Cycles of invisibility: The limits of transparency in dealing with scientific misconduct

Felicitas Hesselmann1,2 and Martin Reinhart1,2

Abstract
Sanctions for plagiarism, falsification and fabrication in research are primarily symbolic. This paper investigates sanctions for scientific misconduct and their preceding investigation processes as visible and legitimate symbols. Using three different data sources (retraction notices, expert interviews, and a survey of scientists), we show that sanctions for scientific misconduct operate within a cycle of visibility, in which sanctions are highly visible, while investigation and decision-making procedures remain mostly invisible. This corresponds to high levels of acceptance of sanctions in the scientific community, but a low acceptance of the respective authorities. Such a punitiveness in turn exacerbates confidentiality concerns, so that authorities become even more secretive. We argue that punitiveness towards scientific misconduct is driven by such a cycle of invisibility.

Keywords
scientific misconduct, visibility, sanctions, punitiveness, transparency

Introduction
Sanctions for scientific misconduct are primarily symbolic: Scientists who falsify, fabricate or plagiarize usually face sanctions directed at their reputation, instead of prison sentences or monetary penalties. They are reprimanded, forced to retract publications or receive temporal bans on submitting papers to certain journals. The symbolic weight of

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such ‘mild’ forms of punishment is, nonetheless, considerable within the scientific community, as the associated loss of reputation can negatively affect collaborations with colleagues, publication success or job opportunities, even to the point of effectively ending research careers (Lu et al., 2013; Mongeon and Larivière, 2016). These symbolic sanctions in academia, where punishment relates to practices of knowledge production, are fundamentally related to visibility (Brighenti, 2007). Visibility has been shown to be of central importance both to the labelling of deviance (Inciardi, 1972) from a societal reactions perspective in criminology (Grattet, 2011) and to knowledge production in the sciences (Daston and Galison, 2007). In both domains, being able to make something visible, be it a scientific fact or a punishment for misconduct, exemplifies knowledge and power at once (Foucault, 1978).

Visibility is also embedded in particular regimes (Brighenti, 2007) and influenced by cultural notions about what can and should be made visible or presented to public view (Foucault, 1977; Pratt, 2000; Smith, 2008). It is at the same time closely tied to the legitimacy of sanctions as well as authorities: Visibility can help create legitimacy for penal authorities, particularly in the form of transparency (Mehrpouya and Djelic, 2014). Foucault (1977) displayed this relationship in his description of the Panopticon: Prisoners are controlled by potentially being visible to the guards at any time; while the guards themselves are supervised by the watchful public.

The present article investigates the complex relationship between visibility and legitimacy of sanctions, investigations and penal authorities. Its focus is on exploring how penal processes produce and prevent visibility and how this affects their legitimacy. Taking into account the practices preceding symbolic sanctions, we ask how coercive acts become legitimated as punishments as well as how punishment retroactively affects the visibility of the trial.

We use the handling of scientific misconduct as an exemplary case that differs from judicial practices of visibilization in important respects. Such an investigation poses two challenges: First, scientific misconduct itself is heterogenous and only weakly defined (Godecharle et al., 2014), with blurry boundaries between it and issues such as questionable research practices, research ethics or non-reproducibility. Likewise, institutions for dealing with scientific misconduct are fairly new and heterogeneous, with little empirical research on how they operate. Second, sanctions and punishment in science are issued by numerous actors—universities, journals, funders, etc.—forming a penal system with limited transparency, that is, with fragmented patterns of visibility (Hesselmann et al., 2017), so that knowledge from criminology and the sociology of deviance is of limited value. One of the most common assumptions about penal systems does not hold for science, namely that punishment relates to a central authority in a national context under the rule of law.

To account for the heterogeneity of reactions to misconduct, we utilize three different data sources in our empirical analyses that each provide a unique perspective on misconduct cases. First, semi-structured interviews with individuals responsible for handling cases of scientific misconduct at journals, universities, publishers and funders shed light on the processes behind sanctions such as retractions. Second, analyses of retractions and retraction notices provide insight into the symbolic strategies of sanctions for misconduct. Retractions are strategic research materials for examining the relationship between visibility and punishment: Compared with sanctions such as reprimands or terminations
of employment, which are mostly kept secret, they are highly publicized within the scientific community, and their punitive potential lies mainly in the visible stigmatization of researchers. There is also a substantial body of existing research addressing the phenomenon of retraction (for an overview see Hesselmann et al., 2017). Third, data from a survey of German researchers account for the symbolic impact of visible sanctions within the scientific community.

We find that sanctioning practices mainly operate on a case-by-case basis, and enacting individuals refrain from identifying themselves as sanctioning authorities. Retractions primarily symbolize that a sanction has been issued but provide little transparency on the processes that preceded the formal retraction. Scientists show exceptionally high approval of retractions and considerable support for punitive measures in general. We conclude that sanctions for scientific misconduct operate within a cycle of invisibility: The challenges in making visible the processes that precede the sanctions, such as their rare and incidental character, as well as confidentiality concerns, result in a low visibility for the investigation procedures. Sanctions are the only visible element, which fosters relatively high levels of punitiveness in the scientific community. This punitiveness in turn exacerbates the institutions’ concerns with confidentiality. The lack of a central penal authority strengthens the significance of symbolic aspects of sanctions to ensure trust in community-controlled forms of social control.

From an ideal to a deeply conflicted view of science

Scientists see themselves as less prone to error, bias and dishonesty, and thus as more rational and objective than the rest of the population. Non-scientists agree, although they see the difference as less pronounced (Veldkamp et al., 2017). An idealistic image of science has seemed to prevail. Scientific misconduct was once seen as ‘extremely infrequent’ (Merton, 1957: 651) and as unexpected behavior, providing little reason for addressing misconduct as a significant social problem that would require countermeasures. Correspondingly, the system of social control within science has traditionally also been relatively underdeveloped and weak (Ben-Yehuda, 1986; Zuckerman, 1984). However, it seems that this ‘storybook image of the scientist’ (Veldkamp et al., 2017) is waning.

Numerous measures to uncover, sanction or prevent scientific misconduct have been implemented in the last decade, and the rising number of retractions has been emblematic of this development (Hesselmann et al., 2017). National organizations for research integrity (e.g. the Office of Research Integrity, ORI, in the US), online platforms (e.g. PubPeer, RetractionWatch), ombud systems in research organizations, and codes of conduct in scientific publishing are becoming more visible within science and in the public sphere. These initiatives form an emerging judicial or penal system (Cavadino et al., 2013: 1ff.) within science, and despite their dynamically changing activities, they have made increasing numbers of cases of misconduct visible. As a result, scientific misconduct is beginning to be treated by many as a widespread phenomenon, of which only the ‘tip of the iceberg’ is seen (Sovacool, 2008).

Accepting misconduct as a widespread phenomenon has made questions about science’s ability to effectively govern itself (e.g. through peer review) more prominent (Guston, 2000). With respect to misconduct, the questions revolve around issues well
known to criminology and the sociology of deviance (Faria, 2018; Hesselmann et al., 2014): detection (e.g. can allegations be made anonymously on social media platforms and who can investigate?), sentencing (e.g. does a retraction suffice or are criminal charges necessary?) and reporting (e.g. should punishment for scientific misconduct be made public or kept confidential?). On the one hand, these issues address practical concerns, as accurately determining the prevalence of scientific misconduct and finding best practices to deal with it are relatively new and difficult. On the other hand, the increased visibility of misconduct forces scientists and the public alike to make sense of misconduct when the conventional storybook image of science does not apply anymore. Both aspects, practical concerns and meaning making, come together in the most frequent stance in current debates, which interprets misconduct as something that happens ‘in the dark’ and for which transparency and public accountability are the most evident countermeasures (Sovacool, 2008).

Theorizing misconduct as an issue of visibility

The idea that transparency fosters accountability has a long and rich history (Mehrpouya and Djelic, 2014). It is commonly accepted in Western societies that transparency is closely tied to democratic ideals and legitimizes forms of social control. Liberal theorists, and especially Adam Smith (1981, 2004), have argued that economic and political transparency go hand in hand, as the market allows for social control by the many (Mehrpouya and Djelic, 2014: 17). However, transparency can also be invoked to legitimize the control of the many, as for example, in Jeremy Bentham’s ideas exemplified by the Panopticon (Bentham, 1781; Foucault, 1977). While transparency is generally seen as being good and desirable, it has no clear link to specific forms of social control and can be invoked to justify different governance regimes (Mehrpouya and Djelic, 2014). The same can be said for visibility as a more ‘general category for the social sciences’ (Brighenti, 2007: 323), in that visibility and control align in multiple ways, as has been shown in criminology and the sociology of deviance. Labelling theory has introduced the idea that whether persons and acts are seen as deviant is mainly determined by their visibility (Inciardi, 1972; Lemert, 1967). The work of sanctioning authorities and systems of social control consists largely of uncovering previously hidden, invisible acts (crimes) and making them visible to the public through sanctions. Often this entails stigmatization of the offender, who is pushed into a zone of hypervisibility (Brighenti, 2010: 47; Kitsuse and Spector, 1975). For the case of scientific misconduct, visibility yields paradoxical effects, in that it may increase the risk of highly prominent or reputable persons to be observed committing misconduct, but it might also shield them from being openly accused of wrongdoing (Fuchs and Westervelt, 1996: 255). More generally, visibility plays a defining role in any measure addressing misconduct.

Penal procedures thus open up complex relationships between the visibility of persons, sanctions and penal authorities. The modern concept of ‘Rechtsstaat’ (Mona, 2013) is a widely accepted ideal of a penal system in which specific configurations of visibility influence the legitimacy of penal processes. It can be described in terms of a high visibility of the judicial process, including all its decisions, and a very low visibility of the sanction (McGowen, 1994; Pratt, 1998). Such a regime of visibility draws meaning and
legitimacy from the aforementioned idea that transparency fosters accountability (Mehrpouya and Djelic, 2014). Here, the legitimacy of the outcome depends on the judicial process and on the values, such as fairness, equity and formalism, that this process is believed to embody: “rightness” is automatically conferred on any decision the system produces’ (Fish, 1994: 177).

While this concept of transparency and rule of law presents an ideal that is widely held and that many, if not most, state penal systems try to emulate or make claims to, it is not certain whether penal procedures in academia will follow the same model. In the case of scientific misconduct and the institutions dealing with it, this relationship between visibility on the one hand, and power and control on the other, might be less clear-cut. As scientific institutions, they are doubly concerned with visibility: They are involved in the production of knowledge, and as institutions of social control they are concerned with the ‘visibilization’ (Brighenti, 2007: 34) of such knowledge production. Depending on the circumstances, visibility can increase or decrease power and further or hinder knowledge production. ‘Visibility is a double-edged sword: it can be empowering as well as disempowering’ (Brighenti, 2007: 335). Current societies have developed more complex lines of sight than the relatively simple visual architecture of the Panopticon, in that those watching and those being watched, as well as those in control and those under control, are implicated in multipolar regimes of visibility (Maasen and Sutter, 2016). Both the public and authorities of social control are involved in creating, demanding, resisting and overthrowing areas of visibility as well as invisibility. This is also the case with respect to scientific misconduct. A multiplicity of actors is rendering misconduct visible (Fox and Braxton, 1994; Fuchs and Westervelt, 1996): journals, whistleblowers, the ORI, ombud systems, collaborative online platforms, etc. with no discernible central authority. Academic institutions might be complicit in keeping misconduct invisible in order to protect the cognitive authority of science (Gieryn and Figert, 1986; Fuchs and Westervelt, 1996); however, they might also opt for conducting especially visible investigations in order to showcase academia’s ability to self-regulate (Gieryn and Figert, 1986: 75). How visibility and control align in science is thus the open question we address by analysing how scientific misconduct is currently made visible.

Methods

The analysis employed a mixed methods design (Tashakkori and Teddlie, 2003), combining three different data sources and both quantitative and qualitative methods. Data sources were chosen in order to provide different strategic perspectives: (1) a perspective on the processes in place to investigate and sanction scientific misconduct at scientific organizations, (2) a perspective on the way the outcomes of these processes are communicated to the scientific community, and (3) a perspective on how those processes and sanctions are perceived by the scientific community.

The first dataset consists of 31 semi-structured expert interviews with those responsible for investigating and sanctioning scientific misconduct at journals, universities, publishers and funders. If possible, persons officially responsible for investigating allegations were identified via the organizations’ websites; otherwise, an inquiry was sent to a general contact asking to be pointed to a person in charge of handling allegations. The sample
comprises fourteen officials of German universities and German non-university research institutes (ombudspersons and members of investigative committees), nine editors of international journals, three people working for international publishers, three people at European funders, one spokesperson for the Committee of Publications Ethics (COPE), and the German Ombudsman for Science. All of the respondents held other responsibilities besides handling misconduct cases. Interviews were conducted face-to-face, if respondents were based in Germany at the time of field work (25 interviews) or otherwise via Skype (six interviews), and either in German or in English, based on the respondents’ preferences. Respondents were asked about their previous experience with scientific misconduct cases, their institutions’ procedures for handling cases, their outside communication and their cooperation with other actors and organizations, and their evaluation of their positions. As the first step of data analysis, the resulting interview transcripts were analysed with a content analytical approach (Mayring, 2010). Secondly, specific passages were selected for a qualitative in-depth analysis along the themes previously identified through content analysis. These themes comprised segments discussing external communication strategies, lack of transparency of own or other organizations, lack of control of compliance with policies, and the instrument of publishing bans. The selected passages were analysed with a sequential analytic procedure (Keller and Truschkat, 2014; Maiwald, 2005).

The second dataset consists of 127 retraction notices (see also Hesselmann and Reinhart, 2019) that inform readers about articles retracted for fraud, plagiarism or honest mistakes. Retraction notices were sampled using the databases Web of Science (53), EconBiz (41) and JSTOR (33). Depending on the characteristics of the respective database, different search strategies were employed. The Web of Science was searched for (title = retraction, doctype = Correction or doctype = Correction, Addition), based on a search strategy by Fanelli (2013; see also Schmidt, 2017). EconBiz and JSTOR were searched for (title = retraction*). False positives were manually removed, before sampling notices randomly stratified by period for JSTOR (1980–1989; 1990–1999; 2000–2014), and for WoS (1990–1999 and 2000–2014). All 41 notices identified in EconBiz were used. Notices were analysed linguistically. A first step of coding identified the textual moves of the notices, that is, sections of text that perform a specific communicative function (Upton and Cohen, 2009). This step was used to explore the overall function and the basic textual organization of the notices. Secondly, these moves were then coded for grammatical agents, voice (Rundblad, 2007; Swales, 1990), narrative mode and authorial references (Harwood, 2005; Hyland, 2002).

The third dataset includes data from the German Scientists Survey (Neufeld and Johann, 2018). This representative online survey was administered to researchers at 59 German universities at both mid-level and professorial levels and inquired about the general structures and working conditions within the German research system. The overall sample consisted of 4844 respondents; however, the items used in the present analysis were only administered to randomized sub-samples of respondents (see Tables 2 and 3 for details). The items used in the present analysis concerned the respondents’ acceptance of the different authorities and procedures dealing with scientific misconduct, as well as their support for various possible punitive and corrective measures. They were developed building on existing research about the perception and acceptance of sanctions for scientific misconduct (Braxton, 1991; Braxton and Bayer, 1996; Wenger et al., 1998).
The survey, and in part also the expert interviews, focus on misconduct investigations in Germany, while the analysis of retractions and the interviews with editors, publishers and funders address investigations at an international level. While the German ombud system has features specific to it, there is no strong national regulatory framework in place that would shape the handling of misconduct. With its heterogeneity of procedures and authorities, and its lack of central regulatory oversight, the German ombud system thus strongly resembles other European approaches (Godecharle et al., 2014; Horbach et al., 2018). Moreover, the interlacing of nationally based approaches (e.g. at universities) with international interventions (e.g. at journals) must be seen as a defining feature of the handling of misconduct that significantly contributes to its complexity and heterogeneity.

**Analysis I: Interviews**

The first perspective is provided by semi-structured interviews with people responsible for conducting misconduct investigations at various scientific organizations. Formally, they are the first point of contact for whistleblowers and other people wanting to report suspected cases. Depending on the cases, they can decide to dismiss the accusation or carry out investigations, including sequestering evidence, analysing data and documents, and interviewing the involved parties and possible witnesses (see also Horbach et al., 2018; Wager, 2007; Wilson et al., 2007). Additionally, they can also try to resolve the matter informally, through providing consultations or mediations between the parties, an approach that is particularly prevalent with ombudspersons. Based on the investigations, actors then form an opinion about the case and, to varying degrees, can be involved in final decision-making: While ombudspersons and investigative committees at universities and research organizations only issue recommendations to the university’s management who then are in charge of deciding on punitive or other measures, journal editors can typically make decisions about corrections and retractions independently. The interviews conducted here aimed at understanding these processes in more detail, including the specific understandings the actors developed of their work. In particular, we were interested in how those actors’ work relates to issues of visibility and legitimacy.

**Informal procedures**

Most respondents describe misconduct cases as exceptional, non-routine events that do not allow for the development of standardized courses of action (see Table 1 for an overview of the results). Respondents vary as to how long they have been holding their positions, and even respondents with similar incumbencies have seen widely different numbers of cases. Previous experience with cases was thus very varied: Four respondents had encountered no cases so far, thirteen respondents had encountered between one and ten cases, and seven respondents had encountered more than ten cases, two of whom said they had investigated more than 200 cases. Most respondents describe cases as idiosyncratic and diverse, hence not allowing for catch-all or standard approaches. All of the respondents hold other responsibilities, which are often quite substantial (e.g. editorial work, research and teaching, other management duties), and very few respondents report receiving formal training when first acquiring their
Table 1. Results of the content analysis of the semi-structured interviews.

<table>
<thead>
<tr>
<th>Codes</th>
<th>Examples</th>
<th>Codings</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td></td>
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<tr>
<td>None</td>
<td></td>
<td>4</td>
<td></td>
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<tr>
<td>1–5</td>
<td></td>
<td>8</td>
<td></td>
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<tr>
<td>6–10</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>More than 10</td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>No routinization</td>
<td></td>
<td>93</td>
<td>28</td>
</tr>
<tr>
<td>Learning-by-doing</td>
<td>'I mean, in a way, it was on the job and on a per-case basis type of training.' (Journal 6)</td>
<td>38</td>
<td>25</td>
</tr>
<tr>
<td>Individual cases</td>
<td>'So the problem with this is that no two cases are alike.' (European Research Council)</td>
<td>55</td>
<td>22</td>
</tr>
<tr>
<td>Routinization</td>
<td></td>
<td>48</td>
<td>18</td>
</tr>
<tr>
<td>Professional standards</td>
<td>'And in all of these, the thing that we do in an overarching way is that we try to be very professional with our members.' (COPE)</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Formal training</td>
<td>'There is a specific course which is meant for people in publishing that talks about misconduct. And I did that course.' (Publisher 1)</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Own routines, experience</td>
<td>'As we have 60–70 cases per year, there is a certain store of knowledge ... that you can then pass on.' (German Research Ombudsman)</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Negative evaluation</td>
<td></td>
<td>171</td>
<td>29</td>
</tr>
<tr>
<td>Lack of effectiveness</td>
<td>'It is difficult. I mean, such a committee hardly has any investigative powers.' (Investigative Committee Research Institute)</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Passivity</td>
<td>'We are not the police. It is not that if you find something like that, you will pro-actively get involved. That is also not how I would see (...) my role as an Ombudsperson' (Ombudsperson Research Institute)</td>
<td>55</td>
<td>22</td>
</tr>
<tr>
<td>Contradictions and problems in procedures</td>
<td>'[I: And in your experience, how is the response of universities if you do reach a person?] Again, I would be somewhat critical in that I've rarely had a good outcome there.' (Publisher 3)</td>
<td>43</td>
<td>20</td>
</tr>
<tr>
<td>Dis-identification</td>
<td>'And it's tough. All editors hate to deal with it, just hate to deal with it. They'd rather just not look at it and not see it.' (Journal 5)</td>
<td>54</td>
<td>21</td>
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<table>
<thead>
<tr>
<th>Codes</th>
<th>Examples</th>
<th>Codings</th>
<th>Respondents</th>
</tr>
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<tbody>
<tr>
<td>Positive evaluation</td>
<td>‘[I: If I understood you correctly, [cases] seem quite clear-cut, so you can resolve them quickly?] I’d like to think so, yes.’ (Ombudsperson University 2)</td>
<td>80</td>
<td>24</td>
</tr>
<tr>
<td>Trust in own processes</td>
<td>‘I think we do have a role. I think we have a role in creating awareness with our editors in chief. I think what we – we should definitely make certain things possible.’ (Publisher 1)</td>
<td>41</td>
<td>21</td>
</tr>
<tr>
<td>Identification</td>
<td>‘We would then bring [the case] to the publisher. However, I would do it through my – basically, like management process. So I mean, that’s how I raise it.’ (Journal 6)</td>
<td>39</td>
<td>13</td>
</tr>
<tr>
<td>Difficult collaborations</td>
<td>‘Our Committee cannot somehow suggest to the journal to proceed in any which way regarding authorship. We are not competent in that way.’ (Investigative Committee University 1)</td>
<td>143</td>
<td>30</td>
</tr>
<tr>
<td>No/failed collaboration</td>
<td>‘Because everything was handed over to the university, the university kept a very low profile.’ (Investigative Committee Research Institute)</td>
<td>48</td>
<td>22</td>
</tr>
<tr>
<td>No exchange of information</td>
<td>‘But at the same time, I would say that’s one of the big areas where I see room for improvement because, if you go to a university Website, you can hardly ever find the – yeah, the responsible person for raising these cases.’ (Publisher 3)</td>
<td>41</td>
<td>20</td>
</tr>
<tr>
<td>Lack of transparency</td>
<td>‘In the journal I work on specifically, […] we try to have very clear outside-facing and public-facing guidelines as to what the expectations are, the policies are, and all that.’ (Journal 6)</td>
<td>54</td>
<td>23</td>
</tr>
<tr>
<td>Successful collaborations</td>
<td>‘Our chairman is working very closely with the Ombudsperson here, and we were able to resolve many cases at an early stage.’ (Investigative Committee University 1)</td>
<td>239</td>
<td>31</td>
</tr>
<tr>
<td>Clear outside communication</td>
<td>‘So our Ombudspersons, especially one of them, is regularly taking part in those events of the German Research Ombudsman, where they exchange insights and also include international experiences.’ (Investigative Committee University 5)</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>Successful collaboration</td>
<td>‘We would then bring [the case] to the publisher. However, I would do it through my – basically, like management process. So I mean, that’s how I raise it.’ (Journal 6)</td>
<td>82</td>
<td>27</td>
</tr>
<tr>
<td>Exchange of information</td>
<td>‘We would then bring [the case] to the publisher. However, I would do it through my – basically, like management process. So I mean, that’s how I raise it.’ (Journal 6)</td>
<td>101</td>
<td>26</td>
</tr>
<tr>
<td>Well-defined, transparent responsibilities</td>
<td>‘We would then bring [the case] to the publisher. However, I would do it through my – basically, like management process. So I mean, that’s how I raise it.’ (Journal 6)</td>
<td>28</td>
<td>15</td>
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<td>Codes</td>
<td>Examples</td>
<td>Codings</td>
<td>Respondents</td>
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<tr>
<td>Vague procedures and policies</td>
<td>'I: Do you have any policies or guidelines that [...] you could fall back on if you have any doubts? No.' (Journal 10)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>No policies</td>
<td>'I: Do you issue any recommendations for possible punishments? It is possible. But I am not even sure we do that in every case, I have to admit. I don’t recall exactly.' (Investigative Committee University 3)</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Unknown policies</td>
<td>'Is that a case of deliberate misconduct, or is that an accidental misconduct? And that’s an area where I think the community has not really come up with very good guidelines.' (Publisher 3)</td>
<td>46</td>
<td>20</td>
</tr>
<tr>
<td>Ambiguous rules and definitions</td>
<td>'It really depends on – we look at it on a case-by-case basis.' (Publisher 1)</td>
<td>64</td>
<td>28</td>
</tr>
<tr>
<td>Case-by-case approaches</td>
<td>'The policies we already had [...] although it turned out that they again are so abstract that when you try and translate them into daily practice, or work instructions, that doesn’t work.' (Investigative Committee Research Institute)</td>
<td>37</td>
<td>20</td>
</tr>
<tr>
<td>Abstract policies</td>
<td>'And to me, the weakness is that, as an external funding body, this feeling that after all these months of work, sometimes, you do not know if there has been any consequence.' (European Research Council)</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>Unresolved cases</td>
<td>'And in some cases when we do suspect multiple cases, then sometimes we just informally talk to colleagues and hear from each other.' (Publisher 3)</td>
<td>46</td>
<td>18</td>
</tr>
<tr>
<td>Informal networks</td>
<td>'Yeah, I mean, this – so first of all, we have our own Website with a flowchart for, let's say, eight or so.</td>
<td>56</td>
<td>18</td>
</tr>
<tr>
<td>Clear procedures and policies</td>
<td>'In the COPE guidelines, they mention, if someone is senior, then you need to contact the institute because these people should know better.' (Publisher 1)</td>
<td>40</td>
<td>20</td>
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<tr>
<td>Familiar with policies</td>
<td>'And so for example, if somebody's making a lot of trivial allegations across a whole load of different journals, you know, you can see, to be honest, that they're not ones that are going to hold up. But even so, you tell the journals that they shouldn't dismiss the matter at hand. You should have a process for triaging them.' (COPE)</td>
<td>45</td>
<td>17</td>
</tr>
<tr>
<td>Well-defined procedures</td>
<td>'Yeah, I mean, this – so first of all, we have our own Website with a flowchart for, let's say, eight or so.</td>
<td>56</td>
<td>18</td>
</tr>
<tr>
<td>Utilizing policies and other resources</td>
<td>'I: Do you have any policies or guidelines that [...] you could fall back on if you have any doubts? No.' (Journal 10)</td>
<td>2</td>
<td>1</td>
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</table>
positions. Rather, they employ a learning-by-doing-approach, requiring constant adaptation to new cases and problems.

Consequently, processes are frequently described as following a case-by-case-logic rather than having a clear-cut procedure in place. Some respondents do report utilizing institutional policies, flowchart diagrams or other resources and at times also demonstrate quite extensive knowledge of formal definitions and guidelines. Nonetheless, they also often describe policies as being more in the background and too abstract or ambiguous to aid decision-making, and sometimes report having no knowledge of the respective institutional policies at all. Respondents also frequently discuss situations in which cases reached an impasse and could not be resolved; the decision-making procedures are possibly insufficient for addressing the high levels of uncertainty in many cases. Additionally, many respondents resort to informal networks and solutions to advance investigations.

Investigations sometimes require inter-organizational cooperation, such as between journal editors and university ombudspersons. Despite relying on informal networks, respondents frequently mention a lack of transparency concerning responsibilities and processes of other actors, describing investigations at other institutions as inscrutable. They discuss situations in which working together or sharing information with other organizations failed. Communication between organizations is often described as minimal, providing only short reports on investigation results and almost no insight into the respective investigative processes. However, interviewees also frequently describe transparent responsibilities and successful cooperation between actors. A more detailed look at the data reveals that most successful collaborations involve different actors at the same institution, such as ombudspersons and investigative committees, while inter-organizational cooperation seems more prone to failure.

Most of the respondents are critical of their own processes and positions, frequently discussing problems or contradictions they face, lamenting lack of effectiveness of their interventions, and not identifying with their position. To avoid the pitfalls of highly uncertain and unresolvable cases, respondents describe their preferred course of action as staying rather passive and not taking initiative. Misconduct investigations are thus pictured as highly uncertain, idiosyncratic processes that do not allow for routines, standardization or professionalized procedures, but rather need to be approached on a case-by-case basis. Formalized policies and guidelines seemingly provide only minimal direction, placing high demands on the respondents' ability to navigate uncertain and highly ambiguous situations. Many respondents thus express dissatisfaction with their positions and their responsibilities, describing them as a necessary but ultimately unpleasant duty to the scientific community.

The value of transparency

Looking at how these actors communicate details about their investigations to a larger scientific audience and how they in turn get informed about other actors' investigative processes reveals that respondents recognize the value of transparency, both for facilitating cooperation between actors and for creating public trust in misconduct investigations:
So I mean, a retraction is not good for the reputation, but it … there can be some recognition for the journal if the retraction is handled properly and transparently. So the critical thing would be to make sure there is a due process and that it does make an informed decision and that that notice is as transparent as possible in terms of what the issues were. And I think, again, it is due process and transparency. And I think that, depending on how the issue that arises is handled, it can be actually not a bad thing for the journal if they are seen as having very robust processes in place. (Journal 6, Multidisciplinary: 81)

As this quote illustrates, transparency is mostly created on a case-by-case-basis, especially in the event of a retraction. Typically, publicly available information about investigations differs according to whether they resulted in findings of misconduct or not. The ORI, for example, only publishes case summaries of cases that resulted in convictions, not of cases that resulted in acquittals (ORI, 2020). Likewise, retractions only publicize cases which attest to problems with articles (be they misconduct or error), while there is no publication format for investigations that do not substantiate the original allegations. Transparency is thus thought of mainly as an event. Consequently, respondents struggle to make their day-to-day activities and even their existence visible:

That the work took up so slowly is also partly due to the fact that at least in the beginning, the visibility of the commission within the university was not very good. Today, that is a little better, after you start working with the internet more and more, even though … I will meet with a colleague in a few days who is also a member of the commission, we want to improve our online presence, because, simply, if you do not know anything about the commission, and don't know its name, then it's very difficult to find it. (Investigative Commission University 5: 79)

Independent of convictions or high-profile scandals, it seems difficult to make the existing system visible to a wider audience and to prove that it is working properly. This shows both as a struggle for respondents to make their own positions known to others and as a difficulty to gain insight into others’ processes and investigations: As already mentioned, inter-organizational cooperation is seen as highly problematic and prone to failure. One of the main reasons for this is a perceived lack of communication about ongoing investigations and a general lack of transparency regarding responsibilities and organizational structures:

There's a fixed protocol that we publish also on our websites. It's basically a flowchart. And one of the steps in the flowchart is that you should always notify the managers of that particular person who is being investigated, including the university integrity officer, if that exists. But at the same time, I would say that's one of the big areas where I see room for improvement because, if you go to a university website, you can hardly ever find the responsible person for raising these cases. So universities could make this more visible on their website I think. And they could be more transparent that they have a role to play and that they have nominated people to deal with these cases and create a form of some sort or an email address or whatever and so that people can report on cases. (Publisher 3: 16f.)

Throughout these complaints, lack of transparency is often equated with lack of actions taken. Interviewees have a pervasive suspicion of cover-up and obfuscation which, perhaps ironically, they both hold against other institutions but also feel threatened by
themselves. Lack of publicly available information about cases is taken by default as a sign that the respective institution remained inactive and has no interest in getting to the bottom of allegations:

Well with retractions we will also notify the institution, most of the time. And there isn't much more we can do. Well, if the dean simply says, 'Okay, I think that's great!' there's not much more I can do, yes? Yes. [I: In your experience, what is the reaction of universities?] Well, that also differs. Sometimes you hear back immediately and sometimes you don't hear anything at all, then there's probably also nothing happening. Yes. (Journal 7, Natural Sciences: 101)

In contrast with other calls for transparency, motivated by the fear that lack of public oversight increases unwanted action, such as corruption or unusual punishment, transparency in this case is thought of as a means to compel institutions to take action, rather than to hinder them. What these excerpts highlight, then, is that respondents generally acknowledge the value of transparency, even though their hopes for transparency are often disappointed. They both expect other actors to provide transparent processes and at times strive to make their own work more visible and accessible to others.

The value of confidentiality

Despite this general belief in transparency, however, respondents sometimes also value confidentiality, secrecy and non-disclosure, thus actively contributing to an overall lack of transparency. A prominent situation in which respondents report prioritizing confidentiality over transparency is if publication of information has the potential to hurt any of the involved parties, such as the complainant or the defendant:

Well the idea … that any institutions are contacted, either universities or something like that, that does not happen. To me it also seems to be completely unusual in the entire Anglo-Saxon domain. When I somehow addressed that [in the editorial meeting] all the Britons crossed themselves and said: 'That you cannot do!' Because the consequences are also massive, yes? Well in that case you obviously also destroy academic careers [I: Yes, yes.]. And nobody really wants that. (Journal 10, Humanities: 62 ff.)

The assessment of whether information is potentially harmful can be broad; here, any sharing of information is considered dangerous and even morally reprehensible, thus calling for entirely confidential processes. Another reason to avoid enforcing transparency is to protect a climate of trust between scientists. Here, transparency is mostly seen as a form of monitoring and surveillance that editors, ombudspersons and other officials enact vis-à-vis researchers and that is mostly portrayed as negative. It is contrasted with a culture of trust that eliminates the need for constant, ongoing control:

I also think it's bad if it eventually looks like every researcher was a potential fraudster and that I have to assume that in general …. But I'd wish that we fostered a culture of trust, because it just doesn't work otherwise. I have to trust things all the time and I also have to be very … well, if something goes wrong, that does not mean somebody with bad intentions. (Ombudsperson University 5: 223)
The lack of transparency that is created out of the concern for others, however, also gives rise to informal procedures, reduced accountability and a form of secret knowledge that is only shared among particular circles. Information is shared strategically, to enable cooperation between certain actors and hinder cooperation with others. It becomes a tool that actors can use to achieve specific goals:

What we do have is a possibility to flag certain authors to one another. … But it's really on an editor in chief level. We actually sometimes do it at [publisher level] as well, where we have come across someone who is, we have a case right now, who has published a lot of articles, was very prolific. … And then we see a pattern in those cases. Yeah, we have to, we then talk to one another internally and say, ‘We have come across this case. At least alert your editor in chief to this particular person and let him or her investigate as well what has happened for that particular journal.’ And I think that's also our role. It's a bit … you have to be careful how much information you want to share. This is always very confidential. And it's making our lives here as a publisher quite complicated because people expect us to take certain actions. And sometimes, they don't understand our confidentiality and legal issues with that. (Publisher 1: 152)

Confidentiality then serves multiple purposes. On the one hand, it protects the reputation and the careers of third parties involved in investigations, and shields research staff against constant scrutiny and surveillance. On the other hand, it helps to create information that is valuable precisely because it is not publicly shared, information that can be used to gain comparative advantages, as in the quotation below:

Of course, we also have databases where we can include comments, where we can also have authors, when you say there was misconduct, and then it is also possible that you say, okay, this author gets banned for a certain amount of time. And that is also included in the databases. But we refuse to share this database with others and to make it public. … Others will have to find that out themselves. (Publisher 2: 22)

Having access to information can thus coincide with having access to specific circles, networks or alliances that are in the know. It becomes a valuable resource as well as a token of status and power. Respondents' criticism of other institutions’ lack of transparency can also be read as a protest against being excluded from resources and informed circles, and suffering disadvantages in the context of institutional politics. In the quotation below, the respondent laments the lack of transparency within her own organization:

When there's a suspicion, for example involving a dissertation, I do not hear about that. Because I only learned indirectly that somewhere a doctorate degree was revoked. And … and then I asked if that happened frequently. Because it was said that it happened a couple of times recently. But I am not informed of that. It is only if somebody comes to me with a problem. (Ombudsperson University 4: 47)

The lack of information is seen as a setback and an undermining of the respondent's authority as an ombudsperson. Although being able to access informal flows of information, the respondent seems dissatisfied that she is not included in the official communication chain, which she also sees as a lack of institutional support for her position. Withholding information thus also creates and enacts hierarchies both within and between
organizations. Notably, it is again only in the event of a conviction (such as revocation of a degree) that information about investigations is shared at all. Even internally, transparency is created in the form of specific events, rather than as a constant state.

The interviews thus reveal that while transparency is seen as a positive goal in general, it is rarely achieved in misconduct investigations. Besides cases being idiosyncratic and procedures being messy, information is also consciously withheld for reasons of confidentiality. Actors feel pressured to release information about cases to prove that they are taking action, but at the same time processes often are considered highly confidential. Actors struggle with making their work visible, and occasionally develop strategies to communicate their responsibilities on a more abstract level, such as creating specific websites and contact-forms for ombudspersons at the university level.

It is only in the moment of conviction and openly communicated sanction (such as a retraction) that the institutions' work is made visible and the institutions are provided with a chance to gain acceptance in the wider community. Thus, the particular ways in which visible sanctions shed light on the investigating authorities behind them are of central importance when trying to understand the relationship between visibility and legitimacy.

Analysis II: Retractions

Retraction notices can serve both as a correction to the literature and as a shame penalty (Karp, 1998) for scientists who have committed misconduct. In either case, they are an important format for communicating details about investigations to a wider public and hence to contribute to, or to cloud, the transparency of those processes. As has been shown elsewhere (Hesselmann, 2018; Hesselmann and Reinhart, 2019), retraction notices are generally short on details and offer only minimal information about the scientific problem under investigation and on the investigations themselves, often creating ambiguity instead of providing clarification. Building on the struggles with institutional visibility identified in the interviews, this analysis focuses on the question of how institutional actors and their respective activities and responsibilities are made visible (or concealed) in retraction notices.

We identified from the data twelve general textual moves: discussing problems with the original paper, retracting the paper, apologizing, providing excuses, allocating blame, expressing disapproval, explaining further steps, providing links to other documents, discussing authors’ positions on the retraction, introducing quotations, detailing publication history and acknowledging other researchers (see also Hesselmann and Reinhart, 2019). Such a variety of moves indicates that retraction notices are highly variable texts, and are used for a number of different purposes.

Asking about how notices portray misconduct investigations, we specifically focused on the two moves that contained information about the underlying investigations: discussing problems with the original paper, and retracting the paper. These moves were further categorized into four different processual steps inductively identified from the data: (1) detection of the problem, (2) investigation of the problem, (3) decision-making, (4) implementation of the retraction.

Analysing these steps for their grammatical agents, it can be shown that they were typically associated with different types of actors. Grammatical agents can be divided
into two groups with different responsibilities: The first group of actors, comprising authors, investigative commissions and other actors from outside the journal (e.g. readers, anonymous whistleblowers and third parties), is mentioned mainly in the context of detection and investigation of problems. Within the context of retraction notices, these actors are thus portrayed as legitimate investigative authorities. Contrary to the frequent descriptions of problematic communication between universities and journals in the interviews, in the retraction notices there is no mention of conflicting views: Whenever investigative commissions are mentioned, the journals' subsequent decisions are always portrayed as following the commissions' recommendations. The second group of actors, mainly actors from the journals (i.e. journal editors and publishers) and authors, is mainly associated with decision-making and implementing retractions. Journal editors (and publishers) seem to take on a very specific responsibility, as they are most often assigned the responsibility of deciding upon retraction and subsequently enacting this decision and are hence most often associated with the role of the sanctioning authority. Authors on the contrary are the only actors that belong to both groups, so their role in retraction notices seems less clearly defined than for the other actors.

However, the data reveal a third category of ‘no agents’ that warrants specific attention: This category comprises segments that only use agentless passive clauses, dummy it-subjects, metonymies or noun phrases. These clauses appear most often in the context of the implementation of the retraction, such as in these examples:

- We are therefore informing our readers that this article has been retracted. (WOS51)
- This article has been retracted due to plagiarism. (WOS35)
- In consequence, the article must be withdrawn. (JSTOR4)

The detection of problems also frequently features linguistic strategies that obscure the responsible actors:

- Concerns were raised about … (WOS66)
- Shortly following publication it was brought to the attention of the editors that … (ZBW36)

It thus often remains unclear how investigations were first set in motion, what procedures were followed, and who took on the responsibility of retracting the article. The only fact clearly discernible is the retraction itself.

It seems then, that the ambivalences around creating visibility identified in the interviews mostly translate into strategies of invisibilization in retractions. There are very few instances in which authorities make their idiosyncratic procedures and responsibilities transparent to a wider audience or create an image of accountability or procedural formalism. This finding in turn raises two questions: How are those vague and rather obfuscating retractions perceived in the scientific community? And how legitimate do the often-invisible authorities appear to be?
Table 2. Acceptance of sanctions against academic misconduct.

<table>
<thead>
<tr>
<th>Sanctions</th>
<th>Appropriate in any case</th>
<th>Appropriate in certain cases</th>
<th>Entirely inappropriate</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retraction</td>
<td>81.8%</td>
<td>16.2%</td>
<td>2.0%</td>
<td>2238</td>
</tr>
<tr>
<td>Revocation of funding decisions</td>
<td>40.3%</td>
<td>51.6%</td>
<td>8.1%</td>
<td>2167</td>
</tr>
<tr>
<td>Debarment from funding</td>
<td>37.8%</td>
<td>54.2%</td>
<td>8.1%</td>
<td>2129</td>
</tr>
<tr>
<td>Public services law consequences</td>
<td>35.6%</td>
<td>62.0%</td>
<td>2.5%</td>
<td>2193</td>
</tr>
<tr>
<td>Informal reactions</td>
<td>32.8%</td>
<td>44.0%</td>
<td>23.1%</td>
<td>2105</td>
</tr>
<tr>
<td>Discussions on social media</td>
<td>22.2%</td>
<td>32.9%</td>
<td>44.9%</td>
<td>2059</td>
</tr>
<tr>
<td>Termination of employment</td>
<td>20.4%</td>
<td>72.2%</td>
<td>7.4%</td>
<td>2182</td>
</tr>
<tr>
<td>No sanctions</td>
<td>0.5%</td>
<td>9.1%</td>
<td>90.4%</td>
<td>2089</td>
</tr>
</tbody>
</table>

Analysis III: Survey

To answer those questions, we turn to our third perspective, based on data from the German Scientists Survey 2016. As part of the survey, respondents were asked to rate the appropriateness of eight different measures as sanctions against scientific misconduct. Results (see Table 2) show that retractions enjoy exceptional levels of support, as 81.8% of respondents consider them to be an adequate reaction to misconduct in any case, with the revocation of funding decisions as the second ranking intervention only reaching an acceptance rate of 40.3%, and the debarment from funding at 37.8%. There are relatively high rates of conditional support for the termination of employment and other legal consequences according to German public services law (e.g. written reprimand, administrative suspension), with 72.2% and 62.0% of respondents finding them appropriate under certain circumstances, respectively. The reactions considered the least acceptable are discussions on social media, with almost 45% of respondents finding them entirely inappropriate, followed by informal reactions, which gain ambivalent levels of acceptance: While 32.8% of respondents think informal reactions suitable in any case, 23.1% think they are completely inappropriate.

A second issue concerned the acceptance of different authorities. Here, respondents were asked to rate the suitability of ten different institutional actors for exposing, examining and sanctioning misconduct. Taking a closer look at the respective areas of responsibility (see Table 3), three distinct groups of institutions emerge, depending on which of the areas gains the most acceptance: The first group contains actors seen as responsible for the detection of misconduct cases: reviewers, colleagues and superiors, internet-based initiatives, editors and the general media. Such diversity also mirrors the wide range of actors that retraction notices report as initiating investigations. The second group contains actors that enjoy support for being involved in investigations; these are investigative committees, university ombudspersons and the German Research Ombudsman. The third group comprises only two actors, department leaders and law enforcement authorities, seen as legitimate authorities for the punishment of misconduct.

Summing up the support for institutions across the different areas of responsibility (detection, investigation, punishment), investigative committees take the lead, followed by department leaders and superiors and colleagues. In contrast, institutions that are mainly active outside of science, such as internet-based initiatives and the general media...
only garner very low levels of support. A notable exception here is journal editors: Despite
journal editors typically being highly regarded in the scientific community, about 30% of
respondents believe that editors neither have a legitimate role in the detection, the investiga-
tion, nor the punishment of scientific misconduct. Reviewers also have low levels of overall
support, though a large majority (77.5%) believes they have a legitimate role in the detection
of misconduct cases, with the other two areas gaining rather low acceptance. Such an overall
rather critical view of institutions could be seen as consistent with their low visibility and
transparency and their idiosyncratic and unpredictable procedures for handling cases appar-
tent from the interviews and the retraction notices. It also corresponds to the quite critical
attitudes that institutional actors frequently expressed towards each other in the interviews.

However, comparing acceptance levels between sanctions and their respective author-
ities does not yield such a clear pattern: While the low levels of support for social media
discussions are in line with the meagre legitimacy of the respective institutions (internet
initiatives and general media), there is a striking difference between the surprisingly high
support for retractions and the low support for editors (especially when considering the
area of punishment). Journal editors do not enjoy high support by the scientific commu-
nity when it comes to dealing with misconduct. Their rates of disapproval are even
slightly higher than those of internet-based initiatives. Likewise, the relatively high lev-
els of opposition to informal reactions conflict with the preference for informal solutions
expressed by the responsible authorities in the interview data. Still, the vast majority of
respondents are in favor of sanctions, with 90.4% believing that refraining from sanc-
tions is never appropriate. This strong overall support for sanctions seems surprising,
given the highly differentiated and often critical views scientists hold of the various
authorities and their ascribed areas of responsibility.

Discussion

Comparing these different data sources allows us to trace the creation (and prevention)
of transparency in weakly standardized procedures and to investigate its consequences
for public support for the respective authorities. Because misconduct cases are rare events that are each experienced as idiosyncratic and one-of-a-kind, most actors fall back on case-by-case approaches that make investigations seem highly unplanned, unstructured and almost erratic. At the same time, confidentiality presents a central concern, as the identities of the involved need to be protected and investigations are occluded from public view. Furthermore, confidentiality is not just a necessary requirement but provides valuable resources in the form of confidential information for those who need to handle and decide upon misconduct cases. In this situation, it is only through sanctions that the highly inscrutable system of social control in science becomes visible at all. Sanctions present a way for actors dealing with deviance to prove that they are indeed performing the task they were mandated with, instead of remaining passive and sweeping problems under the rug. For the wider community, sanctions present both a way to acquire knowledge about deviance, which otherwise occurs only in secret, and to verify that the responsible actors are working appropriately. They are hence the only events that generate a form of retrospective transparency for a system that otherwise remains confidential and secretive.

Taking the ideal of the Rechtsstaat as a heuristic device for comparison, the specific relation between visibility of the penal procedures and visibility of the ensuing sanctions encountered in academia seems highly unusual. In academia, only convictions and the ensuing sanctions are occasionally visible to the wider public, while the investigations and trials are not made transparent. There are several reasons for such a lack of transparency. When particularly sensitive information is involved, confidentiality concerns arise. While for the general public transparency is usually empowering, the actors and authorities involved in the processes under question are typically much more critical of claims for transparency (Ringel, 2018), because they see it as threatening their autonomy and subjecting them to additional control (Florini, 2000). Legitimacy of these processes seems much more problematic and depends to a large part on the specific outcome of the procedures. The conviction and the ensuing sanction retrospectively and selectively shed light on their own process of production. Sanctions serve as the only kind of reliable information communicated to the public and thus confer a sense of legitimacy on the processes that produced them.

Our empirical analysis of the procedures surrounding scientific misconduct suggests that in science, visibilization mainly relies on sanctions.

Such an overreliance on sanctions to generate visibility and legitimacy translates into a punitive climate within the scientific community, which constantly calls for more and more sanctions. While the authorities themselves enjoy variable levels of support, sanctions are seen as the go-to solution for the problem of scientific misconduct. Support is especially high for sanctions, such as retractions, that are highly visible compared to most of the other interventions. They shed a (momentary) light on authorities, even though the insights they provide into penal processes remain limited and highly selective. It is only in these moments of sanctions that authorities seem somewhat transparent and amenable to public control. Sanctions such as the termination of employment, written reprimands or administrative suspension, which are issued by German research institutions, usually legally cannot be made public, to protect personal rights (Schulze-Fielitz, 2005). Informal reactions also only become
known to a small circle. These interventions are mostly not seen as helpful. Likewise, sanctions that do not provide a glimpse of the associated actors and authorities are not very well received. Discussions on social media and other web-based platforms often involve anonymous participants, which is heavily criticized. Here, the sanction violates confidentiality, but without also providing an insight, however fleeting, into the system of social control that produced it. Consequently, it is seen as doing more harm than good to the community.

**Conclusion**

Our analysis of the procedures surrounding scientific misconduct suggests that in science, visibilization relies mainly on sanctions. The findings presented here invite further research in several possible areas: A first theme concerns the complex relationship between visibility, control and knowledge production. An underlying idea of modern Western science is that in order to know something it has to be seen (Daston and Galison, 2007). The need to balance transparency and opacity lies at the heart of the politics of science (see the debates on open access, open data or responsible research and innovation) and justifies regimes of social control. In science, such regimes of control are conceived as mechanisms of quality control, such as peer review (Biagioli, 2002; Reinhart, 2012; Shapin and Schaffer, 1985), effectively rendering control over scientists and their practices as issues of the quality of knowledge.

Further research could also address the interaction between the visibility of sanctions and the visibility of persons that a system as described here produces. Typically, the visibility of persons increases their risk of being labeled deviant (Inciardi, 1972; Lemert, 1967), and consequently made ‘hypervisible’ (Brighenti, 2010) through sanctions. How this relationship plays out in academia, that is, whether highly visible or eminent persons stand at a greater or lower risk of being scrutinized and accused of misconduct, remains an open empirical question.

The regime of visibility found here can be described as circular. The procedures to uncover, to handle and ultimately to sanction scientific misconduct need to be kept mostly confidential. In the case of retractions, there is little that can be inferred from retraction notices about the work of investigation committees or editorial offices that led up to the decision to retract. Since the invisibility of dealing with misconduct raises the suspicion of inactivity, or worse, cover-up, sanctions obtain central importance. Sanctions that are highly visible either because, as a rare event, deviance is sensationalized in mass media, or, as with retractions, publicly communicated in the scientific literature are some of the only times the system for social control in science becomes observable to a wider audience. The high visibility of these sanctions serves, on the one hand, to legitimize the sanctions: Support for visible sanctions is generally high, while support for confidential sanctions (e.g. reprimands, termination of employment) is quite low. On the other hand, visible sanctions suggest to the public that deviance is a serious (and increasing) problem. Both prompt more investigations and more sanctions to give this visibility cycle an upward trend. The rising number of retractions and the rising number of journals issuing retractions (Fanelli, 2013) is an example of such a process.
The punitiveness found in the scientific community thus seems to be less of a result of individual attitudes or moral inclinations; rather, it emerges as a result of the problems related to making visible actions that are rare and incidental. Sanctions are the sole events that bind together the actions of social control institutions with the resulting symbols, thus creating a sense of transparency and accountability in the wider community. They are the only visible proof that authorities of social control are taking action when that action cannot be embedded in structures, positions and routines that could function as permanent symbols of penal authority.

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Notes
1. In the wider context, these questions also address perceived problems in the reproducibility (Atmanspacher and Maasen, 2016) or translatability (Blümel et al., 2015) of research.
2. Additional materials including information on how to obtain a scientific use file of the survey available at https://metadata.fdz.dzhw.eu#!/en/studies/stuscs2016$?page=1&size=10&type=surveys&version=1.0.0
3. The German Research Foundation, the largest German funder, requires universities and research organizations to appoint an ombudsperson in order to be eligible for funding. They also develop the ‘Guidelines for Safeguarding Good Scientific Practice’ (2019). However, these guidelines are not mandatory and the exact procedures and the responsibilities of ombudspersons are defined by each organization individually.
4. Seven respondents did not give an estimate of the number of cases they encountered, those include members of the Committee of Publications Ethics (COPE) and employees of the three Publishers, all of which presumably have seen (much) more than ten cases, and two journals and an ombudsperson, for whom approximations of the number of cases are not possible.
5. The question read: ‘Regardless of how serious the academic misconduct may be: in your opinion, which measures are appropriate in principle as sanctions against academic misconduct?’ German original: ‘Ganz unabhängig von der Schwere möglichen wissenschaftlichen Fehlverhaltens: Welche Maßnahmen bewerten Sie prinzipiell als geeignet um wissenschaftliches Fehlverhalten zu sanktionieren?’
6. The question read: ‘A range of very different institutions and persons is involved with examining and sanctioning academic misconduct. In relation to academic misconduct in general: in your opinion, which of the following persons or institutions are suitable for the work of
exposing, examining and sanctioning misconduct?’ German original: ‘Mit der Untersuchung und Sanktionierung von wissenschaftlichem Fehlverhalten setzen sich eine Reihe sehr unterschiedlicher Institutionen und Personen auseinander. Ganz allgemein auf wissenschaftliches Fehlverhalten bezogen: Welche der aufgeführten Personen oder Institutionen halten Sie jeweils für geeignet, um bei der Aufdeckung, der Untersuchung und der Sanktionierung von Fehlverhalten tätig zu werden?’

7. In this scenario, acquittals appear as very problematic. Acquittals as non-decisions, as decisions not to decide (Derrida, 2005: 15), seem like non-results of investigations and trials: While the authorities become visible in principle, they have nothing to show for their work. The process is not legitimized and falls apart into decisions that are neither transparent nor comprehensible and that are thus particularly difficult to justify.

References


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