Research Methods and Professional Practice April 2024

Discussion topic 2: case study-Accuracy of information

My initial post:

The ethical dilemma faced by Abi in this case study brings to light important concerns about public trust, professional responsibility, and data integrity. The ACM Code of Ethics and the BCS Code of Conduct both have ethical guidelines that Abi must follow as a statistical programmer in order to disclose findings in a transparent manner. The ACM states that professionals must operate with "honesty and transparency" and "avoid harm" (ACM, 2018). Undermining these ethical principles is the presentation of just positive results or the use of selective analysis to portray Whizzz in a positive light without changing the data but by influencing how it is interpreted. Similar to this, the BCS Code cautions against "deception and misleading others" and stresses the significance of operating in the "public interest" (BCS, 2022).

Social harm may result from presenting only positive assessments since it may mislead customers and erode confidence in scientific research. Research has demonstrated that selective reporting, also referred to as "p-hacking," skews data integrity and introduces biases that mislead stakeholders (Gelman & Loken, 2014). In keeping with the BCS's emphasis on honesty and the ACM's demand for transparency, Abi may provide both positive and negative analyses along with a disclaimer to prevent potential exploitation of his findings.

The European Union's Unfair Commercial Practices Directive and other consumer protection rules mandate that marketing statements be true and not deceptive (EU, 2005).

This might be used selectively by the manufacturer, possibly breaking these regulations, if Abi only yields findings that benefit Whizzz. By adhering to professional norms and protecting consumers, Abi's dedication to ethical reporting guarantees that his work properly advances the public interest.

References:

- ACM. (2018) ACM Code of Ethics and Professional Conduct. Available at: https://ethics.acm.org/ (Accessed: 3 November 2024).
- BCS. (2022) Code of Conduct for BCS Members. Available at: https://www.bcs.org/media/2211/bcs-code-of-conduct.pdf (Accessed: 3 November 2024).
- European Union. (2005) Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32005L0029 (Accessed: 3 November 2024).
- Gelman, A. and Loken, E. (2014) 'The garden of forking paths: Why multiple comparisons can be a problem, even when there is no "fishing expedition" or "p-hacking"', Psychonomic Bulletin & Review, 21(3), pp. 451–467.

Post by Rory Maclean:

In the vignette, Abi considers how to analyse and present nutritional data for a product. Initially, it seems that the results do not support the company's claims.

First off, tampering with the data is clearly unethical (Gelman, 2018), and given regulatory frameworks, also likely be illegal (American Statistics Association, ND).

The more likely situation is the analyst's choice of analytic methods, and the selective presentation of results. For example, the choice of: descriptive summary measure, inferential statistic, null hypothesis, and subgroup analysis can all lead to different results (Horgan, 2001).

Ethical approaches to analysis include (American Statistics Association, ND):

1. A reproducible analysis script. The raw data, and all analysis code should be available to check for reproducibility. Scripted statistical analysis using a language such as R, Python, or STATA should be used.
2.
3. Pre-determined statistical analysis plan (SAP). A version-controlled SAP should be available, that was created before starting the analysis. Any amendments must be recorded and justified.

4. Professional review. A professional statistician should comment on and approve the SAP.

5. Sensitivity analysis. All reasonable analytic choices should be used in sensitivity analysis, and results presented.

What is Abi to do in this situation? Working within the corporate setting, they is more limited than an academic, who can chose to publish. They should present all the results, and clearly state which claims are supported or unsupported.

References

American Statistics Association (no date) Ethical Guidelines for Statistical Practice. *Default* Available from: https://www.amstat.org/your-career/ethical-guidelines-for-statistical-practice [Accessed 01 May 2024].

Gelman, A. (2018) Ethics in statistical practice and communication: Five recommendations. *Significance* 15 (5): 40–43.

Horgan, G.W. (2001) Statistical analysis of nutritional studies. *British Journal of Nutrition* 86 (2): 141–144.

My response:

Hello Rory,

Your post and analysis offer a comprehensive description of ethical issues in data analytics. A predetermined statistical analysis plan (SAP), sensitivity analysis, and highlighting reproducibility through an analysis script are all great recommendations that support integrity and transparency (American Statistics Association, n.d.). Additionally, upholding accountability in business environments is closely related to the significance of professional review. As you suggest, Abi would adhere to moral principles and offer a fair viewpoint by publishing both positive and negative findings, upholding customer rights and fostering confidence. In difficult data reporting settings, your points provide morally sound and workable solutions

Post by Michael Botha:

The importance of research ethics is well known amongst research professionals (Dawson, 2015). For instance, before a research project is undertaken ethical considerations need to be accounted for. Dawson (2015) lays a solid foundation by stating that integrity and honesty are paramount. He goes on to mention the important aspects of accurate methods, presenting all one's findings in an objective manner and the like advice.

The ACM (2018), the WHO (2011), as well as the IEEE (2020) discuss the importance for a researcher to think about the impact a study can have on society. The ACM (2018) mention the unbiased manner in which professional activities are meant to be performed. 2(b) of the BCS Code of Conduct for BCS Members notes the requirements for truthful criticism of work (BCS, 2022). A critical aspect the WHO (2011) discuss is the use of ethical committees to assess whether a study meets specific ethical criteria.

In light of the preceding points most of the answers pertaining to the questions presented can be answered. Although, this approach may be slightly naïve as shown by Bradely et al. (2020) who present various challenges facing ethical research. Essentially, the aforementioned best practices are the goal, however, some form of governance structures need to be in place to prevent untoward behaviour of those involved (Bradely et al., 2020).

References:

ACM. (2018) ACM Code of Ethics and Professional Conduct. Available from: https://www.acm.org/code-of-ethics [Accessed 15 June 2024].

BCS. (2022) Code of Conduct for BCS Members. Available from: https://www.bcs.org/media/2211/bcs-code-of-conduct.pdf [Accessed 15 June 2024].

Bradley, S., DeVito, N., Lloyd, K., Richards, G., Rombey, T., Wayant, C., Gill, P. (2020) Reducing bias and improving transparency in medical research: a critical overview of the problems, progress and suggested next steps. *J R Soc Med. 2020 Nov* 113(11):433-443. DOI: 10.1177/0141076820956799.

Dawson, C. (2015) *Projects in Computing and Information Systems: A Student's Guide*. Harlow: Pearson.

IEEE. (2020) IEEE Code of Ethics. Available from: https://www.ieee.org/about/corporate/governance/p7-8.html [Accessed 15 June 2024].

WHO. (2011) *Standards and Operational Guidance for Ethics Review of Health-Related Research with Human Participants*. Available from:

https://iris.who.int/bitstream/handle/10665/44783/9789241502948_eng.pdf?sequence=1 [Accessed 15 June 2024].

My answer:

Hi Michael,

thank you for your post and points mentioned in your post. It covers the importance of research ethics thoroughly, especially with regards to upholding objectivity and honesty. According to the WHO (2011), the focus on ethical committees provides an important layer of governance to guarantee adherence to moral principles. Additionally, Bradley et al. (2020) highlight the difficulties that ethical research frequently necessitates oversight to prevent prejudice and misbehavior, which is in line with your remark regarding the necessity of governance systems. By striking a balance between practical governance and ethical principles, researchers can better meet the requirements set by organizations like as the ACM and BCS, thereby protecting the research's social impact.

My summary post:

This peer discussion of Abi's case study involves a number of social, professional, and ethical obligations in data analysis, especially when it comes to reporting research findings honestly. In my first post, I discussed how the BCS and ACM Codes of Conduct emphasize openness, truthfulness, and preventing harm (ACM, 2018; BCS, 2022). Selective reporting, sometimes known as "p-hacking," damages customer confidence and can deceive them, as Gelman and Loken (2014) argue. It is recommended that Abi present both positive and negative findings in order to maintain ethical standards and prevent distortion.

Rory's essay went into further detail about ethical procedures that guarantee accountability and openness, like doing sensitivity studies, employing a predetermined Statistical Analysis Plan (SAP), and keeping a reproducible analysis script (American Statistical Association, n.d.).

Even in business environments, following these procedures preserves the integrity of data analysis and is consistent with professional norms.

Using the WHO's ethical supervision guidelines (WHO, 2011) and Dawson's (2015) emphasis on ethical research procedures, Michael's contribution emphasized the significance of integrity and governance structures. Bradley et al. (2020) point out that in order to reduce

prejudice and maintain standards, ethical research frequently needs external governance.

This conversation highlights the need of ethical analysis and reporting in upholding professional integrity, legal compliance, and public trust. A responsible research environment that complies with national and international standards is promoted by following these ethical norms.

References:

- *ACM. (2018) ACM Code of Ethics and Professional Conduct. Available at: https://ethics.acm.org/ (Accessed: 3 November 2024).*
- *BCS. (2022) Code of Conduct for BCS Members. Available at: https://www.bcs.org/media/2211/bcs-code-of-conduct.pdf (Accessed: 3 November 2024).*
- *American Statistical Association (no date) Ethical Guidelines for Statistical Practice. Available at: https://www.amstat.org/your-career/ethical-guidelines-for-statistical-practice (Accessed: 1 May 2024).*
- *Bradley, S., DeVito, N., Lloyd, K., Richards, G., Rombey, T., Wayant, C. and Gill, P. (2020) 'Reducing bias and improving transparency in medical research: a critical overview of the problems, progress and suggested next steps', Journal of the Royal Society of Medicine, 113(11), pp. 433-443. DOI: 10.1177/0141076820956799.*
- *Dawson, C. (2015) Projects in Computing and Information Systems: A Student's Guide. Harlow: Pearson.*
- *Gelman, A. and Loken, E. (2014) 'The garden of forking paths: Why multiple comparisons can be a problem, even when there is no "fishing expedition" or "p-hacking"', Psychonomic Bulletin & Review, 21(3), pp. 451–467.*
- *WHO. (2011) Standards and Operational Guidance for Ethics Review of Health-Related Research with Human Participants. Available at: https://iris.who.int/bitstream/handle/10665/44783/9789241502948_eng.pdf (Accessed: 15 June 2024).*