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David Sottile

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Cover Page Footnote

Correspondence regarding this article should be addressed to David Sottile, Western Michigan University, 3700 Wood Hall, Mail Stop 5439, Kalamazoo, MI, 49008. Email: David.w.sottile@wmich.edu

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Introduction

It is an unfortunate fact that scientists engage in research misconduct for their own personal benefit. As the scientific process has become more profitable, the number of scientists that engage in research misconduct has increased. Some of the more severe cases of research misconduct have become common knowledge across disciplines and within public spheres. For instance, many people outside of autism services and their families are aware of the Wakefield incident (Flaherty, 2011). What has become apparent in recent years is that more scientists are aware of research misconduct committed by their colleagues and do not report it.

Fanelli (2009) was a meta-analysis of many surveys taken by scientists regarding their colleagues and their own research misconduct. This study found that an estimated 1.97% of scientists surveyed admitted having fabricated, falsified, or modified data. In addition to this, 33.7% of the same sample of scientists admitted having engage in other questionable research practices including data falsification. An estimated 14.12% of this study sample admitted to having personal knowledge of a colleague who fabricated, falsified, or modified research data and an estimated 28.53% had knowledge of colleagues' questionable research practices. More pertinent to the scope of this paper is how often this research misconduct is reported by the scientists that had personal knowledge of these incidents of misconduct. The meta-analysis reports that only 46% had taken some action to verify their suspicions of fraud or to remedy the situation.

More recent as well as more troubling evidence of research misconduct occurring with the knowledge of other scientists comes from China. Last year, the Chinese State Food and Drug administration (SFDA), found that more than 80% percent of data from 1,622 clinical trials evaluating new pharmaceutical drugs had been fabricated (MacDonald, 2016). More troubling is that the extent of this data fabrication was apparently well known within

the industry itself. Normile (2017) discusses problems in the peer review process in the Chinese scientific community as well. 107 papers by Chinese authors were retracted due to misconduct during the peer review process. These articles have appeared in the same journal, *Tumor Biology*. 521 academics and physicians were linked to these papers with varying degrees of responsibility. This included 314 authors that did not appropriately observe their colleagues' behavior throughout the process and 70 authors that carry secondary responsibility. Within these 384 authors, it is likely there are some that were aware of this research misconduct despite not directly participating in the fraud itself. While the Chinese government is taking a greater effort to hold researchers accountable for these instances of misconduct, an exploration of research misconduct and those indirectly involved could benefit the scientific community at large.

The purpose of this paper is to explore the ethical concerns of research misconduct and why the whistle is not blown for all instances of this behavior. This will be done by describing a well-known instance of research misconduct followed by a discussion of the principles it violates, why research misconduct occurs, what strategies are currently in place to prevent this behavior or curb its effects, and why these strategies are not always effective.

The Stephen E. Breuning case

The Stephen E. Breuning case is one of the better examples of research misconduct (Scott, 1988). Stephen E. Breuning became a well-known researcher for his studies with developmentally disabled children. Breuning was claimed to have conducted several studies that showed promising results for the use of stimulants to treat self-injurious behavior within this population. Prior to this, the standard care for treating self-injurious behavior had been neuroleptic medications which have tranquilizing effects.

Breuning was reported for research misconduct by colleague Robert L. Sprague. Sprague (1993) details the entire process of

reporting Breuning's misconduct. Sprague began to have his suspicions regarding Breuning's practices in 1983 during a visit where Breuning's housemate claimed that Breuning had an inter-observer agreement of 100% for a behavior exhibited by children taking part in a study at a nearby developmentally disabled facility. Sprague's investigation revealed enough evidence of misconduct that he sent a letter describing all this evidence to NIMH. It would take years before anyone would take any action against Breuning despite an admission from Breuning regarding a portion of the data falsification. Breuning would eventually be the first federally funded scientist with a criminal conviction on charges of scientific fraud.

Stephen E. Breuning is a very common name to hear on Western Michigan University's campus in the context of research misconduct. Two of Breuning's former collaborators, Wayne Fuqua and Alan Poling, who were affected by Breuning's misconduct were and still are professors in the university's psychology department. Fuqua was a co-author on one paper with Breuning for one of Fuqua's graduate student's dissertation work. During the process of determining which of Breuning's papers should be retracted, the paper co-authored with Fuqua was found clear of research misconduct. Poling, who co-authored a total of ten publications with Breuning, would have one of his articles retracted. Neither Fuqua nor Poling were aware of Breuning's research misconduct until the case became public. Breuning's case example is used several times within a graduate level ethics course to illustrate the issue of research misconduct and its implications.

Contributing Factors

Why did Breuning do this? While we do not have a direct answer from Breuning, the consequences for successfully modifying data undetected are apparent. Many academic researchers' jobs are dependent upon whether their research studies show significant results. In addition to this, publishing a greater number of studies is also highly valued during the

process of obtaining tenure. The desire for prestige within the field may also be a contributing factor. Breuning's work became so well-known and influential that the policy of treating the developmentally disabled changed in Connecticut. Prestige also comes with greater monetary incentives as a well-known researcher is more likely to be invited to speak at conferences and other events held by their scientific community.

While these previous considerations assume a large degree of data modification this is not always the case. Changing or adding a few or even just one data point can also occur. In this circumstance, a contributing factor could be a confirmation bias held by the researcher. The researcher believes that the data must be caused by a confounding variable of some type and therefore must be discredited. This can occur because the researcher was already convinced of their hypothesis prior to any type of data collection. The idea of expectations can also affect the consumers of this scientific literature.

It is important to note that the results that Breuning were reporting were not unbelievable but expected by some members of the community. During an interview with the author of this paper, Dr. Alan Poling stated that he along with many others expected that stimulants could be more successful than neuroleptics for treating SIB in developmentally disabled children at the time of Breuning's work. By choosing to report results that were in line with the expectations of others in the community, Breuning reduced the probability that his study would be questioned at all let alone replicated. It wasn't until the data Breuning reported became too good to be true that Poling began to be suspicious. Sprague had begun the process of whistleblowing before Poling had the opportunity to confirm his suspicions.

Research misconduct and ethical principles

Scientists typically belong to professional groups pertaining to their discipline. These professional groups often

have a code of ethics for both clinical practice as well as scientific research. These codes of ethics are designed to guide the members of the organization to both protect the individual and those their work affects but also to protect the organization itself. In the case of Breuning, the most relevant professional organizations are the Behavior Analyst Certification Board (BACB) and the American Psychological Association (APA). While the BACB was not in existence at the time of Breuning's work, their scope of focus is like Breuning's as well.

Research misconduct, especially in cases regarding the treatment of a vulnerable population such as Breuning's, violate that the BACB and the APA stand for. The core ethical principles of behavior analysts as described by Baily and Burch's "Ethics for Behavior Analysts" are all about how a behavior analyst should treat themselves in with clients (Bailey & Burch, 2016). The three principles that are most apparently being violated when engaging in research misconduct are being truthful, pursuit of excellence, and accepting responsibility. As research misconduct involves a degree of deception, being truthful is impossible when one is falsifying data. Behavior analysts cannot pursue excellence if the information being provided by their researchers is false. There is no space for real evidence based treatments if a false treatment is being disseminated. In Breuning's case, policy in Connecticut was changed for how developmentally disabled children are treated. Accepting responsibility is also obviously ignored when someone deceives the public. The APA maintains a code of ethics as well that was violated in Breuning's work. The two principles of APA code that are clearly violated are principle B, fidelity and responsibility, and principle C, integrity. Fidelity and responsibility have clear connections to the behavior analyst's accepting responsibility while integrity has the same relationship with being truthful.

These ethical principles are not only being violated by the individual engaging in research misconduct but also by the individual that does not inform the proper authorities of

research misconduct. The results of the misconduct remain the same through the second individual's inaction. Therefore, there is a degree of responsibility on scientists to evaluate their collaborator's work.

Strategies of prevention and their limitations

There are several methods of detecting and reporting research misconduct. One method is preventing research misconduct from ever occurring in the first place. This can be done through proper ethical training in our undergraduate and graduate curriculum. Stressing on the importance of proper research and the dangers of misbehavior could stop someone who is at risk from this behavior from ever engaging in it. Unfortunately, no all people are responsive to this and not all ethical training is of the same high caliber.

The peer-review process is way of detecting low quality and fraudulent research publications. It involves the editor of the journal inviting three established researchers in the same field of study as the publication of concern to evaluate the manuscript prior to publication. A meticulous approach taken by these peer-review editors can reveal research misconduct sometimes. Most well-respected journals have a peer-review component in their process of accepting manuscripts for publication. Unfortunately, sophisticated delinquent researchers can hide their data in such a way that it cannot be detected through their manuscripts. In addition, some journals have questionable practices when choosing their reviewers. In the case of Normile (2017) discussed in the introduction to this paper, the editors of the journal allowed authors to nominate reviewers that were experts in the topic of their manuscript. The authors that engaged in research misconduct would secretly nominate themselves or other conspirators to write recommendations and reviews of the manuscript. This newly discovered method of subverting the peer review system is troubling as much of academia uses this as a primary method of evaluating new submissions.

Most universities have personnel that faculty can report their concerns to. This may be as large as an entire staff of people hired to handle a wide range of research issues besides research misconduct. There are protections in place for reporters of research misconduct such as anonymous ways of reporting and confidential meetings if anonymous tip is not sufficient.

Unfortunately, the information on how or who to contact is sometimes not sufficiently disseminated for appropriate use. Additionally, not all faculty members feel comfortable reporting their colleagues to begin with. Issues of trust and loyalty may take precedence over their suspicions when considering whether to blow the whistle. They may be concerned about how this person's research misconduct may affect their own work regardless of whether they have any collaborative work with the suspected offender. They may also be concerned about being incorrect in their accusations. While promises of anonymity can mitigate this concern, it may be severe enough to persist.

Another concern that should be noted is retracting fraudulent scientific publications from the literature. The journal where the publication was made can issue a retraction of said publication. An author on the paper can issue a retraction themselves either through the same journal or other media outlets. Databases which house the scientific literature following publication, either online or offline, can note the retraction in the original entry or simply remove access to it. Not all of these always occur for detected fraudulent research. Of specific concern, one of Breuning's research papers that had been officially retracted was cited in a paper 24 years later (Korpela, 2009).

Conclusions

Research misconduct is a complicated issue and cannot be easily solved. With the powerful incentives for engaging in research misconduct it is unlikely that we will eliminate misconduct entirely. With an imperfect detection system in place it is even more likely that some scientists will continue misbehave in

this fashion. Even though consequences are in place for gross research misconduct, they are not as severe for minor research misconduct if it even is reported. Even if scientific misconduct is detected and report, it can still take a long time for the literature to purge itself of these fraudulent studies.

Regardless of the difficulty we must continue to pursue excellence in our research standards. The damages are not limited to the scientific community and their reputations. Cases such as Breuning demonstrate the large amount of potential harm that can occur for vulnerable populations if we do not. Although in Breuning's case no harm has ever been discussed that came from using his techniques, the Wakefield incidence is an example of when this harm has come to pass.

The heads of academic departments and research institutions must take the lead in promoting an environment where integrity in research is encouraged and proper ethical training is being delivered. Faculty members must in turn encourage those in their spheres of influence to do the same. Graduate students and even undergraduate students can do the same with their research collaborators. The scientific community must continue to be vigilant against those who place the value of money and fame over knowledge.

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