Navigating Open Science and Research Ethics in the Basic Sciences: Insights from a Qualitative Study
Doctoral Forum - 8th WCRI

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Introduction

The aim of this thesis chapter is to document the transformations of research misconduct and questionable research behaviours under an open science environment.

RQ: Which is the role of open science to prevent questionable research practices?

Method

This project is built on a qualitative approach using semi-directed interviews as a research method. I conducted 29 interviews, each of which lasted around one hour.

Data collection for the interviews corpus was made in different stages:

1) Using the QS World University Rankings 2022 as a guide, the top 5 universities in Brazil, France and Peru.

2) After this identification process, basic science researchers - Biology, Chemistry and Physics- were contacted and interviewed if they agreed.

3) Interview transcriptions were analyzed using the Nvivo software.

4) The coding process used a thematic analysis with an inductive category development approach.

Method

Diverse pool of researchers, from all career stages

Code reflects discipline, career stage and country

Final Code	Title	Age Range	Country of work	Gender
P1.AP.F	Associate professor	30-35	France	M
B1.AP.F	Associate professor	50-55	France	M
C1.D.F	PhD Student	20-25	France	F
P2.D.F	PhD Student	20-25	France	M
B2.PD.F	Post Doc	30-35	France	F
C2.RS.P	Research scientist	40-45	Peru	F
P3.AP.P	Associate professor	45-50	Peru	M
C3.D.P	PhD Student	20-25	Peru	F
C4.PD.F	Post Doc	30-35	France	F
B3.RS.P	Research scientist	30-35	Peru	M
C5.RS.P	Research scientist	45-50	Peru	M
P5.AP.B	Associate professor	50-55	Brasil	M
C7.D.B	PhD Student	25-30	Brasil	M
P4.FP.P	Full professor	40-45	Peru	M
B4.FP.P	Full professor	40-45	Peru	M
P6.FP.P	Full professor	55-60	Peru	M
C8.D.B	PhD Student	20-25	Brasil	F
BQ1.PD.B	Post-Doc	35-40	Brasil	F
C9.PD.B	Post-Doc	25-30	Brasil	M
P9.PD.B	Post-Doc	35-40	Brasil	M
P10.PD.F	Post-Doc	30-35	France	M
C10.D.F	PhD Student	25-30	France	F
P12.FP.F	Full professor	55-60	France	M
P11.FP.F	Full professor	45-50	France	M
B5.AS.B	Associate professor	35-40	Brasil|Peru	M
B6.D.P	PhD Student	35-40	Peru|France	F
B7.PD.B	PhD Student	35-40	Brasil	F
P13.PD.B	Post-Doc	30-35	Brasil	M
BQ2.FP.B	Full professor	45-50	Brasil	F

Results

Misconduct and questionable research practices

Research misconduct and questionable research practices have been prevalent in academia even before the Open Science movement and their policies. These include idea stealing from supervisors or colleagues, scooping ideas from conferences, data stealing due to competition, and various forms of authorship conflicts and disputes.

This issue has been largely researched, as documented in the literature:

General (Aubert Bonn & Pinxten, 2019) (Hosseini & Gordijn, 2020) (Armond, et al., 2021)

Country specific

FR (Combes, 2022) (Leclerc & Klausser, 2024), BR (Armond & Kakuk, 2023), PE (Muñoz del Carpio Toia et al., 2023)

Misconduct and questionable research practices - Evidence found within interviews

Mainly related to:

Authorship issues: between researchers, between supervisee and supervisor

Data stealing

Idea stealing, scooping in conferences

Trust is essential to open science implementation, unfortunately these practices promote a lack of trust (+ competition)

Misconduct and questionable research practices - Evidence found within interviews

“I don't know if it's a theft of ideas, ***but sometimes it's the students who have the ideas. Basic, and obviously they don't have the background****, there's more to it, right? So it could be that and if I know of people who have had a good basic idea that they have lacked, uh, more breadth, I mean, like going a little bit further and that little bit further (...)*

So their supervisor saw it and it ended up being the supervisor's idea. No*?” (B6.D.P)*

“*The only bad thing which can happen, and it happens. I don't say it doesn't for example, y****ou discover something, you go for a conference, you make a small poster and then you present to other people and somebody sees it and say, oh, okay*** *...You know, like, and then* ***[he, she] repeats. similar thing and publishes immediately. Like, it's like a crappy paper, but still you are screwed because they just took your story****, you know? And, so they can steal your story, but they cannot steal your data. So they can, because you might lead them to something, which is very interesting (...) Usually when you discover something very interesting, scientists, like don't like to speak about immediately cause of that, they're afraid that somebody will just repeat that and then scooping, (B2.PD.F)*

Misconduct and questionable research practices - Evidence found within interviews

“If the collaboration is between different groups, because then the group can publish the data first and say, it's their data. But if the unethical thing happens inside the group, if the supervisor, for example, says an idea is here, uh, his or hers and not from the students, that will not help…it happened to me, yeah.. I have to change my PhD supervisor. Because I had an idea, I was analysing the data and then they publish, the paper was published before I knew…without my name. I issued a complaint in the university, but apparently it was my fault in the end. So, because of the hierarchy, complaints don't go far. (…) ***I don't know why they have this fetish to publish alone****, without a student, but it happens. For them, it doesn't make, uh, doesn't cause any problem. Publish in a paper with the students. It should, it should even be good. But some people doesn't think this way …and open science will not solve this.” (P13.PD.B)*

*“**So there are people who come and give you some tips and they want their name in the paper**. So they're investing on you like**, it's like dropping a coin and getting back a thousand**. So, there are people who do that and then they are stuck in this ethical loop (…) because we cannot ignore them because they gave a tip. At the same time we had to do the most part of the work. I respective said that they gave a tip, so they might have had it one sentence, which might be useful. Yeah. So there is this, control in the sense it's a kind of, knowledge control, as I said I mentioned earlier, it's a huge lobby to be frank.” (P10.PD.F)*

*"**Most of the time what they do, because if the paper has a lot of authors. They start to cut off like different authors, and most of the time it could be like the first person that will be out will be the immigrant**..So be certified. Your name will be for that, so you have proof that you perform the experiments and you are going to be an author as well….well, that is pretty sad. Like because, for example, as a student, of course, I am here to perform my experiments, learn new techniques, and share information. And so, when these things happen, it will affect my career. Like, because I am here to improve my career. So when I come back and, for example, they cut me off of the paper. Like not only the paper but, we know that the system we have to publish" (C7.D.B)*

Open science potential

Open Science has the potential to prevent and detect research misconduct through increased transparency, surveillance, and scrutiny by the community. Open data and preprints can serve as safeguards against misconduct by providing proof of authorship and enabling verification of research claims.

As documented in the literature:

By using open science practices, research can become transparent and accountable

(Bouter, 2023) (Haven et al., 2022)

Openness helps to support the self-regulation of research integrity (Laine, 2017)

Open science potential - Evidence found within interviews

“Something that explains eventually the possibility of ***[checking] the flows of open science, for instance, publications from journals that are not peer-reviewed or, you know, for instance, scientists that are going to publish 12 papers in one year.*** *And all the aspects of ethics in open science that might have to deal with scientific integrity.” (C10.D.F)*

“I would like my data to be deposited in a very safe place that anybody can pick it up if needed. Both, so I have the safety and if anybody one day says, I don't know, ***this data looks fishy. You know, there are problems with honesty and science. It's there so it can be checked and all that. So I think that's really important for my data (…)*** *Open data also is very useful for that. So as I said before, if you have this depository with your data there, if there's any doubt one day, you know, any question or whatever, you can go to that data and check it. And, you know,* ***if there is a problem, you fix it….And if there isn't a problem, you can prove that there isn't a problem, that it's all over there. So I think it helps a lot with the whole ethical problem also****, in addition to being a safeguard for us, and in addition to depending on the research field, opening data to other interpretations and other uses.” (BQ2.FP.B)*

“The data are shared now. ***So if someone publish something that is a little bit out of the standard, I think it can be denunciated very fast****.” (P11.FP.F)*

Open science potential - Evidence found within interviews

Some researchers see the potential, others do not see any relation: **Nuanced approach**

Open science is very useful in research outputs misconduct, not the behaviours

Effectivity of open science practices in research environments with a lot of competition for funding (challenging circumstances) should be noted too (Manco, 2023).

Open science + hierarchical and prestige-based nature of academia

However, Open Science alone is not seen as a complete solution due to the hierarchical and prestige-based nature of academia.

Power dynamics, concerns over academic reputation, and the existing culture of quantifying research outputs through publication counts can impede this potential effectiveness.

Open science + hierarchical and prestige-based nature of academia - Evidence found within interviews

“So I think in a way, research has, as I mentioned, ***boiled down to this, uh, uh, productivity game where you Yes. Produce a lot of things which are really wanted us to go.*** *So I think, I don't know how to remove it, but I think it has to change.* ***I don't know how to change it politics to, you know, win something, produce something****, or doing this race to get their publications in places, which is, even if it is of no use to the public or to the wellbeing of the planet. Mm-hmm. . So I think we, we should remove all the hierarchy of. Prestigious. You know, if you want to do research, you can do it.” (P10.PD.F)*

“I think these are very important things. Yeah. One research work. Is made by someone or by your team. And yeah, there are some those, there are some rights for the team. Like they, they build this, the, the results. So at least we have to cite them everywhere. Um, yeah, we have to cite them everywhere something that cares about. Yeah. Yeah. Ethically, it's important for me, that's a tough question. In, in, in, in the same way, uh, I, I don't know much, much about the law that exists already in terms of rights and replication. Yeah, but it is important. Yeah. Like there are some questions of ethics, at least behind, that should be, that we should pay your attention to. So, yeah, much work on that.” (P2.D.F)

Although open science has promise in tackling ethical misbehaviour, its efficacy may be impeded by the prevailing academic culture that prioritises productivity and publication metrics.

Open science + hierarchical and prestige-based nature of academia - Evidence found within interviews

For instance, preprints can prevent authorship stealing but paradoxically can also be misused by competing research groups to claim priority over findings, even in cases of unethical practices.

"*We sent the manuscript beginning of November, and we got the final acceptation. And once we had the Acceptation, We couldn't even publish on bioRxiv, it was too late.*

So we were, we were stuck. ***Meanwhile, our competitors, former collaborators, which turned into competitors, Released their own paper on January 31st. The very day we received the acceptation.***

I was giving a seminar that day saying, we had the final acceptance and then, it was the day after or the day before, whatever.

When A PhD student in my lab said, ***but they published it on bioRxiv…so we had to wait until May 1st, so that our own version of the work was publicly released. Meanwhile, in between January 31st and May 1st, , there was an open access version of the work without our name.*** *(…)*

And, it turned out that their version of the work had lower quality than ours. So we were better. So even if we were published after, Yes. If our version of the work was released after their own, Since it has been published and internationally recognized, acknowledged paper, Uh, I don't know, maybe...until now, we have like 500 quotations on this paper, whereas their own version of the paper is never quoted…then after they published, after they released it on Bioarxiv, they published it in a journal with a lower impact factor than the one we published.

So it has an impact. ***But they used Bioarxiv as a weapon against us. It was obvious. Pretending that they, that whatever the journal we publish, they would be the first.*** *But that's, I mean, I would have done the same if I were them, if I were at their, in their position, I would have done the same." (B1.AP.F)*

Science education to tackle research misconduct alongside Open Science practices

Science education, promoting scientific literacy, and having field-specific ethical committees are proposed by different interviewed researchers as complementary measures to tackle research misconduct alongside Open Science practices.

"Without education, explaining the knowledge of how a research career works or how a research is done, not the classic, this materials, objectives, this methodology, results, discussion, that is, not this, but what a research career really consists of having this knowledge gives you ***… It gives you the strength or the certainty to be able to claim what you consider to be a right. So a right, for example, or a right or a fault, not to claim for a fault not a right to claim for a fault, it gives you that power to be able to claim for a fault."*** *(B6.D.P)*

Questions

1. For the literature review, I found many good references written in English but since this research is based with researchers working in France, Brazil and Peru, there are empirical research references missing in these languages, countries (French, Portuguese and Spanish). Do you know references in these languages?

   Most of the literature I found is about an analysis of research integrity policies, not about behaviours (like this chapter)

1. Which (social) theory do you think would be most suitable to use in this project?

   For the whole manuscript: Merton, Bourdieu, Knorr-Cetina, Latour, Gibbons (knowledge production), Kreimer - something specific for these behaviours?

1. How would you recommend presenting results: mixing all by themes, presenting by country or subject differences?

Thank you!

References

Armond, A. C. V., Gordijn, B., Lewis, J., Hosseini, M., Bodnár, J. K., Holm, S., & Kakuk, P. (2021). A scoping review of the literature featuring research ethics and research integrity cases. *BMC Medical Ethics*, 22(1), 50.

Armond, A. C. V., & Kakuk, P. (2023). Research integrity guidelines and safeguards in Brazil. *Accountability in Research*, 30(3), 133-149.

Aubert Bonn, N., & Pinxten, W. (2019). A decade of empirical research on research integrity: what have we (not) looked at?. *Journal of Empirical Research on Human Research Ethics*, 14(4), 338-352.

Bouter, L. (2023). Why research integrity matters and how it can be improved. *Accountability in Research*, 1–10. https://doi.org/10.1080/08989621.2023.2189010

Combes, A. B. (2022). *Comment l'université broie les jeunes chercheurs. Précarité, harcèlement, loi du silence*. Autrement (Éditions).

Haven, T., Gopalakrishna, G., Tijdink, J., van der Schot, D., & Bouter, L. (2022). Promoting trust in research and researchers: How open science and research integrity are intertwined. *BMC research notes*, 15(1), 302.

Hosseini, M., & Gordijn, B. (2020). A review of the literature on ethical issues related to scientific authorship. In *Accountability in Research* (Vol. 27, Issue 5, pp. 284–324). Taylor and Francis Inc. https://doi.org/10.1080/08989621.2020.1750957

Laine, H. (2017). Afraid of scooping – Case study on researcher's strategies against fear of scooping in the context of open science. *Data Science Journal*, 16, 1–14. https://doi.org/10.5334/dsj-2017-029

Laine, H. (2018). Open science and codes of conduct on research integrity. *Informaatiotutkimus*, 37(4). https://doi.org/10.23978/inf.77414

Leclerc, O., & Klausser, N. (2024). From research misconduct to disciplinary sanction: an empirical examination of French higher education case law. *Research Ethics*. https://doi.org/10.1177/17470161241240241

Manco, A. (2023). Open science policies as regarded by the communities of researchers from the basic sciences in the scientific periphery. *Online Information Review*. https://doi.org/10.1108/OIR-03-2023-0135