><a href="https://doi.org/10.1191/030913297673492951">https://doi.org/10.1191/030913297673492951</a> |
| Cleaned Test | David M. Smith | 3,051 | 16,762  | –33.71%   |            | Removal of citations<br>Removal of chapter numbering<br>Removal of traces of the original author and publisher<br>Removal of acknowledgements<br>Removal of bibliography<br>Removal of header and footer mentions    |

<sup>2</sup> David M. Smith is a real author, Professor Emeritus of Geography at Queen Mary University of London. Donald Fake is a fictional author to whom we attribute, in this text, the use of the Speedwrite platform to produce the two texts called ‘Imitation’ no. 1 and no. 2.

|                                              |                            |         |                                                                                                                                                               |
|----------------------------------------------|----------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Raw Imitation EN (no. 1)<br>Donald Fake      | 2,174<br>11,259<br>–32.83% |         | Transfer to Speedwrite                                                                                                                                        |
| Reworked imitation EN (no. 2)<br>Donald Fake | 2,363<br>12,405            | 15<br>% | Editing, minimal reformulations (in Word track changes mode) with the help of DeepL by Donald Fake.<br><br>Reinstatement of a few bibliographical references. |

The reduction in the length of the text from one step to another is due to processing by the experimenter, on one hand, and to processing by the platform, on the other hand. Thus, the abridgement between the “original” text and the “cleaned test” text is mainly due to the deletions indicated in Table 1. However, the reductions in the text length between the “cleaned test” text and “imitation” texts no. 1 and no. 2 (respectively, –32.83% and –25.99%) are mainly due to the processing applied by the platform. In particular, the platform eliminated the numerous bibliographical references included in the body of the ‘original’ text and preserved in the previous stage.

Moreover, the selected text included several passages consisting of rather long lists: these passages were drastically condensed by the platform. This highlights an effect of the processing applied by the platform to produce the output text—it tends to be shorter than the textual material

used as input and this reduction does not affect different syntactic forms in the same way.

The production of the ‘reworked imitation’ text then clarified and structured the presentation of the text as follows:

Geoethics: geography and the turn of ethics

By Donald Fake, Department of Geography, Clark University, USA

The invitation to ~~participate in~~investigate the progress ~~reports on~~regarding ethics and geography recognizes the importance of a new disciplinary interface, which is evidenced in various conference programs, ~~research~~ and publications. In the introduction to a conference on the topic of ethics, ~~the group~~the author emphasized the importance of the spatial and moral articulation ~~as a new and critical objective for the community of geographers~~ (social, political and cultural geographies). To understand that turning point, it is necessary to put into perspective its history.

Recent history of the encounter between Ethics and Geography

In 1994, a session on metatheory was held at the AAG meeting. It generated a special issue of ~~Society and Space~~, which discussed various topics related to social theory and ethics. Among the topics discussed were the normative turn in social theory, geopolitical encounters, and the concept of relational ethics.

At the 1995 IBG conference, a session on moral geographies discussed the importance of spatial and moral articulation. In 1997, the RGS and the AAG also highlighted the link between geography and ethics.

*Document 4. Editing with additional corrections by Donald Fake (transcribed sample)*

This process also made it possible to eliminate “garbage” from the Speedwrite platform’s processing:

*Document 5. “Garbage removal” in the “Raw Imitation” text by Donald Fake (transcribed sample)*

It is also important to note that criticism of moral codes that explicitly condone human sacrifice and racism and torture can raise questions about the authority of the principles used to condemn these practices.

~~For the best predictions, start with at least five paragraphs. Then, add at least 100 words into this window.~~

In Billington's discussion [1993] of moral relativism, he uses the heading "Geographical perspective" to refer to the various ideas about how to behave. He also makes the point that one doesn't need to be an anthropologist to be aware of the various conflicting ideas about how to behave.

Furthermore, this phase also made it possible to reintegrate bibliographical references, to a limited extent, in order to produce a text that

appears relatively “natural”. Once this was done, the “reworked imitation” text was completed by giving it a title and an author name. The final result of this process was tested on the Turnitin platform. The test yielded a 15% similarity rating.

Thereafter, the “reworked imitation” (no. 2) text was tested with a English-speaking, bilingual human operator, who confirmed that the text appeared “natural”. The complete Turnitin report was then examined and the textual corpus tested from the interactive interface was examined. This revealed that, in this exploratory case—even though the resulting similarity rate was rather low—the Turnitin platform nevertheless connected the imitation text (no. 2) produced using the Speedwrite platform with its source, that is, the original text by David M. Smith.

Indeed, working with the interactive interface, it was possible to verify that source 1, given a 12% similarity rating, *was still related to the original text*. The second and third sources were related to other texts by the same author. However, the Turnitin report reveals that an authority in charge of investigating a suspicion of plagiarism would not have sufficient evidence to prove that Donald Fake had plagiarized. Indeed, the text tested was essentially rated as presented below:

*Document 6. Identification of similarity by Turnitin (transcribed sample)*

Recent history of the encounter between Ethics and Geography

In 1994, a session on metatheory was held at the AAG meeting. It <sup>1</sup>generated a special issue of *Society and Space*, which discussed various topics related to social theory and ethics. Among the topics discussed were the <sup>2</sup>normative turn in social theory, geopolitical encounters, and the concept of relational ethics. At the 1995 IBG conference, a session on moral geographies discussed the importance of spatial and moral articulation. In 1997, the RGS and the AAG also highlighted the link between geography and ethics. <sup>3</sup>The return of social justice to the geographical agenda was signaled by Harvey in 1992. This topic has been re-engaged in various ways, such as in articles on various substantive issues, such as health care and population migration in South Africa. Three new books have been released since 1994, with different...

On the other hand, there were entire paragraphs in which no similarities were detected. Therefore, it is possible to conclude that, despite the constraints imposed in this experiment, the Speedwrite platform was able to produce meaningful text, which appeared original and for which a verification authority would be unable to establish indisputable plagiarism. Yet, we know that Donald Fake wrote virtually nothing of the text we call the “imitation”. Indeed, a quick count reveals that Donald Fake wrote 122 words in the body of the text. His bibliography is 128 words long, which means that, according to the statistics in Table 1, Donald Fake actually wrote 5.45% of the final imitation text, which he also edited in its entirety so he could write these 122 words. Therefore, overall, the “commercial promise” of the Speedwrite platform is kept, particularly since, with just a little work, the generated text appears “natural” to the reader, unlike other tools that produce meaningless texts but enable the manipulation of scientific information systems (Cabanac & Labbé, 2021; Labbé, 2016).

A second phase of experimentation was conducted to test the cross-linguistic question. Donald Fake’s “Reworked imitation EN no. 2” text was inputted into the DeepL platform to be translated from English to French. The result, “Raw imitation FR no. 1”, was then reworked by Rackham Pirat, who had helped himself to Donald Fake’s text through translation. This yielded the “Reworked imitation FR no. 2” text (Table 2).

**Table 2**

*The Methodological Device and Additional Results<sup>3</sup>*

| Text         | Author         | Words | Charac-<br>ters | Variation | Similarity | Remarks                                                                                                                                                                                                              |
|--------------|----------------|-------|-----------------|-----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Original     | David M. Smith | 4,501 | 25,285          |           |            | Smith, D. M. (1997). “Geography and ethics: A moral turn?”, <i>Progress in Human Geography</i> , 21(4), 583–590. <a href="https://doi.org/10.1191/030913297673492951">https://doi.org/10.1191/030913297673492951</a> |
| Cleaned test | David M. Smith | 3,051 | 16,762          | –33.71%   |            | Removal of citations<br>Removal of chapter numbering<br>Removal of traces of the original author and publisher<br>Removal of acknowledgements<br>Removal of bibliography<br>Removal of header and footer mentions    |

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<sup>3</sup> Rackham Pirat is another fictional author to whom we attribute in this text the use of the DeepL platform to produce the two texts called ‘Imitation FR’ no. 1 and no. 2. Donald Fake is the author of the earlier texts ‘Imitation EN’ no. 1 and no. 2.

| Raw Imitation FR (no. 1)                                                                                                                                    | Raw Imitation EN (no. 1) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Rackham Pirat</b>                                                                                                                                        | <b>Donald Fake</b>       |
| 2,533                                                                                                                                                       | 2,174                    |
| 13,917                                                                                                                                                      | 11,259                   |
| -16.97%                                                                                                                                                     | -32.83%                  |
|                                                                                                                                                             |                          |
| DeepL translation of Reworked Imitation EN (no. 2)                                                                                                          | Transfer to Speedwrite   |
| Reworked Imitation EN (no. 2)                                                                                                                               | Raw Imitation EN (no. 1) |
| <b>Donald Fake</b>                                                                                                                                          | <b>Donald Fake</b>       |
| 2,363                                                                                                                                                       | 2,174                    |
| 12,405                                                                                                                                                      | 11,259                   |
| -25.99%                                                                                                                                                     | -32.83%                  |
| 15%                                                                                                                                                         |                          |
| Editing, minimal reformulations (in Word “track changes” mode) with the help of DeepL by Donald Fake.<br>Reinstatement of a few bibliographical references. |                          |

|                                      |                      |       |        |         |        |                                                                                       |
|--------------------------------------|----------------------|-------|--------|---------|--------|---------------------------------------------------------------------------------------|
| <b>Reworked Imitation FR (no. 2)</b> | <b>Rackham Pirat</b> | 2,491 | 13,714 | -18.18% | 6%/87% | Editing, minimal reformulations<br>(in Word “track changes” mode) by<br>Rackham Pirat |
|--------------------------------------|----------------------|-------|--------|---------|--------|---------------------------------------------------------------------------------------|

It is interesting to note that switching from one language to another reduces the abridgement effect observed between the “cleaned test” text and its English avatars. But the most notable result is that the similarity index reduces to 6% as long as Donald Fake’s text is not taken into account by the similarity detection tool. When the Turnitin platform takes Donald Fake’s text into account, the index rises to 87% and points towards this text, which had already been submitted to the platform. It appears that, if Rackham Pirat had done everything himself (EN-EN imitation with Speedwrite, then EN-FR translation with DeepL), then nothing would have been detectable: the similarity index would be rather low and no relevant source referred to. Thus, academic fraud appears difficult to detect when we combine several AI-based tools and work cross-linguistically. Therefore, these tools represent a significant potential for fraud.

This should encourage the continuation of research efforts on the part of the platforms that help detect academic fraud, particularly since it is evident that the texts produced violate several principles of academic integrity. *But we cannot call this plagiarism, at least not in the “typical” sense of plagiarism.*

As presented in Tables 1 and 2, a choice was made to call this type of text an “imitation”. This choice was made in the sense of an “artificial reproduction of the operation of an apparatus, a machine, a system, a

phenomenon, using a model or a computer program, for the purposes of study, demonstration, or explanation” ([www.cnrtl.fr](http://www.cnrtl.fr), our translation). One could say that this imitation “tries [...] to deceive others by imitating the appearance of a real thing” ([www.cnrtl.fr](http://www.cnrtl.fr), our translation). The ideas that have been retained are “ersatz” and “simulation”. Indeed, the Speed-write platform succeeds in simulating the writing process engaged in by human intelligence and producing a final text that is therefore an ersatz human intellectual production—that is, meaningful, authentic, and original. Therefore, we propose to call this type of academic fraud an “imitation”, which is in line with the work on text generators (Labbé, 2016), which indicates that these tools aim to *imitate* not only natural linguistic processes but also the linguistic norms of a given scientific environment.

### 3. The Potential Adverse Effects of AI Imitation Fraud

*A priori*, the potential harm caused by this type of fraud is significant. Here, we rely on the work IRAFPA has done since its creation in 2016 to complete its recommendations to qualify academic delinquency.<sup>4</sup> One way to approach this question is to examine the features it has in common with plagiarism. Concretely, if we refer to the “ten consequences of plagiarism” (Bergadaà, 2015b), there is almost no difference between plagiarism and imitation in terms of their consequences. Indeed, if we take these 10 consequences and characterize the two types of fraud, the result is as shown in Table 3.

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<sup>4</sup> <https://irafpa.org/en/methods/investigating-cases-of-plagiarism/the-ten-consequences-of-plagiarism/>

**Table 3**

*Imitation Compared to Plagiarism in Light of the 10 Consequences of Plagiarism*

|    | <b>Consequences of Plagiarism<br/>(Bergadaà, 2015b)</b>                                                   | <b>Plagiarism</b> | <b>AI Imitation</b> |
|----|-----------------------------------------------------------------------------------------------------------|-------------------|---------------------|
| 1  | Theft of an original creation and concealment of original authors/sources                                 | YES               | YES                 |
| 2  | Breaking of the chain of knowledge                                                                        | YES               | YES                 |
| 3  | Infringement of the original author's subsequent right to publish without citing the plagiarist/fraudster | YES               | NO                  |
| 4  | Dissolution of the meaning of the fraudulent work                                                         | YES               | YES                 |
| 5  | Fraud against society and access to undue social benefits                                                 | YES               | YES                 |
| 6  | Inducement to sloppy or untidy research                                                                   | YES               | YES                 |
| 7  | Malfunction of and disorder in scientific publishing and journals                                         | YES               | YES                 |
| 8  | Inhibition of competent researchers and of the 'right' to error                                           | YES               | YES                 |
| 9  | Damage to the image of HERI organizations and of the scientific community in society                      | YES               | YES                 |
| 10 | Rising economic cost of fighting fraud                                                                    | YES               | YES                 |

This analytical framework leads us to put forward the following three conclusions:

1. Imitation is clearly a fraud, because it directly causes 9 of the 10 consequences of plagiarism and all these consequences are violations of academic integrity.
2. The only aspect in which imitation appears to differ from plagiarism is that it does not directly jeopardize the subsequent right of the original author to publish without citing the fraudster: if the former does not identify any contribution of the latter in relation to their own previously published text, they could have the latitude to exclude it from their bibliographies (if the original author has published their work previously);
3. A text can be meaningful, original (in the legal sense: without antecedents) while still being fraudulent because it is not authentically produced by the author.

In fact, the second conclusion is problematic, particularly in the field of research. It is true that the author who is “robbed” is absolutely not compelled to cite the thief and, simultaneously, in the selected scenario, their own text, which came earlier. But it is possible to argue that the robbed author—potentially without knowing it or being aware of it—is, if not compelled, at least induced to cite the thief. Indeed, when working in a given scientific field, it is good practice not only to be aware of all the relevant literature but also to cite it. Thus, in our case, David Smith might find himself citing Donald Fake (and even Rackham Pirat), while remaining unaware that Donald Fake stole his words and did not produce an effective and original study. When David Smith reads Donald Fake’s words, he might at most be surprised by the similarity of their ideas. In this experimental example, David Smith is the unwitting victim of

Donald Fake.

On the other hand, the text produced by Donald Fake is definitely a fake. As a matter of fact, he used David Smith's text in its entirety to produce his own text, doing practically no work of his own; by publishing it, he suggests to readers that it is genuinely the fruit of his own research. Therefore, imitation fraud creates the possibility that we will encounter texts that will be original, in the sense that they will have no antecedents, but which have not been written and even less "thought of" by their declared author. As with plagiarism, the challenge lies in the lack of intellectual creation and, therefore, the prospect of collective impoverishment at the intellectual, cultural, and scientific levels.

But then, how should we interpret Table 3 if the 10 consequences of plagiarism highlighted by Bergadaà (2015b) are also recognizable consequences of imitation? Should we conclude that an imitation is actually plagiarism? Or should we deduce that the "10 consequences" proposed by Bergadaà (2015b) have a more general value and do not concern plagiarism alone? We propose that the second question should be answered in the affirmative. We consider that what we could call "the model of the 10 consequences" is a *relevant analytical framework* to characterize any academic fraud with regard to written productions (in particular, criteria 2, 4, 5, 8, 9, and 10).

#### **4. Prospective Analysis of the Impact of AI Tools on a Typology of Academic Fraud**

Just as plagiarism and its massification are directly linked to the emergence of the internet (Bergadaà, 2015a), the maturation of new information and communication technologies can only augur the appearance of new frauds (with regard to processes, behaviours, or consequences) or a change in the typology of academic fraud. Our predictive hypothesis is that AI and some of its potentialities, which we explore here, will lead to

this change. This in turn leads to a necessary questioning of the evolution of the typology of the main methods of academic fraud, at least with regard to the production of a text with a declared author; however, the scope of academic fraud is broader than this aspect of the production of scientific knowledge.

How can such a typology of methods be described today? First, it should be noted that a review of both the scientific literature and the publications of academic integrity stakeholders suggests that the currently dominant type of academic fraud is still plagiarism. Nevertheless, other frauds are well described in this specialized literature. Of particular note is the falsification (“forging”) and fabrication of data or information, referred to using different names and at different levels of detail (Ben-Yehuda, 1986; Gutwirth & Christiaens, 2015). Nevertheless, a scrutiny of this typology and the application of a substruction methodology (Lazarsfeld, 1970; see also Becker, 1998: “property space analysis”) make it possible to define a property space in which a fourth type of fraud appears in addition to those three. The fourth one is subcontracting (Figure 1), which is too often confused with plagiarism, whereas we propose to distinguish the two.

**Figure 1**

*Property Space Related to a Typology of the Main Methods of Academic Fraud*

|                       |              | Target of the deception |                    |
|-----------------------|--------------|-------------------------|--------------------|
|                       |              | Author                  | Contents           |
| Technical orientation | Substitution | 1<br>Plagiarism         | 2<br>Falsification |
|                       |              | 4<br>Subcontracting     | 3<br>Fabrication   |

The property space described in Figure 1 makes it possible to characterize, distinguish, and articulate four major types of processes based on the target of the deception, on one hand, and the technical orientation mobilized, on the other hand. This gives us four ideal types of academic fraud which, in a concrete situation, do not necessarily exclude each other, but can instead be combined or associated in the acts committed, the concrete procedures implemented, and their fraudulent textual results. Therefore, it is necessary to explain each ideal type in more detail:

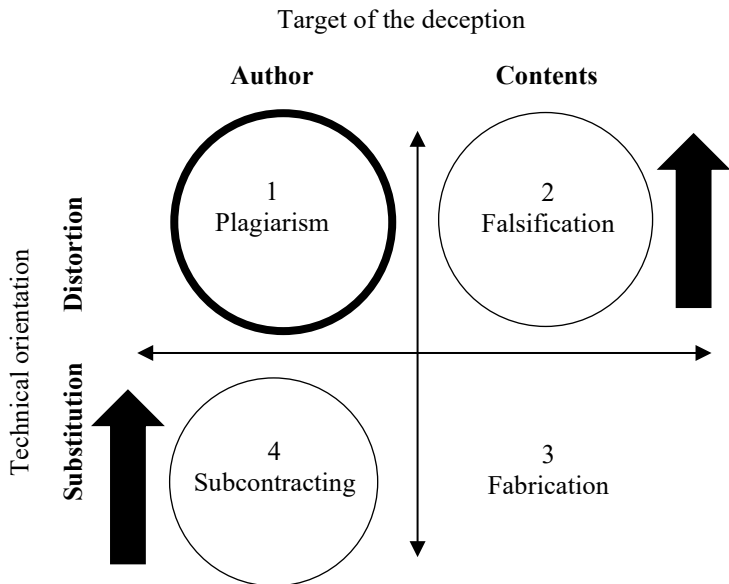
- Plagiarism: The process of copying, in a more or less literal form, a written text produced by someone else while attributing the production to oneself. Therefore, in this approach, plagiarism fraud concerns the actual author of the textual object. There is a direct victim—the plagiarized individual whose text the plagiarist appropriates by means of masking techniques that may be more or less sophisticated.
- Falsification: Processes that aim to or have the effect of distorting information, data, results, or a theoretical text to make them conform to a line of thought or conclusions established *a priori*.
- Fabrication: Processes consisting of describing or creating information or data that were never collected or produced, presenting treatments that were never carried out, or a text that was never “written”.
- Subcontracting: The process of having a research text written by a third party who is paid or rewarded in some manner, while the “client” takes credit for its production. Therefore, in a typical case of subcontracting, there is no victim.

This leads us to the current model described in Figure 2: plagiarism as the dominant academic fraud process, and falsification and

subcontracting as complementary frauds.<sup>5</sup> Various indicators and observations suggest that there has been an increase in subcontracting and falsification in recent years.

**Figure 2**

*Hypothesis Concerning the Current Dynamics of Academic Fraud*



By describing the ideal types of academic fraud in this way, it is possible to better understand the potential consequences of the emergence of imitation fraud using AI. Let us first examine subcontracting fraud: a client has a text written by another person and claims to be the author, which is a widespread practice in publishing. Indeed, without being able to

<sup>5</sup> The few quantifications we have available suggest that the dominance of different kinds of fraud probably varies significantly from one scientific field to another (see, in particular, Henriët & Ouzoulias, 2021).

quantitatively assess how widespread this fraud is currently,<sup>6</sup> the emergence of AI and its potential ability to write “original” texts could have the effect of pulling the rug out from under some of the beneficiaries of this intellectual delinquency market. In other words, it would affect this little-known business by tending to make it disappear.

Platforms such as Speedwrite can make subcontractors irrelevant, particularly since it appears likely that fraud using an AI platform will be much more economically competitive. As we face the future, this leads us to wonder about the possible evolution of the field of intellectual and scientific deviance. Indeed, if AI imitation fraud makes plagiarism irrelevant (particularly since, unlike plagiarism, it cannot be detected by tools that look only for textual similarities), it would also make subcontracting fraud irrelevant (particularly since, unlike subcontracting, its cost is extremely low and it requires very little work). This is also the hypothesis adopted by Abd-Elaal et al. (2019). It would lead us to a new situation described in Figure 3, if we consider imitation as a variant of “fabrication” that applies to a text and not to data or results. A text resulting from AI imitation is indeed “a text that has never been written by anyone”.

According to this hypothesis, in all likelihood, plagiarism is destined to disappear since the same AI that opens up the possibility of imitation fraud has already created the possibility of a much more effective fight against plagiarism. If we rely on the potential that our experiment appears to reveal, imitation fraud has advantages that no other type of fraud offers:

- Speed and flexibility of production.
- Undetectability (or rather “undecidability”) using most current textual similarity detection tools.

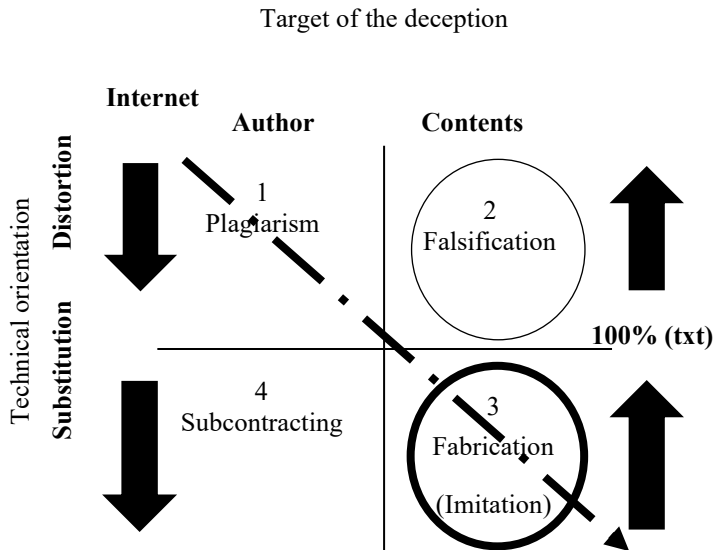
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<sup>6</sup> The offers observable on the internet and social media and their ongoing proliferation indicate that this kind of fraud is probably widespread: it is no longer a marginal phenomenon.

- Low cost: from US \$20 per month to US \$100 for one year, with a production rate of 6,000 “predictions” per month for the platform used. The text produced by Donald Fake (Tables 1 and 2) represents approximately 150 “predictions”.

**Figure 3**

*Hypothesis Concerning an AI-Induced Dynamics of Academic Fraud*



Considering all this, it is easy to imagine that the problem will arise not only in the production of documents published by researchers in scientific journals but also in the production of master’s and doctoral dissertations that conclude with the awarding of a state diploma.

In this section, we have analysed property spaces that allow for ideal types of fraud, but there is an important limitation: these frauds relate to the document issued and not to the entire research process. Thus, certain types of fraud or misconduct escape this typology (e.g., theft of

experimental data<sup>7</sup>). Therefore, research on property spaces to describe and characterize all the facts and processes of academic fraud remains open.

## **5. An Urgent Challenge for Academic Integrity**

The prospects opened up by platforms such as Speedwrite<sup>8</sup> and, more broadly, by the application of AI to text production pose new challenges for the gatekeepers of academic or scientific integrity, as well as the associated institutions or laboratories. In particular, these developments may require clarification regarding something that may have appeared to be clear in the past: What is academic or scientific work? How much work or which segments of knowledge production processes can be “delegated” to machines?

Obviously, the emergence of new fraudulent processes based on new technologies inevitably raises the question of their detection. In this regard, it is not too implausible to believe that AI itself will be what makes it possible to fight against the fraudulent use of AI, just as the internet has made it possible to fight against the fraudulent use of the internet, particularly plagiarism. Experiments using AI to prevent/combat the risk of academic fraud exist and already appear to have given satisfactory results with regard to university examinations (Ajmi, 2021). However, insofar as we do not currently have sufficiently powerful and proven tools to reliably detect imitations produced by AI, it is legitimate to worry about this imprecisely delimited period between the emergence of a new fraud opportunity and the time when we become able to effectively detect it.

After the emergence of the internet, it took approximately 10 years

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<sup>7</sup> This important limitation was identified based on the work of Decullier and Sèdes (2022).

<sup>8</sup> This includes the recent public controversy surrounding OpenAI.

before we saw the massification of plagiarism practices (Bergadaà, 2015a). Therefore, we have rather a short time to prepare ourselves to handle the new fraudulent practice of imitation, because the first technological developments are already over 15 years old (Abd-Elaal et al., 2019; Arnold, 2014).<sup>9</sup> Strictly speaking, these are not “new” technologies (consider the Ike Antkare case in 2010: Arnold, 2014; Labbé, 2016), but the technologies are maturing and are now being made accessible to an increasingly wide audience. Thus, academia did not adequately anticipate the emergence of this new situation affecting academic integrity.

Fortunately, private technology players engaged in the fight against plagiarism have seen this new breakthrough coming and have been able to prepare for it. Numerous start-ups are also engaged in research and innovation processes related to these issues (Roten et al., 2023). The market for the detection of AI productions promises to be a rather prosperous one because numerous public and private actors will require tools capable of differentiating a human production from an AI production.

Beyond this race against the clock to reduce the time until we are able to fight against a new form of academic delinquency, there is the problem of (technological) one-upmanship and educational, dissuasive, or repressive escalation: Where are we going? Asking this question is a way of suggesting that the answer to intellectual fraud can only very partially rely on tools to detect or prevent it. Indeed, reasoning in terms of a fraud/countermeasures dichotomy locks in an escalation of innovations that we do not believe will end any time soon.

Thus, while developing countermeasures in the short term, it is clearly necessary to engage in critical analysis of the sociological,

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<sup>9</sup> The first automatic text generator was developed by Jeremy Stribling, Max Krohn, and Dan Aguayo (then students at the Massachusetts Institute of technology) in 2005: <https://pdos.csail.mit.edu/archive/scigen/>. They generated a text and submitted it to a computer science conference to test its acceptability to a human reader. The text was accepted for the conference (Abd-Elaal et al., 2019).

organizational, political, and ethical frameworks within which this escalation process takes place. Thus the axiological emptiness in which our students and colleagues find themselves, sometimes against their will, is a much more important problem to tackle head-on than the technological problem of AI able to detect an imitation text.

The fight against academic fraud should not get bogged down in diversions (Gutwirth & Christiaens, 2015). Therefore, it is important to indicate that the magnitude of the possibilities now opened up by AI could obscure what we believe is essential for the integrity of science: linking research to integrity, intrinsically and in its very essence.

How can we picture a fight against fraud that is not at risk of diverting our attention (Gutwirth & Christiaens, 2015)? The capitulation of science and scientific communities to the rules of Randian liberalism is and remains the root of the problem, and not the appearance of a technology, even though it is necessary to develop accurate knowledge of the technology. This implies philosophically promoting integrity directly with our colleagues, our students, and our organizations.

## **6. Conclusion: Academic Integrity and Public or Private Decision-making**

The prospect of students and researchers using AI tools to produce texts without thinking about them or writing them—but which could pass through the barriers of grading and assessment—overturns several issues that are fundamental to the academic order:

- the sociological and political validity of the social benefits of holding university (or other) degrees and diplomas;
- the political and sociological acceptability of scientific results published in books or journals.

These socio-technical developments raise problems concerning

public confidence in the value attributed to diplomas (and, therefore, in the legitimacy of their holders), as well as in the value attributed to published scientific knowledge (particularly its reliability). Underlying this question of public confidence in the productions of the entire HERI system lies an even more fundamental problem for our democracies: trust in and legitimacy of public- and private-sector decision-making. Indeed, how can citizens trust and judge legitimate decisions that would make them

- doubt the skills and real knowledge of decision-makers (not to mention their “merits”), and
- doubt the reliability of the knowledge on the basis of which these decisions are made or justified?

From this perspective, the probable emergence of imitation fraud would not revolutionize the fundamental ethical situation. However, it appears to have the potential to aggravate (and perhaps accelerate) the political, social, and economic risks associated with the proliferation of intellectual fraud and related deviant behaviour. Therefore, the structuring and strengthening of the movement for integrity sciences remains an absolute necessity for our democracies and for the exercise of effective academic social responsibility (Bergadaà, 2020) by all HERI stakeholders.

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