

Thesis Project Portfolio

Academic Integrity in Crisis: A Systematic Analysis of Questionable Research Practices

(Technical Report)

Profit Over Progress: The Hybrid Open Access Publishing Dilemma

(STS Research Paper)

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Executive Summary

The academic research community is threatened by the influx of false information and poor science entering the knowledge base. Specifically, researchers commit ethically ambiguous practices known as questionable research practices (QRPs) for various reasons. The technical project focuses on understanding QRPs and why researchers engage in questionable behavior. While conducting literature review for my technical project, I discovered the perverse incentives surrounding academic publishing, particularly a gross manipulation of researchers by commercial publishers. The research publishing community is hidden from the general population though it plays a significant role in driving innovation and progress within our society. Commercial publishers are profit-driven entities, and I was curious how this capitalist behavior interacts with the mission of academia as they pursue knowledge for the public good. For my STS research, I chose to investigate one journal publishing format used widely by commercial publishers to create profit. While the technical project provides an overarching view of the questionable practices in research and the systems driving these behaviors, the STS research zooms into one aspect of commercial publishing and explores its impact on society.

QRPs range from artificially inflating citation counts and manipulating images within papers to hosting fake conferences. The technical project aimed to synthesize the scope of these practices across disciplines and classify QRPs through a hierarchical taxonomy. The taxonomy was divided by individual misconduct occurring on a researcher level and organizational misconduct by for-profit companies or large institutions. The underlying incentives of the academic publishing industry act as drivers of QRPs, so the technical project sought to understand the perverse incentives creating demand for QRPs. For example, researchers often operate within institutions that value publication and citation count over research quality, and

companies known as paper mills supply opportunities for academics to purchase authorship to low-quality papers. Thus, the academic landscape and publishing systems hold responsibility for the pressures placed on researchers to commit individual QRPs. The taxonomy, scope, and incentive structure were discovered through a systematic literature review and interviews with experts in library science, copyright law, scholarly communications, and open science advocacy. Findings were validated through feedback from these experts and quantitative analysis through a time series analysis of publication output and a Welch's two-sample t-test. For further validation, case studies within the existing literature were identified for every QRP found in the taxonomy and placed within a dictionary. The taxonomy and research produced by the technical project should be used to identify concerning trends in QRPs and act as a basis for future work understanding the research industry.

Within the publishing industry, the rise of hybrid open access (OA) publishing reflects the complex system of power and interests among key players within the academic ecosystem. Hybrid OA allows authors to make individual articles openly accessible within subscription-based journals, representing conflicting incentives, values, and interactions between stakeholders within the field. The STS research within this portfolio applied the Social Construction of Technology framework to examine the prevalence of the hybrid OA model through the lens of librarians, commercial publishers, public and private funding agencies, and researchers. Interviews with scholarly communications experts, discourse analysis, and a literature review were used to examine the hybrid OA system. This paper found that commercial publishers have leveraged their market power to sustain revenue, using control over prestigious journals to drive researcher buy-in to hybrid OA. Libraries and researchers participate in hybrid OA to increase access to research, seeing hybrid OA as a better alternative to the traditional subscription-based

model. Furthermore, the evolving government mandates and funding agency policies surrounding open access have complicated researcher publishing practices. Some open access policies encourage hybrid OA while other funding agencies prohibit the use of grants to fund the practice. This research highlights technological and institutional changes in scholarly publishing as it affects accessibility and dissemination of knowledge. Additionally, the paper provides a deeper understanding of the imbalanced power dynamics between social groups. The findings of the STS paper can be used to inform strategies for increasing equitable access to research while driving innovation through the academic community.

The findings of my technical project heavily informed the results of my STS research paper. Both projects focused on understanding the underlying incentives promoting bad behavior through different applications. The technical work originally inspired my interest in hybrid OA and academic publishing. However, analyzing the publishing industry through the lens of hybrid OA allowed me to more deeply understand the research landscape that incentivizes QRPs. Both QRPs and hybrid OA are fueled by the forces of publish-or-perish and prestige. Additionally, these practices are embedded within the system and carried through academia as tradition. Some disciplines consider gifting a researcher authorship they did not earn, known as honorary authorship, not just acceptable but expected. In the same way, researchers publish in prestigious hybrid OA journals because they follow tradition and the example set by their peers. Completing this research in tandem offered a unique insight into why the academic system exists in its current form and how social groups interact within that space.