



# The Gollum Effect: The Issue of Research Opportunity Guarding in Academia

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## INTRODUCTION

Despite conservation research becoming increasingly more collaborative over the last decades (Wuchty et al., 2007; Adams, 2013), access to resources, such as species, study sites, and sometimes even research topics or entire fields remain restricted. This is partly caused by scientists who have become possessively attached and guard these aspects of their research; an issue we refer to as the Gollum effect, inspired by the character from Lord of the Rings. Researchers exposed to the Gollum effect are disparaged or suppressed from conducting research by others who believe they have the sole right to do so and that permission is required. While rarely discussed, hogging research opportunities is equally as harmful as negligent academic gatekeeping (O'Dowd, 2014; Lee et al., 2021), parachute science (Asase et al., 2021; Stefanoudis et al., 2021), or the suppression of data accessibility (Harris, 1999). This is particularly the case for early career researchers, including graduate students, postdoctoral researchers, and junior professors, who already face often extreme power imbalances while trying to forge a career (Woolston, 2020). However, unlike the issues surrounding data sharing and accessibility, these resources and areas of study are not intellectual property that some have the rights to over others.

## THE CAUSE OF THE GOLLUM EFFECT

The Gollum effect can be attributed to the increased competitiveness in academia for funding, publishing, permanent positions, or scientific prestige (Auranen and Nieminen, 2010; Carson et al., 2013). Research opportunity guarding can help researchers prevent not only competition but also minimizes the risk of research being published that counters their own. A consequence is that already established researchers feel entitled to resources and topics and refuse to share them with others unless they are provided compensation such as co-authorship, even if unwarranted. As topics and study sites are often handed down from supervisor to student, the cycle continues indefinitely, severely hindering scientific progress, and placing research in the hands of a selected few. The Gollum effect can even be problematic by hindering the scientific review process if established researchers attempt to suppress a scientific article from being published *via* rejection. This ends up creating a power imbalance, with those with an already established career on a particular species, site, or topic having the capacity to control the direction of future research to ensure they maintain power. Journal editors rely on experts to help assess the quality of a study and may not be able to see instances of research opportunity guarding unless a formal complaint is raised.

A possible cause of the Gollum effect is the inability of researchers to separate aspects of their research that are intellectual property from those that are not. For example, while a researcher

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cannot argue that an entire field site is theirs, even if they have been conducting research for an extended period of time in the area, the design of structures placed within the site, such as traps, could be considered their property, with consent needed before they are used by others. This of course differs from the issues surrounding the use of data collected on private property or funded by stakeholders that can decide what can be published; another serious issue with conflicts of interest that have prevented the publication of important research findings by those that are funding it (Steele et al., 2019; Aagaard et al., 2021). Additionally, while a researcher cannot prevent others from studying a particular species in the wild, obtaining data on individuals that have been raised in captivity and subsequently released or artificially tagged remains a gray area in terms of ownership of data collected from these individuals; akin to the issues surrounding living IP's (Lawson, 2010). An established researcher may use their knowledge and power to find ways of inhibiting new researchers by exploiting the complexity that surrounds intellectual property within research programs (Sterckx, 2011), even when they have no legal grounds to do so.

## THOSE IMPACTED

Accounts of researchers who have been threatened if they conduct independent research are likely to be widespread. However, from our literature search it is clear that, like other forms of inappropriate behavior in academia (Mahmoudi, 2019; Jha, 2021; St Clair, 2021), instances of research opportunity guarding are not often reported. This makes it difficult to accurately assess how systemic this problem is and whether it is confined to particular research teams or fields. It is, however, apparent that this issue is expressed off the record in social situations, particularly between colleagues and friends, as there is a reduced chance of being chastised or a risk to career opportunities through public exposure from speaking out when anonymity is kept (e.g., Reich, 2009). Researchers may use social platforms, such as Twitter, to express their concerns and find a community of supporters (e.g., Custer, 2019), though at the potential risk of being exposed to others within their research team or wider scientific community.

The pervasive hyper-competitiveness and steep hierarchical culture in the sciences may drive people at various stages of their careers to commit research opportunity guarding and subsequent abusive bullying behavior (Täuber and Mahmoudi, 2022a), particularly when it is a behavior learned directly from supervisors. Researchers in positions of power may discount the work or ideas of individuals in a relatively lower position (Täuber and Mahmoudi, 2022a). This can be achieved *via* email, general conversation, gossip, or even at conferences after someone has presented their work; and can be regarded as a manipulation tactic conducted out of self-interest, rather than in the interest of scientific advancement (Mahmoudi, 2019, 2020; Jha, 2021).

Although research opportunity guarding can affect any individual, those disproportionately affected appear to be new researchers who find themselves stepping on the toes of established and/or senior scientists who are not willing to move

out of the way and are able to exploit the power dynamics at play to advance their careers even further (Täuber and Mahmoudi, 2022a). This includes master's and Ph.D. students, postdoctoral researchers, and junior professors, who already face often extreme power imbalances and cannot afford to lose their position (Woolston, 2020). These individuals are trying to gain a degree or forge a career and thus cannot risk losing their projects, publications, access to resources, and letters of recommendation (Täuber and Mahmoudi, 2022b). International students are also particularly susceptible due to their dependence on visa requirements, lack of social support, and cultural and language barriers (Mahmoudi, 2018, 2020). Of particular concern are also those individuals that are already more likely to experience other inappropriate behaviors, including women, people of color, and other underrepresented groups in the sciences, who are likely to experience this kind of disenfranchisement more frequently (Witze, 2018; Laland, 2020; Jha, 2021; Richard, 2022). Other victims of research opportunity guarding include those who try to apply novel ideas to fields new to them, but are discouraged from doing so by experts; a form of gatekeeping (Lee et al., 2021; Punt et al., 2021). Paradoxically, those who inflict guarding may be negatively impacted by their own actions through a gradual yet inevitable deterioration in reputation among peers. Of course, there is also an impact on the species, sites, and entire fields which are not able to be studied, protected and advanced, potentially contributing to the replication crisis in science (Kelly, 2019).

## INSTANCES OF THE GOLLUM EFFECT

To explore the different ways in which research opportunity guarding may present itself, we have provided several case studies below that are based on personal experiences and anecdotal evidence from colleagues:

**Case study one:** a researcher has reached out to an expert in a different field for advice on applying a similar methodology to an animal group that has not been investigated to date. The researcher is dissuaded by the expert who suggests that they are already considering doing the same investigation, despite having no true drive to do so. This research has since not been conducted and is unlikely to be without the assistance of a researcher who has an interest in this animal group.

**Solution:** The researcher can ask to collaborate with the expert. If they refuse, and the expert does not intend to conduct the research, the researcher should continue without their help, ask a similar researcher for collaboration, and ask the editor when submitting the research to avoid the expert as a reviewer.

**Case study two:** a junior researcher has just received a grant to conduct their own research to place data loggers in the field to study a target species. However, they are quickly threatened from deploying the loggers by another team that has previously used one of the selected sites to study the same species. This allows the established team to keep research control of the site, preventing future data from being collected without their permission and forcing the new research team into neighboring sites where the target species may be found in much lower numbers or not at all. While the new team has the necessary permits to enter the

site and install the loggers, they run the risk of losing favor with researchers who are well-known in their research field.

**Solution:** the researcher can offer to share the data acquired with the original team. Offering co-authorship on publications that derive from the data would be acceptable, but only if the original team provides significant contributions, such as previous data. Offering these partnerships will teach the new researcher interpersonal skills and problem solving around dealing with difficult man-made circumstances, which will likely occur more often in the future. If the original team does not want to collaborate, the researcher must then decide on whether they continue with their original plan and collect their data but risk possible retaliation from the more established research team.

**Case study three:** a Ph.D. student is reprimanded by their supervisor for having published a small, independent research project without listing them as a co-author while they were still completing their studies. This is despite the supervisor having no connection to the data that was collected or expertise in that project, and having provided no assistance in conducting the research or its subsequent publication. This assertion of dominance over the student ensures that the supervisor is given co-authorship for all future papers during the student's period of study, as the student does not want to run the risk of the supervisor negatively impacting their ability to finish their studies. Additionally, if the student's independent project negates the previous research of the supervisor, then their authority over the student allows them to prevent research in their field from being published which they do not want.

**Solution:** the student should inform the supervisor of the projects they are going to publish independently so that they are aware and also offer co-authorship if the supervisor can provide a significant contribution. If the supervisor tries to prevent the student from publishing, they can (i) turn to the supervisory committee or head of their lab, (ii) wait until after their studies to publish, or (iii) abandon the independent project entirely.

**Case study four:** a researcher submits a paper that is given a disparaging review by an expert in the field who has been enlisted by the journal as a reviewer. The study does not necessarily contradict the expert's previously published work, yet they feel the significance of the findings will threaten their academic status and subsequently attempts to discredit the study, leading to its rejection.

**Solution:** if the researcher already knows of potentially problematic reviewers, they should inform the editor of the journal during the submission process. However, sometimes there is no way for the author to know about possible negative reviewers or that the expert enlisted as an anonymous reviewer will disparage their work. During the review process, editors must therefore be aware of possible conflicts of interest and recognize negative reviews that are not due to the science but ulterior motives. Where necessary, the negative review should be rescinded if there is evidence that it is not related to the quality of the manuscript, and the manuscript should be subsequently handed to a different expert

in the field for review. The editor should also contact the reviewer, letting them know that their tone or accusations were inappropriate, their attitude contrary to the advancement of science, and that they will not be invited again to be a reviewer.

These case studies highlight unjustifiable roadblocks that remain in academia and the sciences, delaying research being conducted or published by those who are not directly connected to established career scientists who have laid claim to these resources and ideas. While we have presented potential solutions for each type of interaction with a research opportunity guarder, there may sometimes be no ideal outcome or resolution with the perpetrator; the Gollum may keep his ring in the end. Under these scenarios, the victim has to make a difficult choice to either risk retaliatory behavior by continuing with their research pursuits or simply back away, to the detriment of scientific knowledge.

## THE CONSEQUENCES FOR VICTIMS

Besides the impacts on scientific research, the most critical issue surrounding research opportunity guarding is the negative impacts it has on the victims. While not physically or legally barred from initiating or publishing their research, scientists in the situations we have presented may be hesitant to do so as they (i) are likely faced with an immediate loss of support from experts in the field, including supervisors who hold significant power over their study progression, (ii) run the risk of burning bridges with individuals who could be well-known in their field and able to place strain on their future career simply through word of mouth, (iii) could find it difficult to get their work published, and (iv) may risk advancement in their academic career. Victims who are faced with a research opportunity guarder may end up feeling a lack of control over their research, inadequate and isolated; as reported for other forms of inappropriate behavior (Jha, 2021). They may fear reprisal if they take action, and their standing within the scientific community may be placed at risk if guarders use manipulation tactics to protect themselves from the investigation (e.g., Mahmoudi, 2019); such as placing the blame on the victims publicly, thereby ruining their reputation.

Under such pressures, newcomers are likely to give up their research pursuits to find alternative ways forward to sustain their careers, such as by changing research topics or even institutes (e.g., Mahmoudi, 2020; Jha, 2021). This is of particular concern for underrepresented groups, including women and people of color, who may already feel as if they don't belong and need to follow what they are told to progress further (Zepeda, 2018; Laland, 2020; Ghosh, 2021). These disenfranchised groups in particular generally already feel uncomfortable reporting an issue as the preparator commonly holds a position of power and may harm their careers (Witze, 2018; Mahmoudi, 2019; Jha, 2021; St Clair, 2021). In some cases, such inappropriate behaviors force individuals out of the sciences entirely, taking with them unique perspectives and ideas, as well as valuable knowledge or skills, that are never considered or applied (Witze, 2018; Zepeda, 2018; Mahmoudi, 2020).

## DISCUSSION

With 65% of postdoctoral researchers negatively experiencing power imbalances (Woolston, 2020), research opportunity guarding adds to the current mental health crisis of junior researchers. Indeed, these individuals are already negatively affected by burnout, competition, stress, uncertainty, and self-doubt (Maher and Sureda Anfres, 2016; Evans et al., 2018; Eleftheriades et al., 2020). This will affect not only future generations of scientists but the future of scientific inquiry and research if a culture is not present that keeps researchers passionate about science and able to freely conduct high-quality work.

To continue to promote scientific openness that is already underway (Else, 2018), research fields, study sites, species, and topics must remain accessible. This challenge needs to be overcome by encouraging a culture of science etiquette between new and established researchers. New researchers should always reach out to others in their field, to ensure they are not disturbing populations, research programs, or sites currently in use. While collaborations should be favored, new scientists should not, however, have to ask permission from these outsiders to conduct their research, or fear retaliation if they want to study a research topic that is heavily guarded by an established researcher. Just like other causes of bullying, harassment, and discrimination (Moss, 2018; Woolston, 2021), it will be impossible to stamp out research opportunity guarding by relying solely on the good faith of individuals. Systems must be in place that protect new researchers and perturb others from contributing to this issue (e.g., Mahmoudi, 2019, 2020). We propose the following strategies that could be used in tandem to help control the Gollum effect:

**Institute policies and programs-** it will be highly beneficial for institutes to have policies in place that highlight the issue of research opportunity guarding, and its subsequent effects such as bullying and harassment. This should be coupled with mandatory programs that allow individuals to learn what the issue is and how it can be prevented (e.g., Mahmoudi, 2019). Institutions can also empower victims by having a code of conduct and making it easier for them to report incidences without fear of reprisal (e.g., Mahmoudi, 2018; Nik-Zainal and Barroso, 2019; Täuber and Mahmoudi, 2022b), unbiased investigations into all suspected cases (e.g., Mahmoudi, 2019), and open reporting of cases (e.g., Gunsalus, 2019). Other procedures that institutes can improve upon include their hiring practices with regard to positions of power, or introducing group-based advising so that one individual does not hold all the power (e.g., Witze, 2018). There are examples of individuals in positions of power, such as lab heads, being removed from grants in response to validated harassment complaints (e.g., Kaiser, 2021), indicating a shift in how academia and funding bodies are dealing with a large swathe of inappropriate behaviors.

**Society involvement-** scientific societies can also have a large influence on how science is practiced and they should be called on for a change. For example, societies have already been shown to have the power to remove bullies and sexual harassers (e.g., Mervosh, 2018), which could be extended to

research opportunity guarders. Some agencies such as the National Science Foundation in the US and the Wellcome Trust in the UK do not award grants or awards to those that engage in similar abusive behaviors (Mahmoudi, 2020), while the US National Academy of Sciences and the American Association for the Advancement of Science (the publisher of *Science*) actively remove these individuals from their ranks (Mahmoudi, 2021). Societies could also develop and promote workshops that build interpersonal relationships and increase networking opportunities to help mitigate some of these issues as well.

**Co-author transparency-** scientific authorship inherently contributes to power imbalances (Mahmoudi, 2019; Smith et al., 2020). Researchers should be able to publish in areas separate from their supervisors without feeling pressured to provide honorary co-authorship. This could be facilitated in part by journals highlighting the number of early-stage research scientists on articles that do not also have supervisors listed as co-authors and promoting such papers that excel in this regard. Additionally, it is vital that journals, as well as institutions, have clear policies and contribution requirements for authorship in order for many of the issues surrounding co-authorship to be avoided (Wager, 2009). However, this does not always resolve conflicts and while supervisory committees at institutes can settle disputes between students and their supervisors, this is a difficult step for students to take and one they may not wish to if they believe it could jeopardize their studies or standings with the institute.

It could be considered unfair to place the burden on students to stand against well-established researchers that have a long-standing with a particular institute. Indeed, other forms of inappropriate behavior are often overlooked due to the institutional support of perpetrators or to protect the institute's public image (Nik-Zainal and Barroso, 2019). Additionally, there may not always be other supervisors who can be used as substitutes in cases where the students feel their relationship with their supervisor is untenable after getting the committee involved. Therefore, teaching effective communication skills, and student-supervisor groups having discussions about authorship before and throughout the research process, can help avoid disagreements and potential issues before they appear (Smith et al., 2020). For situations that are difficult to work through independently, institutional support with a research integrity consultation or ombudsperson service may be required (Master et al., 2018).

**Online registries-** an online registry that shows instances of problematic reviewers would allow journal editors to more easily detect future instances of the Gollum effect and help ensure that new researchers are not discredited by influential individuals in their field that exert pressure on the direction research takes (Suls and Martin, 2009). This can be maintained by journal editors to avoid potential abuse of the system and allow for evidence that could be used to protect new scientists. Additionally, we also suggest that a registry is established that allows researchers to determine which species, sites and research fields have or are currently being investigated/used by other researchers. This registry would allow new researchers to get in direct contact with others in their field, providing proof of communication exchange

if any conflicts were to arise, while also allowing collaborations to occur more transparently and rapidly.

**The scientific community-** combatting the Gollum effect requires systemic change in academia and collaborative action by all individuals in the scientific community, regardless of their position or power (Mahmoudi, 2021; Täuber and Mahmoudi, 2022a). Although early career researchers and students are essential to science, they do not have much power alone. However, if organized they can be powerful and their strong voice can effect change by demanding better policies, transparency, and accountability (The 500 Women Scientists Leadership, 2018; Mahmoudi, 2021). Additionally, senior researchers, and those with power, must refuse to remain neutral and help create institution-level changes for a safer and equal scientific environment by acting as allies (The 500 Women Scientists Leadership, 2018; Mahmoudi, 2021). It is vital to increase awareness of the Gollum effect and make its occurrence public by sharing studies, reports, and personal experiences (Gunsalus, 2019). Journals can also play a role and bring this issue to light by encouraging more research on the prevalence of this topic (Mahmoudi, 2021). Currently, non-profit organizations such as the Parity Movement (<https://paritymovement.org/>) have led the way in protecting students, postdocs, early-career academics, and junior faculty members within academic institutions by fighting to end discrimination, misconduct, and bullying with the help of legal professionals, psychologists, researchers, and legislators.

**Guarders-** given their position of power, there will of course always be others willing to disregard the inappropriate behavior of guarders for the sake of exploiting career opportunities if it too good an offer. Unfortunately, there will also be those who feel there is no choice in order to maintain their careers. It is likely that some who guard do so unintentionally and are unaware of the harm caused by their actions. Instead of automatically removing these individuals from the community, it would be much more valuable to give them a chance to recognize their guarding and the impact it has had on others, and allow room for change and growth.

**Yourself-** if you experience the Gollum effect, it is important to learn to protect yourself and fight back. This may include documenting interactions, consulting your institution's mediation office, creating alliances with others that have gone through a similar situation, and preparing for retaliation. Most

importantly, you must remind yourself that you are worthy of pursuing science and that being a victim to this or any other sort of inappropriate behavior has no bearing on your value as a scientist.

## CONCLUSION

The Gollum effect is a phenomenon presently occurring within the sciences, and likely pervasive across institutions and research fields. This will affect not only future generations of scientists but the future of scientific inquiry and research if a culture is not present that keeps researchers passionate about science and able to freely conduct high-quality work. More research with precise data and open testimonies showing exactly where research opportunity guarding is occurring and exactly who perpetuates it and receives harm from is required. We want to spark a conversation that leads to future research on how it could be resolved, leading science into a new era where it is dispensed fairly. Lastly, we need a cultural shift that uplifts the future generations of scientists and promotes high-quality scientific inquiry, which starts with stamping out inappropriate behaviors that keep individuals from flourishing in the sciences.

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JG and JV: investigation, writing, review, and editing. All authors contributed to the article and approved the submitted version.

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