Promoting Integrity as an Integral Dimension of Excellence in Research

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Research protocol

DOCUMENT DESCRIPTION

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Table of Contents

1 Introduction

Work package 4 concerns how researchers experience integrity and how integrity can be understood from a work floor perspective. The work in this work package provides important input to the work on tool development in work package 5. In this protocol we therefore focus on research concerning the work floor perspective. The PRINTEGER project also takes different perspectives (e.g. legal perspectives). These are not addressed here.

In the PRINTEGER project description the content in task IV.1 (Research protocol) is articulation of (a) questions to be addressed through the web-based questionnaire, (b) issues and questions to be addressed in focus groups, and (c) target groups, including gender balance, national spread, inclusion of industrial researchers, etc. The overall aim of the research protocol is to ensure complementarity across the different methods used in the PRINTEGER project.

In the following, we provide a research protocol for the survey and some basic perspectives for the focus groups. The PRINTEGER team at the University of Bristol has also made a full protocol for the focus groups, that is accessible on the PRINTEGER website. We also include our input for the case study protocol (D III.3), which in turn provides a basis for the upcoming work in task III.6 where we will identify and analyse organizational best practices. The full protocol for this study is also available on the website. In this deliverable we will not repeat information (for instance about specific sampling strategies or the procedures for analyzing the material) from the focus group and case study protocols. However, more detail will be provided on the survey, as this is not reported elsewhere.

Before turning to the methods, we briefly sketch the link between the methods and the theoretical concepts developed in D II.6.

2 Analytical perspectives on scientific misconduct and integrity from Work Package 2

This research protocol draws on the theoretical and methodological underpinnings and assumptions outlined in deliverable II.6. In this document we have (a) elucidated central organizational causes and conditions for scientific misconduct, (b) discussed the topic of research integrity from an organizational perpective, and (c) sketched out a research agenda for studies of research misconduct and integrity.

The third element is particularly relevant for the reseach protocol, and we build on this in order to be as specific as possible about the link between the research activities and the underlying theoretical assumptions regarding the studies of misconduct and organizational integrity work, respectively.

2.1 Study of organizational causes and conditions for scientific misconduct

In deliverable II.6, we identified and discussed five organizational causes of scientific misconduct – which may also be described as risk factors for scientific integrity. These are hybridization of science, network collaboration, aspiration levels, organizational culture and leadership, and governance and

control regimes. The different methods in the PRINTEGER project will highlight different aspects of these risk factors, as shown in table 1.

Contextual factors for misbehavior	**Functional mechanism**	**Research questions for PRINTEGER**	**Method used in 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?	Focus groups; survey Focus groups
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?	Focus groups; survey Focus groups Case studies
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	Survey, focus groups Survey; focus groups Survey, focus groups

		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 regard 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?	Survey, focus groups Focus groups Case studies; focus groups
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?	Focus groups; survey; case studies Survey; focus groups

Tabl1 1: Risk factors and methods to address them.

2.2 Study of organizational integrity work

In discussing the concept of organizational integrity work, we adopted an institutional perspective and elaborated on Scott's (1995) three pillars of institutions: regulative, normative, and cognitive. We think the institutional framework is especially useful in the qualitative studies since it deals with research (and research management) practices, although some features are also relevant for the content in the questionnaire.

The different methods in the PRINTEGER project will highlight different aspects of these pillars, as shown in table 2.

	Focus of study	**Drivers for research integrity**	**Research questions for the organisational research**	**Method to be used in PRINTEGER**
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	What is the content of integrity policies? How do policies impact researchers and their practice? What is the support, interpretation and translation of integrity policies in	Focus groups, survey Focus groups Survey, focus groups

		identify and sanction misconduct.	research organisations?	
Normative pillar	Values, expectations, authority systems, conformity, pressures from key stakeholders (owners, the public, etc.)	Pressure from the media, politicians, professional associations, and other stakeholders. Formal evaluation criteria adapted to integrity goals. Professional values and perceptions of duty among researchers.	How do researchers and research institutions adhere to (different) expectations of research integrity from their stakeholders?	Focus groups, survey
Cognitive pillar	Culture, pedagogy, legitimation and learning, reward systems, focus on management.	Organizational "moral development", i.e. reflection about research integrity. 'Best practice' focus, 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?	Survey, focus groups Focus groups, case studies Focus groups; case studies

Table 2: Pillars of integrity work and methods to address them.

2.3 Implications for the survey, the focus groups and the case studies

Based on the analysis summarised in tables 1 and 2 we will now describe in more detail how this translates into protocol elements in the survey, focus groups and case studies. Also other elements have been of relevance in the development of the focus group and case study protocols, so the resulting protocols are not identical to what is described here.

3 Protocol for web survey

3.1 Background

In the PRINTEGER project proposal the following is written:

"The project will perform a web-based Questback survey among European scientists in order to create an inventory of the most urgent challenges and options for strengthening integrity, mapping the main concerns and options for manoeuvre brought forwards by respondents, to be used as input for the subsequent steps in our project. On the one hand, the focus of the survey will be on integrity. What

options do researchers and research leaders see to enhance integrity and allow integrity to become more visible as a key component of good and responsible science? On the other hand, the focus will be on misconduct. Respondents will be asked about their own first and second hand acquaintance with various forms of misconduct or fraud in science, similar to victim surveys in criminology, about compounding factors in misconduct, such as increased performance pressures for scientists, perceived competitiveness, or similar systemic pressure experienced by researchers. In addition, the survey will ask researchers what they think of current initiatives, such as reporting procedures or codes of conduct, and what they see as the most effective ways to address misconduct or promote research integrity.

We will recruit respondents among the faculty members of the eight partner organisations by using the so-called snowball method, i.e. by sending e-mails first to leaders who subsequently will forward the information about the survey and the link to the Questback to their employees. In order to study the independent effects of background variables such as age, sex, length and type of education, seniority, type of university and research funding we will recruit a minimum of 300 researchers and research leaders from each university, giving us a sample of around 2400 respondents from eight European countries."

Gaining this knowledge will not only give us important empirical knowledge that may inform the different theoretical approaches and perspectives on research misconduct and integrity outlined in deliverable II.6, it will help us in PRINTEGER to outline adequate and well-targeted actions and recommendations. The research questions outlined above will guide the analyses of the survey results.

The HiOA project team reveiewed existing surveys in this field and developed a complete draft for the survey. The preliminary work was discussed at three PRINTEGER consortium meetings (September 2015, March 2016 and August 2016) in order to make sure that the consortium has had the chance to give its input. The survey was also discussed with Lex Bouter and Matthias Kaiser, in the PRINTEGER advisory board, whom have been responsible for several similar surveys earlier (and presently).

Here we will present the structure of the websurvey and some key methodological issues. The questionnaire and information to participants are attached in appendices 1 and 2.

It should be noted that a parallel survey (using an adapted version of the questionnaire) will be conducted in major R&D intensive corporations in the European Food and Drink sector, in cooperation with FoodDrink Europe. However, this is not a contractual deliverable in the PRINTEGER project and will not be presented here.

3.2 The structure of the websurvey

The survey consists of the following structure:

Organisational policies, whistleblowing, work environment, tenstions and risks, research quality, integrity measures, prevalence of scientific misconduct, and background questions.

Please see appendix 1 for all survey questions.

3.3 Key methodological issues

During the development and consultation process internally in the project, the following topics were addressed.

3.3.1 Is there a need for prevalence data?

From our literature analysis it is clear that there is a need for prevalence data. The data we will gather are unique in the following respects:

- It is from a wide variety of disciplines, while many previous studies have been from the biomedical domain.
- It is from a cross-section of European countries. Many current studies are national (and many from the US). Science Europe Briefing paper *Research Integrity: What it Means, Why it Is Important and How we Might Protect it,* Dec 2015, also ask for prevalence data across Europe.
- It is from a wide variety of positions (ranging from full professors to PhD students and also including Technical and administrative research staff e.g. research coordinators or laboratory personnel
- The sample size will be larger than most prior studies (which makes it easier to study smaller sub-groups and obtain statistically significant results)

3.3.2 Will we get good prevalence data?

Methodological concerns were raised in the consortium about asking the respondents about their own misconduct ("self-admission rates"). We therefore only ask about their knowledge about others' misconduct ("non-self-admission rates"), and about their own experience of unethical pressures.

With regard to data on the respondents' knowledge of other cases of misconduct, we ask about this at the faculty level. We will relate this to information about the number and key demographics (age, gender, position) of academic staff at the 8 PRINTEGER universities. Moreover, the PRINTEGER partners will provide us with information about the number of cases of misconduct that have been treated in their respective institutional committees for research misconduct and integrity. We must assume that many respondents that report knowing about a case, will refer to the same case, but because most previous studies have not corrected for the possibility of double counting in non-self-admission rates we will similarly not do any such corrections. By following standard procedures in the literature, the PRINTEGER survey will yield comparative and useful data on prevalence.

3.3.3 Will the confidentiality of the respondents be sufficiently protected?

The demographic data we ask for does not facilitate identification of particular subjects: We ask about age in 10 year categories and we do not ask about disciplines, only fields. For small universities there is still a theoretical chance that one might be able to identify specific individuals if we combined a sufficient amount of variables. However, as is clear from the information sheet we will not analyse or present the data in a way that allow for such identification.

In the project's public reports and articles we will not present data related to each individual university. Rather, our focus will be on the relation between different demographic and organisational variables and research misconduct/integrity. To the extent that comparison between institutions/countries will be done it will only show the variety among the institutions and not

present actual numbers for each university.[1] However, upon request we can deliver a confidential report with results pertaining to each individual university, as a way to facilitate their internal integrity work. Universities interested in such a report will need to ask us specifically for this. Also in such a confidential report we will take care in protecting the confidentiality of individual respondents and will not present data that allow for identifying individuals.

It should be noted that it is important to ask for institutions as a way to explain potential systematic variations. In the case that there is systematic variations between variables that cannot be otherwise explained, it may be explained by institutional characteristics. However, we will not present this by reference to named institutions in the public reports. In the descriptive bi-variate cross tables and in the multivariate regression analysis we will show the prevalence and probability of scientific misconduct across the universities where the names are replaced by numbers 1-8).

We will present bivariate and multivariate results broken down on gender, seniority level, academic fields, etc. because this is important information for our work and for the general audience. This is done in every published report or article from surveys on research misconduct and integrity and is essential for an open debate on these issues. Although it might be experienced as unpleasant by some, it is crucial that such information is in the public sphere in order to target integrity work in an effective way. This is an issue that characterises much social science research and is generally considered not only acceptable, but also important for public and academic dialogues about improving our societies.

3.3.4 Validity and reliability of the data

In order to yield high quality data surveys must have sample representativeness. In order to know whether there is a selection bias we must know the representativeness of the sample of respondents. We therefore need to gain information from each partner about:

- The total number of academic staff in your university and in the fields indicated in the survey
- The age of the academic staff (if numbers are available)
- The number of women versus men
- The number of academic staff by position incl. 1) Professor or equivalent, 2) Associate/Assistant Professor or equivalent, 3) Post-doc, 4) PhD student/Research or teaching assistant, 5) Technical and administrative research staff (Research coordinator or laboratory personnel, 6) Other (if numbers are available)

In this way we can calculate the drop-out rate and analyse if there is a systematic bias on some variables (i.e. do a non-response analysis).

Face validity is also a key issue and is largely determined by the way the questions (and response alternatives) are formulated. We have spent a considerable amount of time discussing these formulations and believe their resulting validity is adequate.

[1] However, it should be noted that many surveys do present numbers related to named institutions, for instance Nilstun et al. 2009 (PhD-students at six Swedish Universities) or Hoffman et al 2013 (PhD-students at four Norwegian universities). Fanneli 2009 is also naming several American universities in her systematic review and meta-analysis of survey data on fabrication and falsification of research.

The most important reliability issue for the survey is that it has internal consistency; i.e. that we use comparable categories across the survey, and also that we use previously validated questions and indicators of scientific misconduct in order to secure comparability. We have tried to ensure a high level of internal consistency in the survey.

4 Input to the protocol for focus groups

The focus groups will specifically explore how research integrity and misconduct is defined and understood by researchers and research managers, assess their perceptions regarding the causes of misconduct, and examine how integrity policies are received and work out in practice. An objective is to understand how issues of research integrity become salient and are responded to or "worked on" by these actors (cf. the concept of 'integrity work' Deliverable DII.6), as well as how such integrity work differs across research cultures and contexts. Different positions of power and responsibility will be taken into account. The complete protocol for the focus groups (48 pages) has been developed by the University of Bristol and can be accessed on the PRINTEGER website; we will therefor not include any details from this protocol here. We will only show systematically how the perspectives from DII.6 appear in the focus groups' semi-structured interview guides (what is called 'Initial Question Route Plans' in the full protocol for the focus groups). This is shown in table 3 below.

	Focus of study	Drivers for research integrity	Research questions for the organisational research	Participants/ interviewees
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? How do policies impact researchers and their practice? What is the support, interpretation and translation of integrity policies in research organisations?	Research managers Researchers Researchers and research managers
Normative pillar	Values, expectations, authority systems, conformity, pressures from key stakeholders (owners, the public, etc.)	Pressure from the media, politicians, professional associations, and other stakeholders. Formal evaluation criteria adapted to integrity goals. Professional values and perceptions of duty among researchers.	How do researchers and research institutions adhere to (different) expectations of research integrity from their stakeholders?	Researchers and research managers

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?	Researchers and research managers Research managers Researchers

Table 3. A table for organizational integrity work, as explored in the focus groups

These research topics will be central in the focus group study, which will be useful in gaining insights on the variety of comprehensions and experiences related to these issues across the different types of actors in the field.

5 Input for case study protocol

Although it was not foreseen in the proposal that this research protocol should inform the case study protocol, it is useful to include the case studies in order to show the consistency of the empirical work in the project. The full protocol for the case study can be accessed at the PRINTEGER website. Here, we just highlight the organizational aspects. These are integrated into the full protocol.

5.1 About the case studies in an organizational perspective

The overall idea regarding the case studies is to obtain data on specific incidents of scientific misconduct. The case data are (mainly) qualitative and provide in-depth, context-sensitive insights about the misconduct. The case studies are important in order to obtain insights into not only cases of misconduct in general, but also "grey area" incidents. Grey area incidents are alleged or questioned/problematized research activities; i.e. they are not obvious and spectacular, but rather debated and perhaps contested, context specific, difficult to spot and articulate (perhaps especially for the actors directly involved), and at least partly a part of "everyday" research practice.

The obvious cases are to provide insights on relevant (organizational) factors and conditions explaining the misconduct and the responses to it. The grey area cases provide insights on the important question of how certain activities come to be defined as misconduct, thus shedding light on the ambiguous and context-specific nature of misconduct.

From an organizational perspective, the case studies are beneficial as they enable us to explore the organizational or work context of the misconduct and the culprits. Of course the culprits are important, but they are here regarded as organizational actors rather than as individual wrongdoers. Hence, we expect there may be more at stake than simply (context-free) individual misconduct.

In deliverable II.6, we elaborated on several factors that may affect the propensity for research misconduct and (subsequent) integrity work. Here, we highlight some important matters for the case

study protocol drawn from this work. These have been integrated into the full protocol for the case studies.

5.2 Scientific misconduct

The first aspect is the actual misconduct. The most important element here is a "thick" description (as thick as possible) about the reported or disputed behavior, i.e. about the event or series of events. What was the problematic activity? Who reported it? Who was involved? What did relevant actors (those involved, research managers etc.) think about the case?

Moreover, it is of interest to know as much as possible about relevant organizational characteristics that might contribute to understanding the processes underlying the misconduct, for instance:

- Does the misconduct seem to be a particular "one off" incident or does it represent an ongoing practice, or a type of practice that could perhaps by some be regarded as "normal" in some way?
- How has the misconduct developed? Has it evolved gradually over time, or due to some external change, turning into some kind of opportunity for the involved actor(s)? Or is it the result of a personal dispute?
- How is the misconduct made sense of by the involved actors. How was the misconduct legitimized (justified, normalized) and de-legitimized? What were the central disputes and/or discussions regarding how to interpret the misconduct?

5.3 Responses to misconduct (integrity work)

From an organizational perspective, it is also interesting to study how the misconduct was responded to by the research institution. By this we mean not only the immediate responses (i.e. the processes of uncover and decision), but also the broader integrity work that was carried out in the aftermath.

As to the immediate responses, a thick description of the main storyline is of interest, i.e. what happened in the aftermath? What were the sanctions, or other relevant outcomes for the involved actor(s)? What have relevant actors learned from this incident? How was the misconduct explained/excused e.g., in the media?

As to broader responses, it is important to learn whether the incident led to any changes in research practices – on the organizational level, i.e. for all researchers, or on the individual/group level. In other words, how the organization has learned from the incident, and how this learning has materialized in the organization. Have for instance ethical guidelines been revised, are there new protocols or routines for controlling research outcomes, or even for controlling ongoing research? Are there ethics seminars? Etc.

5.4 Background information

In addition to the misconduct itself, organizational background knowledge is important for the analyses. This can be gained by identifying relevant documents on institutional policies regarding research integrity and misconduct, as well as documents shedding light on working conditions and culture, such as staff satisfaction studies.

Central background features relate to the scientific culture(s) at the department:

- Is the culture best characterized as individualistic, with an emphasis on performance and e.g. on "academic stars", or is it more collectivistic? Is there a culture for open discussion of ethical issues, or a culture preventing such discussions? Are there high power differences e.g. between professors and phd students, or is the culture emphasizing more power equality?
- Does the competitive situation (ambitions) influence the work situation for the researchers? E.g., are there high pressures to publish or to obtain funding? What happens with those that do not publish or do not obtain funding?
- Is there ethical ambiguity or uncertainty regarding how to conduct proper research. Is this something that is discussed at the department/university, or at least acknowledged? Do researchers feel they have the knowledge about ethical research conduct?
- What are the control systems in place? How are these regarded by the practitioners? E.g. are they actually used and/or regarded as positive?

6 Final remarks

PRINTEGER is focused on integrity, but in order to understanding integrity there is also a need to address questions of misconduct. Overall, we believe that there is an adequate balance between these perspectives in the survey, focus groups and case studies.

The protocols for the survey, focus groups and case studies have been developed with input from many perspectives. In this deliverable we have highlighted the organizational aspects of these protocols. As there are separate documents for the focus group protocol and the case study protocol, we have not referred these in detail here. However, we include in Appendix 1 the full websurvey guide, along with accompanying information (Appendix 2), since this is not published elsewhere.

All necessary ethical and data protection approvals have been gained or are in the process of being gained for the studies outlined here. The work will not begin until all necessary approvals have been acquired. All approvals will be submitted to the European Commission, in accordance with the Grant Agreement.

7 Appendix 1: Survey questions, including information to participants and consent formulation

Information to participants

This survey is carried out as part of the PRINTEGER project (www.printeger.eu), funded by the European Union's Horizon 2020 framework program and carried out by eight research institutes. The project's mission is to enhance research integrity by promoting a research culture in which integrity is part of what it means to do excellent research, and not just an external and restrictive control system. To promote such a culture, an improved governance of integrity and responsible research has to be informed by practice: the daily operation of researchers and the tensions of a complex research system. This survey is one of several activities in the project, which is targeted towards improving integrity policies of national and international research organisations, and providing better tools for research leaders and managers. In order to achieve this, we need to better understand the perceptions, behaviour and attitudes of research professionals themselves, and we therefore hope you can spare approximately 20 minutes of your time to help us, by filling in this survey.

Using this survey, we will gather data on organisational policies on misconduct and integrity; whistleblowing mechanisms and attitudes; work environment features; perceptions of tensions and risks associated with misconduct and compromise of scientific quality; perceptions of integrity measures; and prevalence of misconduct. We will also ask some background questions.

The information gathered in this survey will be secured so that it is accessible only to the PRINTEGER research team in Oslo. Even if it might in some cases be theoretically possible to identify individuals by connecting background variables, this will not be done in the analysis, nor in the reporting of the data. We will not present comparative data naming the organisations included in the survey. Data will be securely stored at a password-encrypted PC for five years after the project is completed: then the data will be deleted.

In filling out the survey you should NOT reveal any information about individual persons. If you would like to report cases of misconduct, we encourage you to use the channels that are available in your organisation/country.

The survey has been approved by the relevant research ethics or data protection authorities in the PRINTEGER partner countries.

No data will be saved until the form is submitted. Because your answers will not be traced to your name and your name is not registered with any electronic identity, it will not be possible for us to remove your individual answers once they have been submitted in the web form.

If you have questions about the survey or about the project, please do not hesitate to contact the PRINTEGER partner in your country http://printeger.eu/consortium/, the partner responsible for the survey (ellenmarie.forsberg@hioa.no) or the project coordinator (H.Zwart@science.ru.nl).

Consent to participate

I consent to participate in the survey.

[Check]

ORGANISATIONAL POLICIES

Here we are interested in your research institution's policies for raising awareness of research misconduct and integrity.

1. Does *your research institution* have a written policy about research misconduct and integrity at the following levels? (yes, no, don't know)
    a. My department
    b. My faculty
    c. My university
    d. Other relevant unit

2. On a scale from 1 to 10 (with 1 being "very unsure" and 10 being "very sure") how confident are you in your understanding of scientific misconduct?

3. How are new employees introduced to research integrity in your department? [No particular introduction, ethics course, oral introduction to ethical guidelines, written information about ethical guidelines, don't know] [several answers possible]

4. How consistently do managers in your department communicate high expectations for research integrity? (Not at all (1), Somewhat (2), Moderately (3), Very (4), Completely (5), "No basis for Judging").

WHISTLEBLOWING

Here we are interested in the mechanisms for and attitudes towards whistleblowing when it comes to research misconduct.

5. To what degree would you feel responsible to report internally or externally the suspected misconduct if you witnessed any of the following (to a large degree, certain degree, small degree, not at all)
    a. Fabrication of data
    b. Plagiarization
    c. Falsification of data (i.e. manipulating research materials, equipment, or processes, or changing or omitting/suppressing data or results without scientific or statistical justification, such that the research is not accurately represented in the research record. This would include the "misrepresentation of uncertainty" during statistical analysis of the data)
    d. Selective dropping of data from “outlier” cases without transparent explanation
    e. Trying out a variety of different methods of analysis until one is found that yields a result that is statistically significant
    f. Withholding data from the research community
    g. Falsification of bio-sketch, resume or personal reference statements
    h. Non-disclosure of a conflict of interest
    i. Pressure from a study sponsor or contractor to engage in unethical research conduct or skewed presentation of research
    j. Other misconduct (please specify)
6. Do you agree with the following statements about whistleblowing (to a large degree, certain degree, small degree, not at all)
    a. I know the appropriate routines for whistleblowing in the event of witnessing misconduct
    b. I feel confident that I would be protected as a whistleblower
    c. I feel confident that the faculty (or other relevant bodies in the university) would take seriously the whistleblowing and act accordingly
7. If you witnessed or heard about suspected misconduct, with whom would you discuss this? (several answers possible)

    a. Persons involved in the misconduct

    b. Department colleagues generally

    c. Research managers

    d. Department manager

    e. Research ethics committee staff

    f. Ombudsman

g. Union representative

h. Media

i. Nobody

j. Other [fill in]

WORK ENVIRONMENT

In this section we are interested in how you perceive your work environment with regard to research misconduct and integrity.

8. In your immediate work environment, how would you rate the following? (very low; low; medium/average, high; very high; don't know)

   a. Availability of academic positions
   b. Difficulty in obtaining tenure
   c. Pressure on researchers to obtain external funding
   d. Pressure on researchers to publish
   e. Severity of penalties for scientific misconduct
   f. Chances of getting caught for scientific misconduct if it occurs
   g. Researchers' understanding of rules and procedures related to scientific misconduct
   h. Management understanding of rules and procedures related to scientific misconduct
   i. My own understanding of rules and procedures related to scientific misconduct
   j. Researchers' support of rules and procedures related to scientific misconduct
   k. Management support of rules and procedures related to scientific misconduct
   l. My own support of rules and procedures related to scientific misconduct

9. In your department are there direct economic incentives (other than career advancement) for you individually related to (yes, no, do not know, do not wish to answer):

   a. Publication of scientific articles
   b. Acquisition of research funding
   c. Other (if so please describe)

10. To what degree do you agree/disagree with the following statements about the work environment in your department? (strongly agree, agree, neither/nor, disagree, strongly disagree)

    a. The work culture at my department is oriented more towards individual performances than towards collective performances
    b. I conduct most of my research alone rather than in collaboration with colleagues
    c. It is easy for my colleagues and managers to monitor and assess my research
    d. In my department there is a strong hierarchy between senior and junior researchers
    e. The culture of my department is supportive of openly resolving ethical concerns or research errors
    f. There is a shared understanding of what is good research conduct in my department
    g. My department managers' focus on research integrity is strong
    h. I frequently assess my own performance (for instance my H index, Research Gate score etc.) compared to that of my peers
    i. I have an active role in academic networks, associations or societies outside my own department
    j. In my department there is a culture for open discussion about research misconduct and integrity
    k. In my department there is a high level of pressure to commercialize results or outcomes of research
    l. In my department there is a high level of time and workload pressure regarding research activities

11. In your department, how guarded are people in their communications with each other out of concern that someone else will ''steal'' their ideas?

TENSIONS AND RISK

Here we are interested in what you perceive as risks related to research misconduct.

12. If you work in projects or take part in academic networks with scientists from other institutions, countries or fields, do you experience conflicting standards regarding proper research conduct? [Often, sometimes, seldom, never]

13. Do you experience a tension between loyalty to academic values of rigorous research and loyalty to [Often, sometimes, seldom, never]

    a. Funding bodies
    b. The department management
    c. Co-workers
    d. The subjects of the research
    e. Others (if so please describe)

14. In my faculty, I perceive research misconduct to be a minor problem (agree strongly, agree slightly, neither agree nor disagree, slightly disagree, strongly disagree)

15. In my field of research, I perceive research misconduct to be a minor problem (agree strongly, agree slightly, neither agree nor disagree, slightly disagree, strongly disagree)

16. In research in general, I perceive research misconduct to be a minor problem (agree strongly, agree slightly, neither agree nor disagree, slightly disagree, strongly disagree)

17. How do you rate the risk that you might be personally implicated in research misconduct or questionable research practices? (Impossible, very unlikely, unlikely, somewhat likely, likely, very likely)

RESEARCH QUALITY

Compromised research quality may in some situations be a question of research integrity and we are therefore also interested in factors that may affect quality.

18. Have any of the funders of research projects you have been involved in ever unduly interfered in your work? Yes, no, do not wish to answer. If yes, please elaborate.

19. Do you believe that the quality of your research varies depending on the funding source? Yes, no, don't know

20. Does the quality of your research

    a. Suffer due to strict time constraints? Yes, no, not sure
    b. Suffer due to insufficient available data? Yes, no, not sure
    c. Suffer due to other reasons (if so, please describe)

21. Do you believe that you have a better chance of getting your research published if you draw stricter conclusions or avoid mentioning uncertainties in the abstract/conclusion of your study (but rather in a limitations section)?
    Yes, no, don't know

22. Do you attempt to publish findings also when they are negative or inconclusive in respect to a specific research question?
    Always, sometimes, rarely, never, not relevant

INTEGRITY MEASURES

Here we are interested in how you perceive potential integrity measures.

23. In order to strengthen research integrity and/or reduce the risk of misconduct, to what degree do you agree that the following measures are useful (strongly agree, agree, neither/nor, disagree, strongly disagree)

    a. Increased monitoring internally (by managers)
    b. Increased monitoring internally (by peers)
    c. Increased monitoring externally (for instance by research funding organisations)
    d. Change of performance criteria and rewards
    e. Ethical reflection groups and open dialogue
    f. Managerial emphasis and attention to research integrity
    g. Increased severity of sanctions
    h. Information on ethical guidelines
    i. Online training tools
    j. Conventional training and education in research ethics
    k. Other [specify]

PREVALENCE OF SCIENTIFIC MISCONDUCT

Here we are interested in your personal experience with misconduct.

24. Have you known about or justifiably suspected that any of the colleagues in your faculty during the last 12 months has (Yes; no, uncertain/do not know; do not want to answer; not applicable)

    a. Fabricated data

    b. Plagiarized data

    a. Falsified data

    c. Selectively dropped data from "outlier" cases without transparent explanation
    d. Tried out a variety of different methods of analysis until one is found that yields a result that is statistically significant
    e. Deliberately withheld data from the research community to gain personal or institutional advantage

    f. Falsified biosketch, resume, reference list

    g. Not disclosed a conflict of interest

    h. Claimed undeserved authorship

    i. Denied authorship to contributors

    j. Been pressured by a study sponsor or contractor to engage in unethical research conduct or skewed presentation of research

    k. Carried out other misconduct (if yes, specify)

25. Have you during the last 12 months been exposed to unethical pressure concerning (Yes; no, uncertain/do not know; do not want to answer; not applicable)

    a. Ordering/inclusion of authors

    b. Design/method

    c. Analysis of data

    d. Presentation of results

    e. Other, please specify

26. If you answered 'yes' to having been exposed to unethical pressure; please indicate the sources of the pressure:

    a. The commissioner/funder of the research

    b. Stakeholders with interest in the research

    c. Colleagues in my faculty

    d. A manager in my faculty

    e. Colleagues outside my faculty

    f. Colleagues or managers at a former employer

    g. Other, please specify

27. If you have first-hand knowledge of specific situations of scientific misconduct please select one situation and answer the following questions. Please do not include any identifying information.

- I do not have first-hand knowledge of a case
- I do not wish to answer
-
- If you have first-hand knowledge of a case, please elaborate:
- How did you first learn about the instance of scientific misconduct?
- Please describe the specific instance of scientific misconduct
- What did you do when you became aware of it?
- Whom (titles only) did you talk with about the scientific misconduct? How did you feel during this experience?
- Were you able to talk with the individual(s) who were involved about it? Please describe your interaction.
- Was the instance reported? If so, to whom and by whom? Whether the decision was to report or not, how was the decision made? What were the factors underlying the decision to make the report?
- What was the outcome? How did you feel about the way it was handled?
- Did you think anything changed as a result?
- Is there anything you would have done differently?

BACKGROUND QUESTIONS

Here we would like to gain some more information about background variables that might be relevant to explain experiences and that will help us design well-targeted recommendations for effective integrity measures.

28. How many academic (peer-reviewed) publications (including co-authored papers) have you authored over the last year? (0, 1-2, 2-5, 6-9, 10 or more)
29. Do you belong to any association for research professionals? (Yes; no; do not know; not applicable; do not want to answer).
30. How many lectures, workshops, or conferences on research ethics have you attended (or held) in the past year? 0; 1-5; 5-10; 11+
31. How satisfied are you with your current work situation (i.e. your well-being at work)? (Very satisfied, quite satisfied, neither satisfied nor dissatisfied, quite unsatisfied, not satisfied at all)
32. To what extent do you identify with the professional culture and values of your department? (To a large extent, to a certain extent, to a small extent, not at all, don't have an opinion, don't know)
33. Age
    a. 20-29
    b. 30-39
    c. 40-49
    d. 50-59
    e. 60-69
    f. 70+
34. Gender
    a. Male
    b. Female
    c. Other
35. Employed at
    a. University of Bonn
    b. University of Bristol
    c. Free University of Brussels
    d. University of Leiden
    e. Radboud University
    f. University of Tartu
    g. University of Trento
    h. Oslo and Akershus University College of Applied Sciences
    i. Other/Do not wish to answer
36. Highest academic degree
    a. Doctoral degree
    b. Master's degree
    c. Bachelor's degree

d. Other degree

37. Academic field (of your highest degree)
    a. Engineering sciences
    b. Language, information and communication
    c. Law, arts and humanities
    d. Medical and life sciences
    e. Natural sciences
    f. Social and behavioral sciences

38. Current academic position
    g. Professor or equivalent
    h. Associate/Assistant Professor/Senior researcher/Lecturer or equivalent
    i. Teacher
    j. Post-doc
    k. PhD student/Research or teaching assistant
    l. Technical and administrative research staff (Research coordinator or laboratory personnel)
    m. Other (specify)

39. Do you currently have a manager or leadership role?
    a. No leadership role
    b. Project leader
    c. Personnel and administrative responsibility

40. Appointment
    a. Temporary
    b. Permanent

41. Where do you get your research funding? (several answers possible)
    a. Own institution
    b. Research councils
    c. Public or non-profit organizations
    d. Industry
    e. EU and other international funds
    f. Other
    g. Not applicable

42. Years active in research
    a. 0-5
    b. 6-10
    c. 11-15
    d. 16 or more
    e. Not applicable

Thank you very much!

To know more about the results of the survey and about the PRINTEGER project, please consult the project's website, www.printeger.eu.

For more information about research integrity, have a look at the following resources:

- Science Europe's brochure about seven reasons to care about research integrity: http://scieur.org/integrity

- The European Code of Conduct for Research Integrity, developed by the European Science Foundation and All European Academies (ALLEA): http://www.esf.org/index.php?eID=tx_nawsecuredl&u=0&g=0&t=1477571132&hash=5f490c969e5e4e7f526152446e1cda0ad271175c&file=fileadmin/be_user/CEO_Unit/MO_FORA/MOFORUM_ResearchIntegrity/Code_Conduct_ResearchIntegrity.pdf

- A report by the European Science Foundation Member Organisation Forum on Research Integrity: Fostering Research Integrity in Europe: http://www.esf.org/index.php?eID=tx_nawsecuredl&u=0&g=0&t=1477595067&hash=00aaae3f8d4d0e742b09ea07addcab3b98f64bd1&file=fileadmin/be_user/CEO_Unit/MO_FORA/MOFORUM_ResearchIntegrity/ResearchIntegrity_report_finalpublished.pdf

8 Appendix 2: Information about the PRINTEGER survey on research misconduct and integrity, to relevant organisational decision makers

About the project

PRINTEGER is a project funded by the European Union in the framework of Horizon 2020. Its mission is to enhance research integrity by promoting a research culture in which integrity is part and parcel of what it means to do excellent research, and not just an external and restrictive control system. To promote such a culture, an improved governance of integrity and responsible research has to be informed by practice: the daily operation of researchers and the tensions of a complex research system. PRINTEGER will contribute to improve adherence to high standards of integrity in research warranting high levels of public support for the sciences. In the short term, it will do so by improving integrity policies of national and international research organisations, but also by providing better tools for research leaders and managers. In the longer term, PRINTEGER will contribute to improve ethical awareness and reflection through the education of new generations of scientists with next generation educational tools.

The partners in the PRINTEGER project are Radboud University Nijmegen, University of Tartu, Vrije Universiteit Brussel, Oslo and Akershus University College, University of Bonn, University of Bristol, University of Trento and Leiden University.

About the survey

As part of the PRINTEGER work a survey will be carried out that provides information on organisational policies on misconduct and integrity; whistleblowing mechanisms and attitudes; work environment features; perceptions of tensions and risks associated with misconduct and compromise of scientific quality; perceptions of integrity measures; and prevalence of misconduct. We will also ask some background questions. The survey is planned to be carried out in the eight PRINTEGER partner universities. The survey will be web-based, using Questback, and the link to the survey will be distributed by the local PRINTEGER research team in collaboration with the rector, pro-rector for research, dean, or similar function at the University. An email with the survey link will be sent to an email list containing all academic staff, with a recommendation to fill in the survey. After approximately 2 weeks the same person will send out a reminder to all. These emails will contain information about the project and the survey (similar to this letter) and contact details to the responsible researchers in the PRINTEGER project. We kindly ask for your collaboration and support in distributing this survey in your organisation.

The information gathered in this survey will be secured so that it is accessible only to the researchers in PRINTEGER based at Oslo and Akershus University College (responsible for the survey). The analysis will be done in a way that prevents the identification of individuals in the publication of findings. In the project's public reports and articles we will not present data related to each individual university, but we will present mean values, standard deviation and information about minimum and maximum values. We will control for each university in the regression models, but will not show the

estimates for each university. Our focus will be on the relation between different demographic and organisational variables and research misconduct/integrity.

Upon your request we can deliver a confidential report with results pertaining to your university, as a way to facilitate your internal integrity work. If you are interested in such a report we kindly ask you to let us know as soon as possible. Also in this confidential report we will take care in protecting the confidentiality of individual respondents and will not present data that allow for identifying individuals.

Data will be securely stored for five years after the project is completed; then they will be deleted. All participants will be asked to respect the confidentiality of others and not to reveal any identifying information about themselves or others. In the event that previously unknown information of specific and identifiable instances of misconduct is revealed, we may be obliged to discuss this information with the internal ethics/integrity committee at the University involved. However, first this will be discussed in the PRINTEGER consortium and any legal and ethical issues related to such a potential case will be considered before any action is taken.

The information collected through the survey will be part of the material to be published in project deliverables and scientific articles in academic journals.

The survey will not be distributed until it has been approved by the relevant research ethics or data protection authorities in the PRINTEGER partner countries.

We hope for your cooperation in carrying out this survey and we encourage you to contact us if you have any questions regarding the survey.

Yours sincerely,

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