Promoting Integrity as an Integral Dimension of Excellence in Research

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Scientific misconduct and integrity: An organizational perspective

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1 Introduction

Misconduct in and by organizations has been a prevalent topic in the social and organizational sciences for several decades, involving a variety of academic perspectives such as law, psychology, economics, anthropology, and sociology. High-profile scandals of fraud and corruption involving the likes of Enron, Elf and Lehman Brothers in the 2000s illustrate some of the ways in which misconduct may manifest itself in business organizations, and the devastating impact this may have on society. As a result, there is a great pressure on business and other types of organizations to manage their employees' behavior in ways that reduce or eliminate illegal or unethical conduct.

The scientific field – understood here as public and private research institutions, funding bodies, and governmental research administrations – has undergone a similar development. In recent years, several cases of scientific misbehavior have been described in the media, such as Korean stem cell research Hwang Woo Suk, Dutch social psychologist Diederik Stapel, and Norwegian oncologist Jon Sudbø. Like in the business context, there has been a growing focus on scientific misbehavior in the scientific field – with an overall intention being a desire to strengthen the integrity of researchers and research institutions. Alongside these developments, public debate has also become more critical and informed, with an increasing number of discussions regarding notions of trustworthiness and integrity in the research process.

To date, most of the public and academic attention on scientific misconduct and integrity is based on an assumption that misconduct is carried out by individual researchers with varying degrees of integrity, acting opportunistically in their own self-interest. Classic examples of scientific misconduct includes fabricating or falsifying data, or plagiarizing the work of others, but also grey-area practices such as called "salami slicing", where one data set is used to publish several articles with the intention to improve academic publication records, is common. Conversely, the emphasis on individuals is also evident in how the media and other discussions in the public treat scientific accomplishments, where notions of the "academic superstar" are common.

An element that is strikingly underemphasized in these assumptions and discussions is the acknowledgment of researchers as organizational actors, that is, influenced by their organizational context. Rather than emphasizing individual misbehaviors, focus is broadened to include the social and organizational structures that influence how researchers conduct their research. Some of these structures are located at the workplace, for instance the type and extent of research that is expected of researchers. Other structures are located above the workplace, at the field level, and involve factors such as pressures to publish in order to obtain an academic job, or new and more complex ways of interacting with other researchers or publishing one's academic results, where ethical norms become more blurred and ambiguous.

On this basis, the present chapter has three central aims: First, to elucidate central organizational causes and conditions for scientific misconduct, based on a review of the literature. Second, to discuss the topic of research integrity from an organizational perspective. Third, to sketch out a research agenda for organizational studies of research misconduct and integrity. It must be emphasized that the organizational emphasis here does not involve a disregard of individual explanations of scientific misconduct – e.g. differences in moral character or integrity – but takes as point of departure that different ways of organizing research will affect the likelihood of misconduct. An assumption is thus that individual ethical conduct can be managed, and successful management or leadership will contribute to research integrity.

We will in the following first give a brief introduction to scientific misconduct and integrity, and then describe in some depth organizational perspectives on scientific misconduct. Subsequently we will describe integrity and introduce a concept of organizational integrity work. We will conclude the chapter with a summary for transforming these insights into a research agenda and a program for practical organizational integrity work.

2 About scientific misconduct and integrity

There is no European or international agreed-upon definition of scientific misconduct and many authors and institutions hesitate to give one. The European Science Foundation (ESF) and the ALLEA (All European Academies), which have been central in developing a European approach to misconduct (see The European Code of Conduct for Research Integrity), avoid giving a definition, but list the many 'disguises' of misconduct: fabrication, falsification, plagiarism, failure to meet clear ethical and legal requirements, improper dealing with infringements, and minor misdemeanors (2011, p. 6).

However, definitions exist, and one example is the definition by the US National Science Foundation: '(a) Research misconduct means fabrication, falsification, or plagiarism in proposing or performing research funded by NSF, reviewing research proposals submitted to NSF, or in reporting research results funded by NSF' (NSF Regulation 45 CFR 689). It is clear that research misconduct requires an intention or gross negligence: '(b) Research misconduct does not include honest error or differences of opinion' (ibid.).

Likewise, there are several approaches to research integrity (which more or less can be understood as the opposite of misconduct). Science Europe states that research integrity is usually understood as 'the performance of research to the highest standards of professionalism and rigour, in an ethically robust manner' (Science Europe, 2015, p. 3). However, many actors instead outline principles of research integrity, rather than definitions. In a statement from December 1st 2015 The Council of Europe agree with principles for research integrity expressed in the European Code of Conduct: honesty, reliability, objectivity, impartiality and independence, open communication, duty of care, fairness, and responsibility for future science generations (Council of Europe, 2015, article 7).

There are also several approaches to explaining research misconduct. David Goodstein (2002: 3-5) lists three risk factors that he claims often characterize instances of scientific misconduct. One is career pressure, that is, the increase of competition for funding and for tenure. Another is "knowing the answer", that is, the researcher thinks he or she knows the results of the study if it were to be carried out properly, but decides to avoid the trouble of doing it properly. A third is the perceived difficulty of reproducing the research.

In addition to these risk factors, there has been some research on the causes implied in misconduct. Davis et al. (2007) studied the closed cases registered in the files of the US Office of Research Integrity (ORI). They identified the following causes: (1) personal and professional stressors, (2) organizational climate, (3) job insecurities, (4) rationalizations A, (5) personal inhibitions, (6) rationalizations B and, (7) personality factors.

These explanations point in large part to institutional and organisational factors; however, the authors do not go into depth on these. We believe that a richer understanding of such factors are

both of academic and practical interests, and will thus in this chapter explore such factors in more detail from an organizational perspective.

We treat scientific misconduct relatively broadly as misconduct, and not in terms of specific features of scientific misconduct such as fabrication, falsification or plagiarism, which may differ in some respects in terms of the organizational causes and conditions. In subsequent work in the PRINTEGER project, we will attempt to further explore differences between different types of research misconduct.

3 An organizational perspective on scientific misconduct and integrity

3.1 Why individuals engage in misconduct

According to Greve, Palmer and Pozner (2010: 57-58), theories individual misconduct fall into two main categories. First, that individuals decide based on normative assessments about the appropriateness of their behavior (March, 1994). By this is meant that if a behavior is regarded to fall within certain normative frameworks, individuals will carry out that behavior. For instance, when they conclude that a wrongful course of action is consistent with their norms, values and beliefs, for them that course of action is right. Hence, if a researcher regards falsification, fabrication, plagiarism or more grey zone practices as in accordance with their norms, beliefs and values of "proper" or "normal" research, they will carry out those actions.

Second, that individuals undertake consequential decision-making by weighting the pros and the cons of a wrongful course of action; if the pros outweigh the cons, they will carry out the wrongful course of action (March, 1994). Hence, if a researcher believes that the effects of misconduct – such as increased social and economic capital – outweighs the perceived risk of being caught, he or she will do it. However, also here are normative assessments involved; the guilt associated with acting wrongfully might thus constitute a con in the decision-making process.

In addition to Greve et al.'s analyses of why individuals misbehave, three more factors may be emphasized. First, in situations that might be morally clear to experienced practitioners, unexperienced individuals may not in fact know that they are misbehaving. Second, moral situations – for instance novel situations that may appear with new technologies or other previously unknown developments – may be morally ambiguous, even for experienced practitioners. The ethical aspects of the behavior may therefore not have become clear for the agent(s) until after the behavior was deemed as misbehavior. Finally, although it may be clear to the agent that the behavior is morally unacceptable, he or she may nevertheless do so due to weakness of the will (or what Aristotle calls *akrasia*).

There is a vast literature on individual variation in wrongdoing; although, according to Andreoli and Lefkowitz (2008), much of this literature is inconclusive. With regard to age one would think that moral development increases with age, but here the research seems to be inconclusive; some find a link, others not. When it comes to gender, the literature is more coherent that there are no significant gender differences (O'Fallon & Butterfield, 2005). Regarding demographic explanations, there does not seem to exist any significant differences. As to work organizational explanations, a lower position in the organizational hierarchy seems to be correlated with misconduct. However,

there is no relationship between number of years in a business (tenure). Satisfaction with work is negatively correlated with misconduct (Andreoli & Lefkowitz, 2008).

The most theoretically advanced work involves the processes people undertake in the course of misconduct. Much of this research is based on James Rest's (1986; see also Trevino et al., 2006) four-stage model involving (a) awareness that an action has ethical implications, (b) judgment regarding an ethical course of action, (c) development of an intention or motivation to act, and (c) the action itself. The key point is that individuals go through all steps to make a qualified ethical decision, which may involve the decision to behave unethically. It does not mean that individuals must go through all steps to misbehave, a situation in which they may not carry out any ethical decision-making at all.

Rest's model assumes a rational decision-making process. However, there is also research that has questioned that rationality involved. For instance, bounded rationality may hinder people from being aware of ethical situations (Reynolds, 1996). Studies also show how cognitive constraints may lead individuals to overestimate their ethical behavior – i.e. to believe that they have acted or that they will act more ethically than they actually do (Tenbrunsel & Smith-Crowe, 2008). By extension, moral seduction theory holds that selective perception (looking only at certain data), plausible deniability (ability to deny responsibility for relevant others' misconduct), and the fundamental attribution error (attribute own behavior to situation, and others' behavior to personal characteristics) also challenges the rational ethical decision model.

3.2 Organizational level of analysis

We focus in this chapter on the organizational level, i.e. on the organizational conditions for misbehavior. Organizations involve groups of people who have a particular purpose. In general terms, an organizational perspective involves an interest in the structures, processes and practices of these entities, as well as their interface with human behavior. Overall, this perspective views researchers not merely as individuals, but as embedded in their organizational context, as employees and as professionals.

It is not easy to draw a clear line between organizational and individual causes of misbehavior – not least since the characterization of "organizations" as actors are nothing but legal constructions, or that organizational-level phenomena develops from the behavior of individuals or groups. Greve et al (2010: 56) have defined organizational misconduct as "behavior in or by an organization that a social-control agent judges to transgress a line separating right from wrong; where such a line can separate legal, ethical, and socially responsible behavior from their anti-thesis. We define a social-control agent, in turn, as an actor that represents a collectivity and that can impose sanctions on that collectivity's behalf". The actions of individuals and groups are thus always carried out in relation to some set of norms that are themselves defined by specific actors for specific purposes.

One dimension of an organizational perspective on misconduct is an emphasis on collective (or organized) misbehavior. Such misbehavior may involve misbehavior *by* organizations, that is, by groups of people acting in more or less coordinated manners. It may also involve individual misbehavior *on behalf of* organizations, for instance activities that are sanctioned or rewarded by the organization. This dimension is closely linked with the notion of organizational culture, that is, the set of shared assumptions that guide what happens in organizations by defining appropriate behavior for various situations (Schein, 1992).

For instance, Pinto, Leana and Pil (2008) make a distinction between “corrupt organizations” and “organizations of corrupt individuals” – much akin to the common “bad barrels versus bad apples” metaphor. The former points to misbehavior as a top-down phenomenon, i.e. centered on the organization’s upper echelons and influencing the rest of the organization. The latter points to misbehavior as a bottom-up phenomenon located at the periphery of the organization.

Another dimension of an organizational perspective is view of misbehavior not merely as a state of the organization, but as a process. By this is meant the institutional features of organizations, i.e. how certain practices may be or become institutionalized and thus normalized and taken for granted. Notions of power are important here; powerful actors are able to mobilize or foster institutionalization (Powell & DiMaggio, 1991). But institutionalization may also become out of control, or develop so incrementally that it is virtually unperceivable by the participants and/or relevant stakeholders. For research organizations, scientific norms and practices may thus develop and become gradually institutionalized in the organization, or among members of one or several organizations. It may be regarded (although not necessarily explicitly) as the “way we conduct research here”, and thus for various reasons become embedded in organizational routines or cultural practices.

In explaining such dysfunctional processes, some scholars have used the metaphor of a “virus-like infection” of organizations, pointing to the processes whereby misconduct spread among individuals and organizations like a disease (Ashforth, Gioia, Robinson, & Trevino, 2008). Forsberg and Severinsson (Forsberg & Severinsson, 2015) has taken the metaphor one step further, and present a notion of “immune responses” against such infections. In the context of PRINTEGER, the development of integrity may be regarded as one type of immune system against scientific misconduct.

Yet another dimension comes from a critical organizational perspective, were a central question involves ‘Whose definition of misbehavior?’ It offers a view that the line separating misbehavior from legitimate behavior may move from time to time, thus creating uncertainty for organizations and their members. Also, the line may differ between different organizations, or even at different places within organizations.

Palmer (2012: 264) argues that “the position of the line separating right from wrong is a political product, a reflection of the balance of power among competing interests rather than a representation of moral imperative”. This involves an attention to the social processes by which certain ethical standards or discourses come to be dominant in specific organizational contexts and/or at particular points in time, and the effects of these processes on individuals’ interpretations and behavior.

An organizational perspective is important because it contributes to cement *context* into an understanding of organizational misbehavior. It regards ethical decision-making as a located, temporal process, wherein individuals try to create sensible links between formal, and often rather abstract, rules and regulations and concrete actions. It not necessarily straightforward to classify seemingly similar behaviors in different organizations as similar, without a close study of the organizational context. Our assertion, therefore, is that an understanding of research misbehavior implies an acknowledgement of the local organizational context. This perspective is thus different from context-free laboratory experiments of “ethical decisions” and “dilemmas”.

4 Organizational factors contributing to scientific misconduct

Based on a review of the literature on organizational misconduct, there are five contextual factors that may increase the propensity for scientific misconduct. Two of these are at the field level, i.e. they are relatively broad changes that specific research organizations have no or very little impact on, but which nevertheless contribute to the propensity for misconduct: hybridization of science and network collaboration. Three factors are at the organizational level, i.e. they are something that the research organizations to some degree *can* influence: aspiration level, organizational culture and leadership, and governance and control regimes.

4.1 Hybridization of science

One influential institutional change on research practice involves the changing role of universities (Olsen, 2007; Otterlei & Skorstad, 2013). From traditionally operating at an arm's length from the rest of society based on values of academic freedom, higher education and research has gained a much more embedded role in society in the past 20 or 30 years. Accordingly, modern science has itself become more "hybrid", needing to respond to scientific demands as well as commercial, political and other interests.

The hybridity also comes to show as universities are both "machine bureaucracies" as well as "professional bureaucracies" (Mintzberg, 1979). Machine bureaucracies are connected with Weber's bureaucracy, where rules and hierarchy govern much of the behavior in the organization. This is a very efficient organizational form where tasks can be standardized and coordinated centrally. In this organizational form, individuals have limited autonomy. Professional bureaucracies, in contrast, are typical "expert organizations", characterized by flat structures and high professional competence among the employees, who carry out the core tasks.

The hybridity of science not only involves challenges for university administrations, but also for researchers in their (daily) practices. Role and loyalty conflicts may often be present in contemporary research and publication practices. For instance, where should researchers' ultimate loyalty be – at academic virtues of rigorous research, or towards the funding bodies, or perhaps towards their co-workers or management? In a nutshell, increased hybridity in contemporary research blurs social relations of accountability (i.e. who is responsible, and to whom), and increases ambiguity regarding ethical norms.

There is little reason to expect the hybridity to diminish over time. Of course, to some extent there will always be hybridity, simply because of the way we simplify reality into different and distinct analytical categories, that are then applied to describe the very same reality. Nevertheless, as Weber predicted, the more scientific society becomes, the more bureaucratic societal institutions also become. From this one can draw out that increased professionalization of science, i.e. with standards for measuring quantity and quality of research output, increased political control and steering, and increased demands for formal qualifications etc. And further, the more the hybrid tensions between academia and bureaucracy manifests itself.

4.2 Network collaboration

Another institutional change that may function as a contextual factor for misconduct is the increased collaboration between researchers and between researchers and stakeholders. This collaboration

entails social networks, which are are ties between different people irrelevant of formal affiliation. Contemporary academia is in many ways a large social network, consisting among others of researchers being connected in various ways. This creates complexity, for instance as the actors are exposed to different expectations and pressures from different sources.

According to Greve et al. (2010), whereas rational choice, strain and culture provide good explanations for the likelihood that any given organizational participant will engage in misconduct, they do not account for the variation between organizational participants. For instance, many of the examples of collective scientific misbehavior involve people from multiple organizations, presumably with different organizational cultures. In these cases, network theory provide good explanations.

Much like organizational cultures, networks may also cause misconduct (Brass, Butterfield, & Skaggs, 1998). One mechanism is that networks may influence people by providing information of practices (e.g., of how to do things or get away with things) or by socializing newcomers into existing networks. A central reason for this is that networks influence people; hence beliefs, norms and practices spread through networks, for instance as the imitation of legitimate actors. Hence, by extension, researchers are likely to imitate or be influenced by practices by highly legitimate or well-renowned researchers in their network.

Hence, theories of social capital (Granovetter, 2007) and institutionalization (DiMaggio & Powell, 1983) are central in explaining the spread of beliefs and practices across social networks. Both theories imply that researchers who are perceived as good or successful will be emulated. This may not involve copying the actual practices but motivate others to make short cuts to copy the success.

A second mechanism that may be found in networks is the exclusion of others. Some social networks may have specific rules or expectations as to who, or the type of actors, are allowed into the network. Hence, they can be useful for maintaining secrecy, and thus for reproducing misconduct. Classic examples involve mafia business and/or price-fixing conspiracies. This mechanism thus involves much more agency than the first, as it is individuals who design and execute the structure of the network. In a research context, such networks may be designed to conceal specific types of practices.

4.3 Aspiration level

There is little doubt that the market for academic funding and positions has intensified. At the level of the individuals, increased competition is evident in the development of the academic job market, involving more people (e.g. increased number of PhDs) and, relatively speaking, fewer academic positions. A result has been increased temporary employment in academia, and thus also increased status of permanent academic positions relative to the temporary ones. In this context, strain theory (Merton, 1957) suggests that researches will be more tempted to misbehave because of the strong competition for academic positions. The higher the competition, the more likely researchers are to make illegitimate short-cuts.

Studies from the field of misconduct generally find that misconduct is more prevalent in organizations with relatively low or declining profits and suffering from threats to their competitive position (Vaughan, 1999). The theory thus predicts that organizations that face increased competition may be tempted to develop systems for increasing their competitive output – i.e. research in this context. Further, individuals who strongly identify with organizational goals will be

motivated to engage in misconduct. Other individuals may exert voice – for instance through whistleblowing – or leave the organization (Hirschman, 1970).

Strain theory depicts that actors misbehave when they don't have the possibility to achieve their goals through legitimate means. In other words, people and organizations are "forced" to misbehave to obtain their goals – akin for instance to doping or cheating misconduct in sports. Merton (1957) originally formulated the theory to explain why lower social classes where more likely to engage in illegal activities, but the theory is also valuable in explaining organizational misbehavior. In a nutshell, it suggests that organizations and their members are more likely to engage in misconduct whenever resources are scarce, and thus when competition is high.

A challenge with strain theory is, however, that much of the literature has been conducted in the for-profit sector, and that much of it is inconclusive. As a result, it is difficult to explain precisely which kinds of strain that will lead to misconduct – both relatively weak and relatively high performance is linked to misconduct.

Greve et al. (2010) suggest that what they call "managerial aspiration level" may better integrate the conflicting results. In this sense, the key comparison that managers make is not only with peer organizations but also with their own past performance. In organizations where performance is lower than expected, misconduct is likely to occur.

Managerial aspiration level is a potentially useful heuristic to explain the factors that increase the likelihood of research misconduct. Given that academia and research can increasingly be regarded as a competitive field, the expectations of the university management or by the research professionals themselves will be important. For instance, the more a specific research area is prioritized centrally and the more academic prestige is put into this area, the more likely it is that researchers will internalize these ambitions and thus be motivated to misbehave.

We believe that such aspirations are not restricted to the managerial level, and that aspirations can also explain the behavior of individual researchers. Such aspirations may involve forms of "academic stardom", or recognition by specific stakeholders. Given that most researchers have a considerable degree of freedom and autonomy in their work, they can act in accordance with their aspirations, for instance in terms of the research that is conducted, the people or institutions that are collaborated with, or the funding that is sought. Although we have not found any empirical studies of this, an inference from the above studies would suggest that high individual aspirations is likely to increase the risk of them being tempted into misconduct. This risk may also be connected with the amount or type of financial rewards, or public attention, and the level of competition in the professional milieu. The higher the perceived rewards, the higher the risk of misconduct.

4.4 Organizational culture and leadership

Sociological theories of organizational misbehavior place great emphasis on the role of culture (Schein, 1992). Culture involves shared assumptions about norms, values and beliefs about appropriate behavior. What is considered appropriate is always context specific; hence, some cultures may condemn certain behavior as misconduct, whereas other cultures may regard it as normal. As we know from organizational theory, organizations consist of cultures (and sub-cultures), both formal and informal, and which provide a framework of behavior for the employees.

What is crucial is that organizational culture can under certain conditions generate and/or permit misconduct. Enron is the classic example, where the so-called "Enron-culture" conveyed acceptance and even accentuated risk-taking and rule-breaking behavior of its employees (Vaughan 1999). Regarding scientific misconduct, most cases point to individuals engaging in misconduct, and less often to several individuals being involved. But this does not mean that the culture of research misconduct is less important. As an example of the latter, the case of the South Korean professor Hwang also involved several other of his coauthors. Furthermore, in the case of Sudbø and others, questions were asked about why the co-authors where not dismissed. From a cultural perspective, these cases illustrate that collective practices of scientific misconduct may exist and develop, perhaps most often as tacit acceptance of practices that are of mutual benefit to the group.

Cultures of misconduct may also develop in less agentic ways. Ashforth and Anand (2003) have described three interrelated processes that are central in developing and reproducing cultures of misconduct. First, institutionalization involves the development of formal structures and even routines that serve to facilitate misconduct, such as rewards and sanctions. Second, socialization involves the processes through which newcomers are included in the culture, among others by creating some kind of shared social identity that separates the group from others. Third, by mobilizing rationalizing arguments or discourses, i.e. which help to construct senses of the misconduct as legitimate behavior.

As to the latter, a classic framework was developed in sociology by Sykes og Matza (1957), who studied how juvenile delinquents justified their misconduct. The authors list five "techniques of neutralization": Denial of responsibility, denial of injury, denial of victim, condemnation of the condemners (i.e. attacking the concerned party), and appeal to higher loyalties (i.e. a higher moral cause). Arguably, such neutralizing devices are important for researchers in legitimizing their misconduct – for others as well as for themselves. For instance, they may argue that in plagiarizing others' work there are no specific victims, or in falsifying data that the results will lead to more funding and consequently to better overall research.

A related explanation can be found in what Vaughan (1999) calls the "normalization of deviance". By this is meant the gradual process by which technological and organizational systems become faulty – each mistake represents only a small deviation from intended behavior, yet the result over time is that more serious deviations may become normalized and routinized (Starbuck and Milliken 1988). In terms of peer-review, similar deviations from an "intended" review – i.e. from what we may call a good review – are for the most part not sanctioned in any way. Hence, "insufficient" reviews may persist and even escalate, where researchers learn to conduct insufficient reviews – which evidently will not identify scientific misbehavior.

Organizational culture can also play an important *indirect* role. By this is meant that certain cultures may give rise to other conditions that in turn facilitate misconduct. For instance, certain research cultures may develop that are highly competitive, and which place great merit on extraordinary performances.

According to the literature, leader behavior is a central condition for the development of organizational culture. Sims and Brinkmann (2003) have listed five dimensions of leader behavior which accentuates a culture of misconduct: What leaders pay attention to, the ways in which they respond to crises, the behaviors they model, the behaviors they reward and punish, and the kinds of

employees they hire and dismiss. Leaders may often – explicitly or not – authorize misconduct – for instance by creating rules and systems for misconduct, or by (tacitly) accepting illegitimate practices.

More broadly, leaders serve by virtue of their power position as role models, and as we know from for instance the famous Milgram experiments, have great influence over their subordinates' behavior – even though the expected behavior contrasts with the subordinates' ethical values.

4.5 Governance and control

Another central organizational condition is systems of measurement and control. At the most basic level, measurement and control are organizations' tools for making their members behave in a desired way. In this sense, employee behavior is manipulated through rewards and sanctions in accordance with a pre-defined set of criteria. This way of thinking has among others been coined 'management by objectives', and is heavily debated especially in studies of public sector management. Broadly, it is rooted in questions of how to increase productivity while the welfare of the employees is safeguarded.

While measurement and control systems are often viable organizational means, there is also a risk that they may facilitate or trigger unwanted behavior. For instance, Sims and Brinkmann (2003) explain how Enron developed a ranking system when evaluating employees. This created increased pressure on the performance of employees relative to their peers, and led to an increased proliferation of dubious activities in the organization. Overall, a central risk of measurement systems is that the measured actors will try to manipulate the measurement outcomes in their favor – i.e. that the means become the new end.

In academia, there has also been an increased emphasis on counting and comparing productivity – i.e. academic output. It is not easy to measure academic output, but a common way of doing so is by examining academic publications. This is done both on the level of individuals – e.g. when applying for an academic position – and organizations – i.e. university rankings. However, despite the usefulness of looking at publications to reduce the complexity of academic output, there is the risk of manipulation. Such manipulation may involve "salami slicing", i.e. increasing number of publications from the same dataset. Whereas "salami slicing" may be described as a grey area practice, manipulation may of course also involve more distinct misbehaviors such as fabrication, falsification or plagiarism.

Such measurement systems may also facilitate cultural development in unwanted ways, for instance, if rewards connected with the manipulation are high and if the likelihood of being sanctioned is low. Gains, for instance, may involve a culture of favoring individual academic accomplishments – for instance through high performance based salaries, high competition for funding and resources, extensive support and reinforcement of "academic superstars", and a management that rewards (short-term) results. Overall, such examples are likely to create an academic culture that favors scientific ends over its means – in other words, where results are more important than the methods.

It is important to note that control systems are linked with unintentionality and thus with unintended consequences. For instance, a central assumption in the literature on accidents is that even well-designed organizational systems and technologies may fail. Charles Perrow (1984) termed this "normal accidents". Although Perrow argues that accidents and misbehavior are mutually exclusive

because accidents by definition are unintentional, the causes of the accidents may still be the result of misconduct.

In this view, research misconduct is the result of failed control systems. One such control system is peer-review. The peer-review process is a central academic institution, and it has different functions, such as evaluation of academic papers, evaluation for project funding, or evaluation for academic positions. It also (ideally) involves different social and technological features designed to detect fabrication, falsification and plagiarism. Seemingly all the main scandals involving research misconduct have involved failures in the peer-review system, where the misconduct has not been detected.

Accident theory suggests that accidents may happen because organizational structures are (often) designed to economize on routinization and specialization. As to the former, the sheer number of articles being submitted to journals has placed increased pressure on the peer-review system, and on peer-reviewers in particular. Often review has to be done under time constraints – and combined with relatively extensive reviewing, this may lead to what Daniel Kahneman and his colleagues have termed “system 1”-thinking, i.e. that more automated cognitive processes are in play when reviewing, instead of “system 2”-thinking involving more in-depth and reflective cognitive processes (Kahneman, 2012). Accordingly, contemporary reviewing has made it more difficult for reviewers to spend sufficient energy and resources to be able to spot instances of misconduct. Moreover, academia is also characterized by increased thematic specialization, where expertize often involves more depth and less breadth – both theoretically and methodologically. Hence, as a result, it may become increasingly difficult for editors to find appropriate expertise to conduct proper reviews that will identify misconduct.

Related to the issue of governance and control is that of agency relations and opportunistic behavior within these. Most examples of scientific misconduct involve primarily misconduct by employees against the organization – i.e. that the misconduct is carried out by one or more individuals in their own interest, and where the organization is one of the aggrieved parties. The misbehavior is thus the outcome of dysfunction between the employee/researcher (the agent) and the research organization (the principal). The dysfunction emerges as the principal cannot control all the actions by the agent (information asymmetry) (Eisenhardt, 1989).

A key problem of information asymmetry (“moral hazard”) occurs when activities that are useful to the principal are costly for the agent – such as proper research conduct. It is time consuming and potentially very tedious work for the researchers. Because of information asymmetry, i.e. that others in the research organization cannot easily see the actual work or the results of it, researchers may be triggered to make short cuts. Were the principals to increase their information – for instance about the interpretation of data – the agency problem would be reduced. At the same time, increasing information is costly for the principal as it might have to increase the use of direct monitoring of the empirical and analytical processes, not only the results (as in peer-review).

The costs of increasing information is central for organizations as they seek to control their members to act according to the organizational interests. Rational action models assume that it is too costly for organizations to gain full information, and that some kind of equilibrium of “optimal misconduct” is most rational – in others words, from this perspective, a certain level of misconduct has< to be accepted within any organization.

Rational choice theory and the agency problem not only involves individual behavior, but also that of organizations. Although most examples of scientific misconduct involve single researchers or groups of researchers, it is also an important issue at the level of the organization. Academic prestige is an important capital for research institutions, and they are thus – from the rational choice perspective – likely to make similar weightings of such benefits against the likelihood that misconduct is detected. For instance, in the recent case of Paolo Macchiarini at Karolinska University in Sweden, his misconduct was denied on several occasions by the University principal, presumably on the basis that the cost of admitting the (alleged) misconduct and damaging the university's reputation was greater than gains. This, however, evidently led the principal to resign.

4.6 Some conclusions for the further study of scientific misconduct

In this section, we have elucidated what we believe are some central contributing factors for research misconduct at the organizational level of analysis. We have approached the term rather broadly, and not defined it as for instance fabrication, falsification and/or plagiarism, in order to identify and discuss some of the most central factors that influence the likelihood that individual researchers and research organizations engage in scientific misconduct.

In order to operationalize these relatively general and theoretical points into a research agenda for PRINTEGER, we have outlined a number of research questions (see table 1). These questions are relevant for a deeper understanding of research misconduct, and they are inferred from the literature review above. Our idea is that these questions can operate as a basis or starting point for the development of the research design in the project.

Contextual factors for misbehavior	**Functional mechanism**	**Research questions for PRINTEGER**
Institutional factors		
Hybridization of science	Increased institutional complexity, i.e. differing stakeholder demands. Blurring of boundaries between academic virtues and commercial interests.	To what extent are the objectives of researchers and research institutions conflicting between academic and commercial interests? How do researchers and research institutions respond to these different interests?
Network collaboration	Normative influence, i.e. spread of deviant practices Blurring of accountability relations.	To what extent are researchers and research institutions influenced or pressured by practices in their network collaborations? How do they deal with such influences or pressures? What are the differences between research misconduct in networks of people from different organizations and research misconduct by a group within an organization?

Organizational factors		
Aspiration levels	The aspirations of researchers and/or research institutions to succeed in competitive environments.	What are the aspirations of research managers, research institutions, and individual researchers? How do aspirations correspond with the availability of resources (i.e. are they sane or over-ambitious?) How do researchers and research managers interpret and respond to productivity demands from their superiors?
Organizational culture and leadership	Institutionalization or normalization of misconduct, i.e. as a gradual decay of standards. Normative influence of colleagues and managers.	How do academic cultures differ with regards to how they perceive and sanction misconduct? How do researchers and research managers make sense of "grey zone" research activities? What is the role of research leadership in developing ethical research practices and sanctioning misconduct?
Governance and control regimes	Opportunism and "moral hazard" i.e. ways to "curve" the system. Unintended consequences and accidents.	How do research institutions prevent research misconduct? What are the formal and informal control and whistleblowing systems in place? How are these regarded by the researchers?

Table 1: Contextual factors that might contribute to misconduct, and operationalization of research questions related to the factors.

5 Scientific misconduct and organizational integrity

In this chapter, we want to discuss not only research misconduct itself, but also how it affects research organizations. In the following section, we first describe organizational responses to research misconduct as instances of damaged integrity and/or legitimacy. We then elaborate on different types of response that research organizations may undertake. Finally, on the basis of the previous discussions, we describe a concept of "organizational integrity work" as a potentially useful heuristic for exploring the processes through which research organizations respond to misconduct and repair their integrity.

5.1 Organizational integrity and legitimacy

Misconduct can be understood as the result of a lack of integrity. Research integrity has been defined as "the trustworthiness of research due to the soundness of its methods and the honesty and accuracy of its presentation" (Office for Research Ethics and Integrity)[1]. Broader definitions involve "principled behavior", which may be subject to various interpretations (see also section 2). For

[1] http://orei.unimelb.edu.au/content/definition

instance drawing on a objectivist ontology, Becker (1998) understands integrity as "the principle of being principled, practicing what one preaches regardless of emotional or social pressure, and not allowing any irrational consideration to overwhelm one's rational convictions" (1998: 157).

Organizational integrity in turn "refers to the ethical integrity of the individual actors, the ethical quality of their interaction as well as that of the dominating norms, activities, decision making procedures and results within a given organization" (Palazzo, 2007). Organizational integrity is more than the result of the integrity of its members – it is embedded in the very modes of organizing and practicing research. A general conception is that organizations that have integrity have less risk of developing practices or cultures of misconduct than organizations that do not have integrity.[2]

According to Becker, a lack of integrity has three characteristics. First, there is a lack of principles, i.e. researchers or research organizations do not have any articulated moral convictions about what ethical research is. Second, there is inconsistency in moral principles, i.e. convictions about ethical research may change according to different situations, such as in relation to different funders or in processes of publishing research. Third, and most relevant for our purposes, behavior is (easily) influenced by social pressures, for instance the difficult situation of the job market. Ultimately, therefore, a lack of integrity involves research that is not founded in overarching principles and which is thus carried out with other intentions and motivations.

Integrity may also be understood as resistance against moral temptations. According to Kidder (1995), moral temptations involve a decision between right and wrong that is based clearly on the core values possessed by each individual. The "wrong" course of action represents a temptation, as in the case of making academic shortcuts. There will for most academics be plenty of temptations to misbehave, and integrity thus involves resistance to these temptations.

If social forces make individuals or organizations' make behave in ways that are not consonant with their principles, there is a lack of integrity. An example here from the research field may be generating, removing, or over/under-emphasizing findings in favor of specific funders. Hence, organizations need to be aware of the social and institutional forces they are pressured by, and reflect on how they inform the actual research practices. At the most basic level, they need to have an understanding of what kinds of practices they need to conduct in order to have integrity.

What is important for PRINTEGER is also that integrity can, from a social constructionist perspective, be regarded as "images" of specific organizations – i.e. not founded in any objective criteria or virtues, but an image to be constructed and reconstructed according to specific interests or ideas. Research organizations – like other knowledge providers – are highly dependent on a favorable image, not least given the ambiguous nature of their product (Alvesson, 2001). This image may be developed through specific rhetorical strategies on integrity.

For research organizations, integrity can therefore be perceived as a form – if not the most essential form – of legitimacy, i.e. "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995: 574). Legitimacy is central to understanding how organizations are motivated to respond to cases of misconduct, since it is vital for organizations to obtain societal

[2] Honesty is for instance a virtue that is often seen in connection with integrity; Butler and Cantrell (1984), for instance, define integrity as the reputation for truthfulness and honesty of the trusted person.

support and resources. Ultimately, integrity – like legitimacy – is not something that research organizations *have*, but a result of how various stakeholders *perceive* them.[3]

A central implication of scientific misconduct is therefore that it operates as *legitimacy threats* to research organizations, in which key stakeholders question the integrity of the research that is conducted. This triggers the need for the organizations to restore the legitimacy, an issue we turn to next.

5.2 Restoring threatened legitimacy

The literature on organizational legitimacy suggests that when organizations experience a legitimacy threat, they can respond in one of two ways.

One response strategy is to engage in "protection responses", that is, to craft responses that are directed toward the source of the threat. Such responses are intended to question the bases of the legitimacy threat, and thus to avoid changes to the organization. Arguably, a key portion of such responses is discursive, and involves creating or re-creating the threatened images or discourses of the organization. This is a central feature of the literature on crisis communication, holding that – to a certain extent – organizations can communicate themselves out of trouble. For instance, Benoit (1995) has developed a typology of some common response strategies: denial, evasion of responsibility, reducing offensiveness of event, plan for corrective action, and apology as the central restoration strategies (see table 2).

	Strategy	**Key characteristic**
Denial	Simple denial	Did not perform act
	Shift the blame	Act performed by another
Evasion of responsibility	Provocation	Responded to act of another
	Defeasibility	Lack of information of ability
	Accident	Act was a mishap
	Good intentions	Meant well in act
Reducing offensiveness of event	Bolstering	Stress good traits
	Minimization	Act not serious
	Differentiation	Act less offensive
	Transcendence	More important considerations
	Attack accuser	Reduce credibility of accuser
	Compensation	Reimburse victim
Corrective action		Plan to solve or prevent problem
Mortification		Apologize for act

Table 2: Organizational protection responses to misconduct

[3] This renders legitimacy different from for instance reputation.

A second option for organizations is to undertake "restructuring" responses, in which distinct organizational changes are made in correspondence with the legitimacy threats. For instance, a common strategy is to assign responsibility and to remove or punish the "bad apples" that have misconducted. It may also involve the design of strategies regarding how the research organization may engage more systemically with the misconduct, for instance in terms of more significant organizational or policy changes. Such responses are thus not mostly discursive, as in the case of the "protection" responses, but involve more substantial efforts to repair the damaged or threatened integrity.

We believe that both the "protection" and the "restructuring" responses are fruitful area of interests in order to understand how research organizations respond to scientific misconduct. A broad question involving both the areas is whether there is any relations between them in the responses by research organizations, i.e. that the discursive responses are combined with substantial corrective efforts. In cases where there are few relations between the discourse and the substance aspects of responses to misconduct may been coined as "hypocritical" (Brunsson, 2003). In contrast, one may argue that organizations that respond with sincere efforts to do something about it illustrate traits of integrity.

It is thus important to understand both the discursive and the substantial aspects of responses to scientific misconduct, and in particular what kind of repair "work" that is undertaken in research organizations. We will explore such work below.

5.3 Organizational integrity work

So far, a central assumption is that organizational integrity is something that can be managed – for instance through education, leadership, and accountability (Paine, 1994). In the words of Becker, organizational integrity is not a matter of words alone, it requires action. To this we might add that it requires not only action, but *ongoing* action. How organizations work with their integrity and legitimacy is thus not only something that can be narrowed down to specific efforts, but something that is embedded in routines and practices, and thus part of everyday organizational life.

From an organizational perspective, it is precisely this ongoing and processual work that is theoretically and practically interesting. This enables us to move our understanding beyond only the restoration of legitimacy/integrity, and towards the work undertaken to prevent it from happening in the future.

To capture these dimensions, we think that a concept of "integrity work" is useful. It can operate in many forms and be carried out by different people with different intentions, but overall, it can be described as the ongoing organizational activities and strategies associated with developing, repairing and/or maintaining integrity.

Examples of such work may be education programs, distinct managerial attention to and prioritization of integrity, discussions and reflections on integrity and how to strengthen it, development of control or monitoring systems, and development and/or formalization of rules of conduct. One aspect of these is *what* is actually developed, i.e. the type of leadership or the actual rules of conduct. Another aspect is *how* they are implemented and received by the members of the organization. The former is more directed towards a normative analysis of intentions, and the latter is more directed towards practical-evaluative analysis. We will try to capture both these aspects in the subsequent empirical work in PRINTEGER.

Two characteristics are central to integrity work, and make it stand out from other ways of conceptualizing the relationship between integrity and misconduct. First, rather than talking about integrity as a relatively static trait of organizations (i.e. low or high), it suggests that integrity is always constructed in and through practices and it thus situational and context-dependent, and related to the institutional conditions of the focal organization. It points to the *application* of ethical principles, akin to what Clegg, Kornberger and Rhodes (2007) have coined "ethics-as-practice". The concept of integrity work thus provides a more dynamic and context-specific view on integrity than more objectivist views.

Second, there will always be some kind of integrity work going on in most organizations, presumably. However, integrity work is likely to be activated and intensified when the organization's integrity is put under pressure. Examples of such pressures may be heightened managerial aspirations levels regarding research output, or public allegations (or scandal) of misconduct. An important feature in the context of research misconduct is therefore that it provides an analytical lens for studying and conceptualizing the various responses that individual and organizations make when faced with different integrity-threatening challenges.

Paine (1994) has argued convincingly that integrity can be managed – "an integrity strategy is characterized by a conception of ethics as a driving force of an enterprise. Ethical values shape the search for opportunities, the design of organizational systems, and the decision-making process used by individuals and groups. […] Above all, organizational ethics is seen as the work of management" (1994: 111). On one hand, compliance programs involve a focus on preventing misconduct; on the other hand, an "integrity strategy" involves a focus on the enabling of responsible conduct.

However, unlike Paine (1994) we focus not only on the "management" or "strategizing" of integrity repair, and something primarily located at the upper echelons of the organizations, but also on the more mundane "doing" of integrity repair and strengthening by all relevant members of the organization. We are interested in how misconduct is interpreted by the organization, and how these interpretations lead to different kinds of repair or strengthening "work" in the organization.

For instance, misconduct may mean different things to different organizations, or different actors in the organization. These different interpretations are first and foremost an empirical question. However, one could expect that one variation would be between the research management and the researchers. Most managements would likely take cases of misconduct very seriously, and undertake a range of measures to prevent it. However, we would expect a greater variation in how these repair initiatives are interpreted by members of the organization.

5.4 Dimensions of integrity work

There are various ways of conceptualizing dimensions of integrity work. Integrity work may for instance involve reconstructions of organizational or professional identity (who am I as a researcher?, what is my conception of the research organization that I am working in?). It may also involve ethical reflections, both on the organizational and individual level (what kind of research do I/we want to carry out?, which standards are sufficient or appropriate for my/our work?).

More broadly, however, integrity work involves influencing behavior. A useful and broad starting point to capture such influences is Scott's (1995) 'pillars of institutions' – regulative, normative and cognitive. These depict the various institutional elements that influence organizational behavior. This work draws in part on his earlier work on organizations as rational, natural and open systems

(1981), but focuses more explicitly on how organizations relate to and are influenced by institutional pressures, i.e. as open systems.

The regulative pillar depicts the integrity work that first and foremost is rooted in rules and sanctions – hence research misconduct can be regarded as a lack of (explicit) rules or sanctions, or the wrong kinds of rules and sanctions. In this pillar, integrity work is manifested in protocols, standards, and procedures. The mechanisms that are in play are primarily coercive, that is, they are based on more or less formal mandates and lines of control and accountability. From this perspective, integrity-based behavior is influenced on the basis of expedience or utility – people act on the basis of integrity because they are sanctioned if they do not, and perhaps rewarded if they do.

The normative pillar depicts the prescriptive and evaluative aspects of behavior, i.e. as rooted in specific values and norms. In this view, misconduct is the result of certain conceptions about how research should be conducted – for instance rooted in certain rules of conduct in organizations or scientific fields more broadly. Integrity is thus first and foremost a matter of social obligation, that is, it is not steered through legal sanctions but through moral ideas and convictions. Here, ethical guidelines and codes of conduct represent some tools that management may use to clarify or develop the ethical principles surrounding research and research practices.

The cognitive pillar depicts how people make sense of stimuli through actual practices, i.e. how rules, norms etc. are implemented and thus the actual role they play in the actual research that is carried out in the organization. In this view, misconduct may be the result of orthodoxy or normalization, for instance escalating from grey zone to more outright instances of misconduct. It could involve forms of legitimation, in which problematic practices are justified by references to different institutional bases of legitimacy. Such legitimation may be mobilized through different rhetorical strategies, such as authorization (e.g.”my boss told me to do it”), normalization (e.g. “everyone does it”), rationalization (e.g. “it gives me/us resources”), moralization (“it is proper conduct”) and narrativization (e.g. “I’m an underpaid female researcher, and I have to do it to progress in my career) (Vaara & Tienari, 2008; Van Leeuwen, 2007). Conversely, integrity is in this pillar developed through, for instance, legitimation and other types of cultural work, i.e. to develop a culture of integrity and integrity-based research.

Many mechanisms are at work in the intersection of these three pillars, and organizational institutionalism describes the dynamics between regulative, normative and cognitive/cultural in ways that shed light on some of the problems and opportunities in designing effective integrity programs. One way of capturing the intersections between the pillars is to examine integrity work as a particular type of institutional change. Institutional change involves changing accepted and taken-for-granted practices, for instance practices associated with conducting or reporting research. This kind of institutional change does not involve changing macro-level institutions, but rather operates on the micro level, and revolving around research as a set of (daily) practices.

This kind of micro-level change is not mundane – for instance, change efforts often invoke a certain degree of resistance or skepticism among the subjects of the change. From the point of view of steering or managing the change efforts, the challenge is to have lower level organizational units or individual researchers conducting their “own” integrity work that corresponds with the overall intentions.

Hence, it is possible to talk about different types of work undertaken to change institutions (Lawrence & Suddaby, 2006): One is through the creation of new institutions that correspond with new demands, for instance developing new research practices, new arenas for discussion, or new accountability or governances practices. Another is disrupting old institutions, for instance removing standards for research practices that have been coined as unethical. A third type of institutional change is maintaining existing institutions, for instance keeping legitimate research practices.

The different change efforts may be undertaken simultaneously, and a possible fruitful analysis is to examine them in relation to the three above-mentioned pillars of institutions. In this way we are able to explore also in more detail the processual dimension of integrity work. In the subsequent work in the PRINTEGER project, recommendations for practical integrity work will be based on this conceptual framework of institutional analysis, findings from the empirical work in the project, and stakeholder dialogue.

5.5 Some conclusions for the further study of organizational integrity work

The notion of organizational integrity work may hopefully be of some use with regards to research misconduct and integrity. There has been done considerable research on the amount of research misconduct, but we still know little of how research organizations work – on a more or less daily basis – with strengthening their integrity, or how they respond to cases of misconduct and thus seek to repair the integrity.

We have in this chapter drawn mostly on an institutional perspective, using Scotts (1995) “pillars of institutions” as a point of departure in operationalizing research questions for the empirical studies in PRINTEGER. As noted above, emphasis will also be made to explore relationships between the three pillars, including how their influence may change over time, as well as how different actors work to create, maintain and/or disrupt institutional practices, during the course of developing research integrity.

This focus allows us outline a research program with the following structure (table 2):

	Focus of study	Drivers for research integrity	Research questions for the organisational research
Regulative pillar	Mandates, legislative frameworks, governance systems, protocols, standards.	Policy and policy development that includes integrity as a core element of the mandate of research organisations. Organizational governance and control systems that identify and sanction misconduct.	What is the content of integrity policies, and how do policies impact researchers and their practice? What is the support, interpretation and translation of integrity policies in research organisations?
Normative pillar	Values, expectations, authority systems, conformity, pressures from key	Pressure from the media, politicians, professional associations, and other stakeholders.	How do researchers and research institutions adhere to (different) expectations of

	stakeholders (owners, the public, etc.)	Formal evaluation criteria adapted to integrity goals. Professional values and perceptions of duty among researchers.	research integrity from their stakeholders?
Cognitive pillar	Culture, pedagogy, legitimation and learning, reward systems, focus on management.	Organizational "moral development", i.e. reflection about research integrity. Best cases, in which organizations adapt or copy other integrity practices.	What does research integrity mean in practice for researchers and research institutions? How do research organizations seek to increase their integrity? When, where and why do questions of research integrity become salient?

Table 2. A matrix for organizational integrity work

6 Conclusions and final remarks

In this chapter, we have had three objectives: identify organizational factors that contribute to misconduct, discuss research integrity from an organizational point of view, and sketch out a research agenda for organizational studies of research misconduct and integrity. A central motivation in writing the chapter has been an acknowledgement that most descriptions of scientific misconduct – both in academia and in popular writings – are predominantly based on assumptions of individual causes of scientific misconduct, i.e. that they are carried out in a deliberate fashion by researchers acting deliberately in their own self-interest. We have attempt to nuance these assumptions by adding a set of organizational and institutional factors, based on the literature on organizational misconduct and organizational institutionalism. On the basis of our analytical exercise, we have formulated distinct research questions to be explored further during the course of the PRINTEGER project.

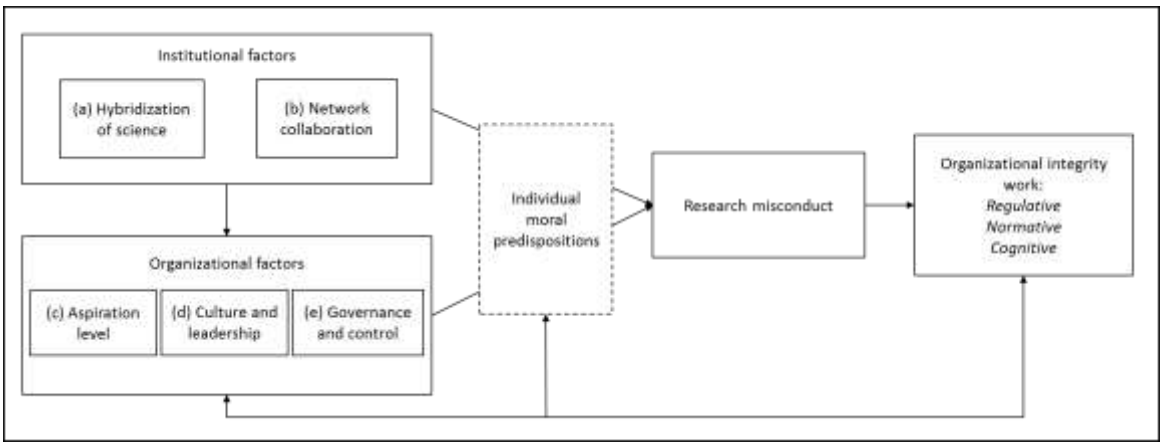

Figure 1: An overview of organizational factors to research misconduct and subsequent integrity work.

We have in our discussion tried to develop the concept of "organizational integrity work" as a potentially fruitful concept for understanding the mechanisms of research misconduct as well as a program for how research organizations and other institutional actors can work with integrity more broadly. We have tried to summarize our argumentation in figure 1, where research misconduct is presented as a result of individual and organizational factors, leading to a need for integrity work. However, organizational integrity work may (and will ideally) be initiated in a preemptive manner, as a way to avoid potential cases of misconduct.

It must be emphasized that these arguments are mainly theoretical, and that they need to be explored and nuanced based on empirical inquiry. We suspect that hybridization, network collaboration, high aspirations, dysfunctional cultures and leadership, and lack of governance and control mechanisms all play some part in explaining research misconduct. However, we know little of how they play out in practice, in different research contexts, and at different points in time. Also individual moral dispositions, depicted here in a stapled line, certainly play an important role, but to date this role, and in particular how it plays out in practice within an organizational setting, is underexplored.

These organizational issues will be addressed in the subsequent empirical work in the PRINTEGER project (case studies, focus groups and survey) and will be the basis for recommendations for practical organizational integrity work.

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