

## **The social work environment of researchers committing scientific misconduct**

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### **Abstract**

Aspects of the social environment of the workplace where researchers conduct their work that are associated with scientific misconduct are discussed in this literature review. The organizational culture is addressed first, and findings are cited that show that perceived justice and differences between workplaces are associated with scientific misconduct. Next, workplace stress is discussed, along with the pressure to produce positive results, the ‘publish or perish’ culture, and the location of the workplace in the world all seem to influence scientific misconduct. Thirdly, interpersonal relationships are discussed and it is pointed out that misuse of such relationships in science, along with competition among researchers, can also have a negative effect on scientific integrity. Based on the findings presented, conclusions are presented in which the limitations of this review are acknowledged, and suggestions for future research are provided.

**Keywords:** scientific misconduct, work environment, organization, pressure, interpersonal relationships, competition.

### **Introduction**

Diederik Stapel made headlines in 2011 when it was discovered that he had committed academic fraud in many of his papers. This revelation shook the scientific community, because Stapel was a respected researcher and many of his papers were published in well-respected journals. After the fraud was discovered, Stapel was stripped of his titles and the esteem in which he had been held by the scientific community disappeared overnight. Because of this, Stapel can never work in research or social psychology again (Carey, 2011). Academic and personal repercussions of fraud of the kind committed by Stapel should serve as a stern warning for academic researchers. In addition to the consequences suffered by the individual directly concerned, scientific fraud has a significant impact on the scientific community. For example, research that contains fraud could be cited by others or used as a building block for new research studies. Despite these serious

consequences, scientific misconduct is still going on.

Scientific misconduct is a broad term that implies some combination of fabrication, falsification and plagiarism (FFP). Scientific misconduct can also involve specific Questionable Research Practices (QRPs), such as making data look better, data cooking, omitting inconvenient data, etc. (Steneck, 2006). These QRPs are more common than FFP, with a recent research study reporting that 2 percent of researchers admitted to FFP and 33.7 percent of researchers acknowledged having engaged in QRPs (Fanelli, 2009).

Preventing scientific fraud is an important task, one which first and foremost involves identifying the factors that influence scientific misconduct. The work environment of researchers is one variable that might influence scientific misconduct. Therefore, the question in this literature review is: “What aspects of the

social environment where researchers work lead to scientific misconduct?”

While there are different ways to approach the work environment, this article will explore aspects of the social context of the workplace. Organizational culture, pressures in the work environment, and interpersonal relationships in an organization will be discussed. Finally, conclusions are drawn in which the aspects of the social work environment are briefly discussed, and suggestions for future research are provided.

### ***Literature Search***

The literature used in this review was identified through searching Web of Science & Google Scholar in November 2012. All of the literature used in this review was published after 2005. The search included the key words academic fraud, academic misconduct, research misconduct, competition, organization, peers, work environment, workplace, scientific misconduct and integrity. The reference and citation lists of the articles initially consulted were also scanned for possible literature to be included as sources in this review.

### **Organization**

An organization is defined here as the overarching social entity in which a researcher works. The organization is thus an important part of the work environment, and values and norms of an organization may influence the behavior of researchers. Martinson, Anderson, Crain and de Vries (2006) conducted research to investigate this theory. Their goal was to investigate the relationship between self-reported misconduct and researchers' perceptions of justice in the organization in which they work. Martinson et al. (2006) investigated both distributive and procedural justice and also addressed whether perceived threats to researchers' identity affects the relationship between procedural justice and self-reported misconduct. Distributive justice refers to the fairness in the

distribution of resources by an organization. Procedural justice refers to the fairness in processes and procedures in the distribution of these resources (Martinson et al., 2006). There was also a distinction made between researchers early in their careers and more experienced researchers. The instrument used was a survey that measured both attitudes toward the workplace and behavior in the workplace. The results showed that procedural injustice is significantly associated with self-reported misbehaviors. Although Martinson et al. (2006) did not find a significant relationship between perceptions of distributive justice and self-reported misbehavior in the total sample, this relationship was found to be significant for early-career researchers. Martinson et al. (2006) report that this is consistent with their theory that reported misbehavior is found more among researchers who are more likely to perceive threats to their identity. This research shows that the perception of researchers regarding the organizations in which they work is associated with scientific misconduct. However, since only the relationship between the perception and self-reported misconduct was investigated, it is not clear whether the work environment causes the misconduct or whether the misconduct helps shape the work environment.

Martinson et al. (2006) showed that perceived justice in an organization is associated with reported misconduct. Pryor, Habermann & Broome (2007) took another approach to looking at the organization in which a researcher works. Instead of self-reports of researchers, they surveyed research coordinators from the United States about scientific misconduct, and reported a low frequency of perceived scientific misconduct. However, there were differences among workplaces with regard to the perceived pressures on both researchers and research coordinators. The discriminating factors were financial rewards and workload. For example,

research coordinators from academic centers rated 'pressure for external funding' as 'high' or 'very high', whereas research coordinators from private sector organizations often rated this pressure as very low. In this study, evaluation of the workload of the research coordinators took into account the number and intensity of protocols for which the research coordinator was responsible, as well as the possible low involvement of the principal researcher. The number of protocols for which the research coordinator was responsible was described by 55 percent of the research coordinators as having some influence on misconduct.

Another difference highlighted in this study was the regulatory environment in each research setting. The data from this study supports the notion that clear institutional policies and rules reduce scientific misconduct (Pryor et al., 2007).

It can be concluded that, on the basis of this particular research, there are differences between organizations when it comes to perceived pressure and scientific integrity. An organization where both the pressure for external funding and the workload of research coordinators are high seems to have more reported scientific misconduct than an organization where the pressure for external funding and workload are both low, and where there are clear institutional policies and rules. A limitation of this study is that only research coordinators were surveyed and only the workload of research coordinators was assessed. However, this study also shows that it is not only the work environment of researchers that influences scientific misconduct. The work environment of researchers' colleagues (in this case research coordinators) is also associated with the scientific misconduct of researchers.

As stated above, the results obtained by Pryor et al. (2007) implied that institutional policies decrease scientific misconduct. A research study conducted by John, Loewenstein & Prelec (2012)

lends support to this theory. The goal of this study was to measure the prevalence of questionable research practices. This study also used a survey to collect data, but instead of research coordinators, it was psychologists who were surveyed. The results of this study showed that researchers differ in their opinions as to which questionable research practices constitute scientific misconduct. The opinion of a researcher in regard to scientific misconduct seems to be related to the discipline in which a researcher works. Questionable research practices were found more among the cognitive, neuroscience and social disciplines of psychology, and less among clinical psychologists.

In contrast to the study by Pryor et al. (2007), John et al. (2012) found a high prevalence of psychologists admitting to QRPs. However, this difference can be explained by the fact that the research by Pryor et al. (2007) asked about scientific misconduct and John et al. (2012) asked about QRPs, which include less serious offenses. However, the results of both studies indicate that research integrity is compromised.

These research studies all lend support to the notion that the organization in which a researcher works influences scientific integrity. This could result from one or more of the following factors: the perceived justice, workload, financial rewards, or perceived policies of the organization.

### **Pressure**

The next aspect of the work environment that will be discussed is pressure. This variable was already mentioned in the context of the research conducted by Pryor et al. (2007), who found that financial rewards and workload influence research integrity. De Vries, Anderson and Martinson (2006) held six group interviews with researchers about their perceptions of possible scientific misconduct. The results showed that one of common problems in

the work environment as reported by the social scientists, is the high pressure that they experience. This stress results from such factors as the influence on research by funders, conflicts of interest that go unreported, ideas for conference papers and grant proposals that get appropriated, and engaging in conduct such as publishing the same research more than once, and the withholding of 'inconvenient' data. According to De Vries et al. (2006), "the need to produce" was often correlated with the need to secure funding. Sometimes companies external to the workplace of social scientists make demands which jeopardize the integrity of research (de Vries et al., 2006). This study shows that the pressures that researchers face in their work environment can come from the workplace itself, as well as from sources outside of the workplace.

De Vries et al. (2006) discussed different examples of pressure in the work environment. However, there is another form of pressure that De Vries et al. (2006) did not discuss: competition. The relationship between competition and scientific misconduct has been investigated in a number of different ways. Fanelli (2010) investigated the number of times 'positive' results were reported in studies drawn from a large random sample of scientific papers, whose authors are based in the United States. In this case, positive results mean all results that support the hypothesis of the research study (Fanelli, 2010). According to Fanelli (2011), positive results do not imply QRPs in itself, but might distort the scientific literature. For example, when negative results (i.e. results do not support a certain theory) are not published, a scientific theory might be regarded as true. However, there might be more research not supporting this theory than research that does support this theory. The results of the study by Fanelli (2010) showed that positive results were more frequently found in competitive environments. The

question that must be asked then is: What is a competitive work environment? Fanelli (2010) operationalized a competitive work environment as the work environment of researchers that worked in states in the US that produce more academic papers *per capita*. The results of this study indicated that the environment of a workplace producing more published papers is more competitive. This is a possible consequence of the 'publish or perish' culture, where organizations focus on the number of papers published when making financial decisions (e.g. who gets funding) and implementing a system of rewards (Van Dalen & Henkens, 2011).

Instead of looking at research papers, Van Dalen and Henkens (2011) used a worldwide survey to assess how the 'publish or perish' culture is perceived by members of an international association for demographers. They surveyed demographers because demography is a science that embraces a wide variety of disciplines and because, when it comes to publication and citation practices, demography functions like many other social sciences. Results from their study show that publication pressure is positively associated with consequences of the 'publish or perish' culture. This means that high pressure to publish is associated with more researchers disregarding policy issues, researchers having less incentive to publish in journals that are national in scope, and a large number of unread publications. However, the 'publish or perish' culture can also be positive. For example, higher academic status is also associated with publication pressure (Van Dalen & Henkens, 2011). It is important to note that, according to Van Dalen & Henkens (2011), publication pressure is not perceived in the same way in different parts of the world. For example, other countries are far more worried than the US that the pressure to publish will negatively affect local knowledge. This is because researchers outside the US have greater incentive to publish in US journals,

because such journals are more prestigious than journals from their own countries. On the other hand, in emerging economies, researchers find that the pressure to publish brings out the best in researchers. Thus, knowing the country where a researcher works is important in the perception of that researcher about the positive or negative consequences of the ‘publish or perish’ culture.

### **Interpersonal relationships**

Until this point, only the organization and pressure in the work environment have been discussed. Another variable of importance in the work environment is that of interpersonal relationships. Examples of interpersonal relationships in the work environment include interactions between and among peer-researchers, peer-reviewers, supervisors, junior colleagues, professors, etc. The focus groups in the study by De Vries, Anderson and Martinson (2006) provided examples of problems in interpersonal relationships, such as manipulation of the review system, difficulties in assigning authorship, the exploitation of junior colleagues, appropriating ideas from papers and proposals, and ignoring teaching responsibilities.

Anderson, Ronning, de Vries and Martinson (2007) addressed a combination of the previously discussed subjects of competition and interpersonal relationships. In their study, focus groups of early- and mid-career researchers were used as a measure to analyze the effects of competition in science. The results of these focus groups showed that none of the researchers mentioned positive effects of competition on their work. When it comes to interpersonal relationships, the researchers stated that competition interferes with peer reviews and distorts relationships. The researchers also mentioned that the sharing of information and research methods declined because of competition, and that competition contributes to sabotage of others’ ability to

use one’s work. Competition also increases the likelihood that a scientist will engage in scientific misconduct, and compromises scientific integrity (Anderson et al., 2007). This study shows that competition is a major influence on interpersonal relationships, and that competitive relationships in turn have a negative effect on scientific integrity.

Wong and Hodson (2010) also conducted a study that took into account the views of researchers regarding their interpersonal relationships. In this study, 14 scientists shared their views on science. According to this study, peer review is a key aspect of the social dimension of science. A scientist cannot work alone, and research papers need to survive the scrutiny of the scientific community in order to contribute to the existing body of knowledge (Wong & Hodson, 2010). De Vries et al. (2006) also noted that manipulation of the peer review system is a problem. Peer review is an important part of research, but can also cause problems for scientific integrity when misused. Another way that interpersonal relationships can be misused is when researchers try to cultivate friendships with journal editors in order to get their research papers published. This can lead to favoritism by journal editors, which in turn causes damage to the integrity of science and scientific journals (Wong & Hodson, 2010).

Interpersonal relationships are not only an important aspect of the work environment of researchers, but also of the community of social scientists in general. Competition can have a negative effect on these relationships, which then has a negative impact on the integrity of research. Misuse of interpersonal relationships can also make the likelihood of scientific misconduct greater. Thus, interpersonal relationships in the work environment can contribute to scientific misconduct, when they are either overly competitive or overly friendly.

## Conclusion

The research studies that have been discussed in this review show that the social environment of the workplace of researchers is associated with scientific misconduct. These social aspects that may affect scientific integrity have been grouped into three broad categories; organization, pressure and interpersonal relationships. Organization was the first variable discussed. The perceived justice of the organization and differences in workplaces influence both the integrity of scientists and the opinion of scientists about what scientific misconduct is.

The second issue discussed was pressure, which can lead to the need to produce and secure funding. The existence of pressure also makes it more likely that a researcher will report more positive results. Also discussed was the ‘publish or perish’ culture that goes hand in hand with pressure. A high publication culture seems to make the likelihood of scientific misconduct greater, but the strength of this relationship will vary depending on workplace location and on how positive or negative such a ‘publish or perish’ culture is viewed.

Finally, interpersonal relationships in the work environment were discussed. Competition, which was also discussed along with pressure, seems to have a negative effect on interpersonal relationships. Mistrust of peer-researchers, manipulation of peer-reviews and favoritism by journal editors all can have a negative effect on scientific integrity.

A limitation of this review is that the research studies used show whether there is a relationship between the work environment and scientific misconduct, not whether the work environment *causes* the scientific misconduct. Future research should further examine the nature and direction of this relationship.

Most of the studies discussed in this review used surveys or focus groups as research methods. The opinions and perceptions of scientists, as well as other

functions in science, were assessed, and the resulting findings can offer a great deal of insight into the world of social science. However, because it was the *perceptions* of social scientists that were assessed and not actual behavior, these results might misrepresent their actual *behavior*.

Another limitation of this review is that the influence of the work environment is a broad subject that possibly includes more relevant variables than those mentioned in this review. More research is necessary to assess these different variables. However, those addressed in this review can serve as a basis for designing preventive measures, and for providing an overview of the currently available research on the work environment.

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