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Science Fictions Part I: Ought and Is

Q1. Why is the scientific process subjective?

The scientific process can be subjective due to biases in hypothesis formation, data interpretation, and the influence of prior beliefs or expectations on research outcomes. The book highlights how personal biases and the pursuit of positive results over negative ones can skew scientific inquiry.

Q2. Who owns the majority of scientific journals?

The majority of scientific journals are owned by a few large publishing companies. This concentration of ownership can impact the dissemination of scientific knowledge, affecting access and visibility of research findings.

Q3. Why is writing a good abstract critical for acceptance to one of the top journals?

A compelling abstract is crucial for acceptance into top journals because it's the first element that editors and reviewers assess. A well-written abstract effectively communicates the significance, novelty, and conclusions of the research, influencing the decision to review the paper fully

Q4. Why is the "Methods" section important for the scientific process?

The "Methods" section is essential for the scientific process as it allows for the replication and verification of results. Detailed methodologies ensure that other researchers can accurately reproduce the study to confirm findings or explore further

Q5. List and explain the "Mertonian norms".

These are a set of ethical norms proposed by Robert K. Merton to ensure scientific integrity: Communality (sharing findings), Universalism (judging research on its own merits), Disinterestedness (conducting research for the common good rather than personal gain), and Organized Skepticism (critical scrutiny of research).

Q6. What is "phlogiston" ?

This is a disproven scientific theory that postulated a fire-like element called phlogiston was released during combustion. The concept of phlogiston is used historically to discuss how scientific theories evolve over time with better understanding and evidence.

Q7. How did larger sample size and better technology disprove that slower walking is primed by "old" words. What explains the original findings?

Larger sample sizes and better technology can provide more accurate and reliable data, potentially disproving earlier findings. The original findings might have been due to small sample sizes, confirmation bias, or improper controls, highlighting the importance of rigorous methodologies.

Q8. Suppose an experiment shows a correlation with a p-value of 5%. What can you say about the probability that the experiment cannot be replicated?

A p-value of 5% indicates a 5% chance that the observed correlation is due to random chance, not an actual association. However, it doesn't directly speak to the replicability of the experiment; replication depends on the robustness of the methodology and the precision of the experimental design.