The value-free ideal in codes of conduct for research integrity

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Topical Collection: The Legacy of the Value-Free Ideal of Science

Authors information

- Jacopo Ambrosj, Department of Public Health and Primary Care, Center for Biomedical Ethics and Law, KU Leuven, Kapucijnenvoer 35 Box 7001 3000 Leuven, Flanders, Belgium; Department of Philosophy, Universiteit Antwerpen, Antwerpen, Flanders, Belgium
  jacopo.ambrosj@kuleuven.be
  ORCID 0000-0002-6026-9285
- Hugh Desmond, Leibniz Universität Hannover, and Department of Philosophy, Hannover, Lower Saxony, Germany; Department of Philosophy, Universiteit Antwerpen, Antwerpen, Flanders, Belgium
  ORCID 0000-0002-4822-923X
- Kris Dierickx, Department of Public Health and Primary Care, Center for Biomedical Ethics and Law, KU Leuven, Leuven, Flanders, Belgium
  ORCID: 0000-0002-1016-1145

Author contributions
JA first performed data identification, characterization, and analysis. HD and KD independently reviewed each step of these passages. All authors contributed to the definition of the research question and the design of the research, and approved the final version of the article.

Abstract
While the debate on values in science focuses on normative questions on the level of the individual (e.g. should researchers try to make their work as value free as possible?), comparatively little attention has been paid to the institutional and professional norms that researchers are expected to follow. To address this knowledge gap, we conduct a content analysis of leading national codes of conduct for research integrity of European countries, and structure our analysis around the question: do these documents allow for researchers to be influenced by "non-epistemic" (moral, cultural, commercial, political, etc.) values or do they prohibit such influence in compliance with the value-free ideal (VFI) of science?

Our results return a complex picture. On the one hand, codes of conduct consider many non-epistemic values to be a legitimate influence on the decision-making of researchers. On the other, most of these documents include what we call VFI-like positions: passages claiming that researchers should be free and independent from any external influence. This shows that while many research integrity documents do not fully endorse the VFI, they do not reject it and continue to be implicitly influenced by it. This results in internal tensions and

underdetermined guidance on non-epistemic values, that may limit some of the uses of research integrity codes, especially for purposes of ethical self-regulation. While codes of conduct cannot be expected to decide how researchers should act in every instance, we do suggest that they acknowledge the challenges of how to integrate non-epistemic values in research in a more explicit fashion.

Keywords
Value-free ideal; research integrity; ethics of research; self-regulation; content analysis; empirical philosophy;

Statement and Declarations

Competing Interests
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While the debate on values in science focuses on normative questions on the level of the individual (e.g. should researchers try to make their work as value free as possible?), comparatively little attention has been paid to the institutional and professional norms that researchers are expected to follow. To address this knowledge gap, we conduct a content analysis of leading national codes of conduct for research integrity of European countries, and structure our analysis around the question: do these documents allow for researchers to be influenced by "non-epistemic" (moral, cultural, commercial, political, etc.) values or do they prohibit such influence in compliance with the value-free ideal (VFI) of science?

Our results return a complex picture. On the one hand, codes of conduct consider many non-epistemic values to be a legitimate influence on the decision-making of researchers. On the other, most of these documents include what we call *VFI-like positions*: passages claiming that researchers should be free and independent from any external influence. This shows that while many research integrity documents do not fully endorse the VFI, they do not reject it and continue to be implicitly influenced by it. This results in internal tensions and underdetermined guidance on non-epistemic values, that may limit some of the uses of research integrity codes, especially for purposes of ethical self-regulation. While codes of conduct cannot be expected to decide how researchers should act in every instance, we do suggest that they acknowledge the challenges of how to integrate non-epistemic values in research in a more explicit fashion.

1 Introduction

The debate on values in science has increasingly left aside descriptive issues (is science value free?) to focus on normative ones (should researchers strive for value freedom?). On the one side of the fence, defenders of the value-free ideal (VFI) of science hold it as a normative ideal to strive for rather than as an accurate description of a current or completely achievable state of affairs (e.g. Betz, 2013; Hudson, 2016; Lacey, 1999; Ruphy, 2006). According to this ideal, researchers should conduct their reasoning as independently as possible from "non-epistemic values" (moral, cultural, commercial, political, etc.)[1]. On the other side, opponents of the VFI not only emphasize that value-free science is not possible, but argue that it is not even a desirable ideal to strive for. The challenge, instead, is to find alternative ideals that do distinguish between the legitimate and illegitimate influence of non-epistemic values (e.g. Douglas, 2009; Kourany, 2010; Longino, 1990) – a challenge which has been called "new demarcation problem" by some (Holman & Wilholt, 2022; Resnik & Elliott, 2023).

In this debate, while norms regarding the role of non-epistemic interests in expert advice and risk assessment have been discussed in detail[2], relatively little attention has been paid to how general formulations of institutional and professional norms deal with the difference between legitimate and illegitimate influence of non-epistemic interests. In particular, to the best of our knowledge, scholars working on values in science have not yet investigated the norms implicit in research integrity documents and codes of conduct. Here, we address this knowledge gap by analyzing the guidance included in leading national codes of conduct on research integrity (RI) of European countries.

Today many research institutions offer various documents on RI, summarizing the principles of research, and defining both what constitutes good practice and what constitutes misconduct. Despite their intrinsic aspirational character, these documents have been gaining increasing importance in science policy and are increasingly viewed as setting the institutional and professional norms of research. In fact, even if one were to be skeptical about whether they guide the actual behavior of individual researchers (e.g. Giacomini et al., 2009), there are a number of other functions that RI documents play in the (self-)regulation of the scientific community. First, in cases of research misconduct, integrity committees (and judges) will use RI documents as consensus statements of professional norms. In cases like these, RI documents are used as (soft) legal documents, and guide judgments on allegations of misconduct (Desmond & Dierickx, 2021a). Second, these documents are the bedrock of RI training programs that are mandatory in an increasing number of PhD programs. In this way, they contribute to setting the professional norms of research by shaping the training of young researchers. In fact, the widespread use of RI documents in PhD training justifies misconduct being viewed as professional negligence (i.e., culpable misconduct, even if committed in ignorance of the standards of RI (see Abdi, Nemery, et al., 2021; Desmond & Dierickx, 2021b).

[1] See Douglas, 2009, Chapter 3 for a historical and conceptual reconstruction of this definition of the VFI.

[2] An anonymous reviewer rightly pointed out that authors like Douglas, Elliott, Betz and John have discussed the norms guiding risk assessment (Douglas, 2000, 2009), wetland banking (Elliott & McKaughan, 2014), chemical regulation (Elliott, 2011), and the various IPCC assessments (Betz, 2013; John, 2015). However, these norms concern the role of researchers as experts aiding policymakers in the application of scientific knowledge. They do not necessarily represent consensus stances on the proper role for values in scientific research.

Third, in addition to these functions that are internal to the scientific community, RI codes and RI policies in general are also meant to have a broader outreach. As openly declared by research organizations, one of the reasons for developing RI policies, including codes of conduct, is that of ensuring the trust of the public (see for instance Science Europe, 2015a, 2015b; World Conferences on Research Integrity Foundation, 2017).

In this way, even though the precise impact on behavior of individual scientists is difficult to empirically verify or even chart, RI documents can be viewed (in various ways) as setting the norms and standards of the decision-making in the course of scientific research. Hence our motivation to look at how these documents are constructed, and to pose the question: what position do these documents take on the role of non-epistemic values in research? Do they follow the VFI in cautioning against all non-epistemic values and interests? Or do they allow for – or even promote – researchers to be influenced by non-epistemic values and interests, and if so, how?

While addressing these questions will not by itself solve the normative dilemmas individual researchers may face (e.g., to disclose a potential conflict of interests even if it may not seem relevant), it may provide new and useful empirical insights to both philosophers of science and RI policy-makers. First, while many alternative ideals to the VFI have been developed, it remains unclear what this concretely means for how research is to be conducted and organized. An assessment of RI documents could be a first step towards translating a philosophical debate into practice, and into terms of what concrete normative guidance researchers should receive. Second, we explore how the values in science debate may offer some conceptual tools for further revisions of RI documents.

In the next section we describe and justify how we selected and analyzed documents. Section 3 presents the identified guidance, together with examples. Section 4 offers an evaluation of the results in the light of the broader academic discussion. In section 5 we highlight some of the strengths and limitations of this study, before offering some concluding remarks in section 6.

2 Methods

We conducted a content analysis of leading national documents on RI of European countries, aiming at identifying and analyzing guidance on the role of non-epistemic values in research.

2.1 Documents selection

We start our analysis from the list of national RI codes of conduct selected in a previous work by HD and KD (Desmond & Dierickx, 2021a). This selection is the product of a thorough identification process, for purposes of international comparison, of a single leading document for each of 32 European countries (27 EU + 4 EFTA + UK), with the choices of the authors further validated by RI experts from each country. This makes the selection particularly apt also for our current purposes as the included documents can be considered representative of the view on RI policies in each country (instead of as a view of a single person or institution).

We amended this list where appropriate by checking for updated versions of the included documents on the official websites of the institutes that released them. Whenever an English version of the document was available, we retrieved it. Otherwise, we translated it into English

using *Google Translate* (HR, LT, PT, RO, SK), with the exception of the Italian document, because JA, who first analyzed the documents, is fluent in Italian.

2.2 Identification criterion

Before presenting the methodology employed, some definitional clarifications are in order. The distinction between epistemic and non-epistemic values on which this study is based has been extensively criticized (Longino, 1996; Rooney, 1992, 2017. But see Steel (2010) and Lacey (2017) for defenses of this distinction). In particular, Phyllis Rooney has argued that at most the distinction is context dependent and that there is no strong border dividing epistemic from non-epistemic values (Rooney, 2017).

Nonetheless, we have operated with this distinction for purposes of the paper, for two reasons. First, even if one assumes that epistemic and non-epistemic values lie on a spectrum, it is still possible to identify those values that are at the extremities of the spectrum. For instance, predictive accuracy and care for the well-being of participants in a study are clear examples of epistemic and non-epistemic values, respectively. In this sense, it is plausible to assume *some* distinction between epistemic and non-epistemic values, even if it may be unclear or controversial where precisely this distinction lies. Second, given this broad plausibility, we operationalized the distinction by means of a clear identification criterion. This is not intended as a definitive account of the distinction between epistemic and non-epistemic values, but as a way to make the research methodology transparent.

Based on the definitions in Kuhn (1977) and Steel (2010) we understand "epistemic values" to refer to the features of a theory which reliably guide to truth. Conversely, "non-epistemic values" refer to all other values and factors potentially influencing the work of researchers that are not epistemic. This will form the basis of how we will analyze RI documents.

One important implication of this definition is that a very broad range of values will be considered as "non-epistemic". For instance, let us consider honesty. Honesty is undoubtably related to truth (after all being honest implies, at the least, not lying), and thus can be considered an epistemic value. However, honesty has also a moral component, inasmuch as it can be considered a moral trait or virtue of a researcher. For this reason, we consider values like honesty to be non-epistemic.

Additionally, other sorts of non-epistemic "factors" (economic interests, personal beliefs…) may influence research (Biddle, 2013). For this reason, we assume a very broad meaning of "value" as including all interests and non-epistemic considerations that could influence researchers. This is why also "conflicts of interest" were termed "non-epistemic value", even though the conflict itself is of course not a value, but rather points to the presence of a non-epistemic value.

2.3 Data identification, characterization, and analysis

We performed an inductive content analysis following Erlingsson and Brysiewicz (2017) and Vears and Gillam (2022). We did not start our analysis with a codebook at hand, deductively applying pre-made categories. Rather, our codes were inductively built from what we found in the documents, i.e., guidance on the non-epistemic values actually mentioned there. At the

same time, our analysis was not only inductive as the data retrieved had to match our definition of non-epistemic value, which in turn was applied deductively.

We searched the selected documents on RI for passages offering guidance on the influence of non-epistemic values independently of the specific activity at stake. We only excluded those sections of RI documents dealing with how to run investigations on possible cases of misconduct (e.g. who is supposed to run the investigations; how to notify the researcher suspected of misconduct; their rights; the rights of whistleblowers, etc.). We did so as those sections fall outside our present aim, i.e. identifying guidance on non-epistemic values aimed at researchers.

After reading the documents multiple times, we identified data directly in the texts by highlighting "meaning units" (following Erlingsson & Brysiewicz, 2017), i.e., passages expressing guidance on non-epistemic values. Then, we summarized meaning units into "condensed meaning units" (also following Erlingsson & Brysiewicz, 2017). Concretely, this meant that we rephrased the original text with fewer words while maintaining the original meaning. We then attached to these units a code representing the non-epistemic values at stake. Finally, we further analyzed our data according to how the influence of the values is judged (e.g. legitimate or illegitimate).

For the sake of simplicity, we employed a course-grained coding strategy: in order not to end up with an unnecessarily high number of codes, when possible we preferred to code different pieces of guidance according to slightly broader types of non-epistemic value (e.g. we coded "political pressure" and "political ideology" under "politics").

JA first performed data identification, characterization, and analysis. HD and KD independently reviewed each step of these passages, and all authors revised the steps. Dubious cases were discussed until agreement was reached. A full disclosure of the identified data together with an example of the methodology employed is available online.

3 Results

3.1 Selected documents

Of 32 countries considered, HD and KD (Desmond & Dierickx, 2021a) had identified a leading national document for 24 countries. We replaced 3 documents with their updated version (CH, ES, IE) and added the *European Code of Conduct for Research Integrity* (ESF-ALLEA, 2017), because it was identified as the leading national document for 3 countries (BG, LU, SI). The total number of analyzed documents is 25. The complete list of analyzed documents—last updated on 23rd May 2023—is available in the online supplement.

3.2 Guidance on non-epistemic values

The identified passages are divided into three groups according to how they judge the influence of the non-epistemic value at stake:

1. passages considering *legitimate* the influence of the value at stake;
2. passages considering *illegitimate* the influence of the value at stake;
3. passages requiring *disclosure* of the value at stake.

As shown in figure 1, these are not always mutually exclusive options. In particular, some values are sometimes asked to be disclosed and sometimes to be avoided (as illegitimate).

The variety of guidance reflects the broad scope of the analyzed documents. While all the documents deal with the planning, conducting, and dissemination of research, many of them offer guidance on other aspects of the professional life of researchers. These aspects include: the evaluation of others during the hiring process; reviewing journal article submissions and grant proposals; communication with non-researchers; and the personal and professional relations with others in academia.

In what follows we offer an overview of the identified guidance divided by type (*legitimate influence*, *illegitimate influence*, *disclosure*) with some examples illustrating how different pieces of guidance interact with each other.

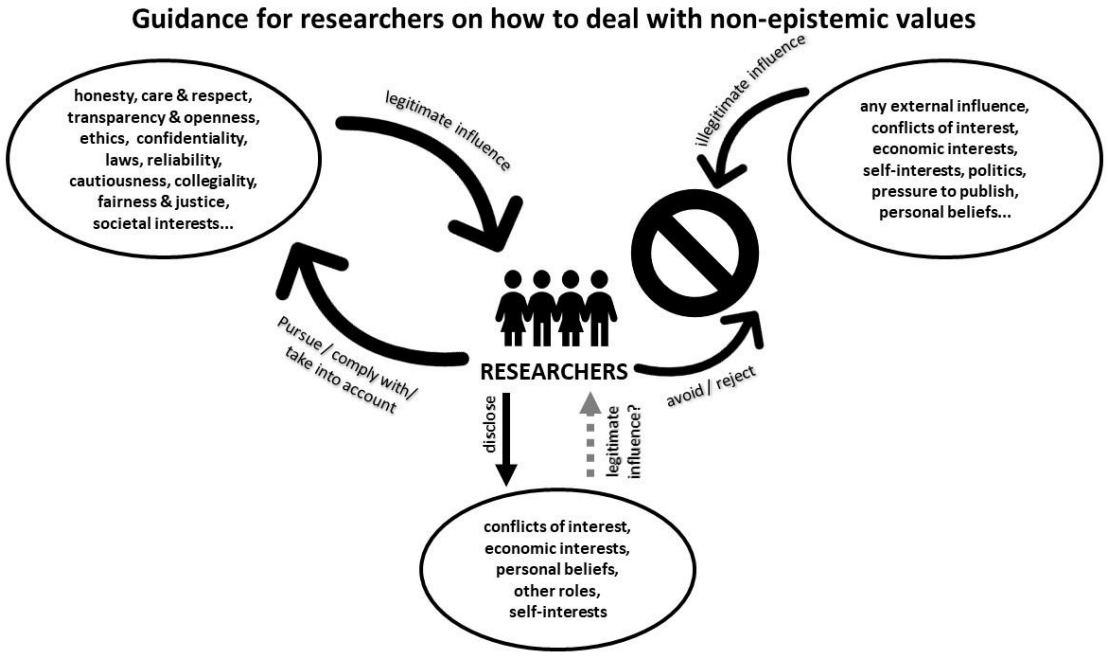

Figure 1 Graphical overview of the guidance on how to deal with non-epistemic values found in 25 national codes of conduct for research integrity of different European countries. Some values appear more than once in the graph: for instance, conflicts of interest are required to be avoided in some passages, and to be disclosed in other passages, in some case even within the same document.

Table 1 Non-epistemic values whose influence is considered *legitimate* by the analyzed documents, ordered by descending frequency. The influence of these values is considered legitimate to different extents, ranging from being tolerated (e.g. *economic interests*), to being actively promoted (e.g. *societal interests*).

Non-epistemic values	Documents judging the influence of the value to be legitimate
honesty	24 AT, BE, CH, CZ, DE, DK, EE, ES, EU, FR, HR, HU, IE, IT, LT, LV, NL, NO, PL, PT, RO, SE, SK, UK
care & respect	22 BE, CH, CZ, DK, EE, ES, EU, FI, FR, HR, HU, IE, IT, LT, LV, NL, NO, PT, RO, SE, SK, UK
transparency & openness	17 AT, CH, DK, EE, ES, EU, FI, FR, HU, IE, IT, NL, NO, PL, PT, SE, UK
ethics	16 BE, CH, DE, DK, EE, ES, EU, FI, HR, HU, IE, IT, LV, PT, RO, UK
confidentiality	15 CH, CZ, DE, ES, EU, FR, HR, IE, IT, LT, LV, NO, RO, SK, UK
laws	13 CH, DE, EE, ES, EU, FR, HR, HU, IE, LV, NO, RO, UK
reliability	12 AT, BE, CH, ES, EU, HU, IE, IT, NL, PT, SE, UK
cautiousness	12 BE, CH, DE, EE, ES, EU, HU, IE, IT, NL, NO, SE
accountability	12 BE, CH, CZ, DK, EE, ES, EU, FR, HR, IE, PL, PT, UK
collegiality	10 CH, DE, EE, ES, HR, IT, LV, NO, PL, SE
fairness & justice	9 AT, DE, EE, ES, HR, LV, NO, PL, SE
societal interests	8 CZ, EE, FR, LV, NL, NO, PT, SK
economic interests	8 BE, CZ, EE, ES, IT, NL, NO, SE
other moral principles	4 CZ, FR, IT, LT
diversity	4 DE, ES, EU, IE
self-interests	3 IT, LV, SE

3.2.1 Legitimate influence of non-epistemic values

The analyzed documents assign a legitimate role to a number of non-epistemic values (listed in Table 1). These are the values that researchers should pursue, take into consideration, comply with, be guided by, or whose influence is considered to some extent legitimate, and therefore tolerated. In most of the cases these are the principles of RI explicitly mentioned

and endorsed by the documents: *honesty*, *care & respect*, *transparency & openness*, *accountability* etc. Sometimes a document listed a general requirement to comply with high ethical-professional standards: this was coded as *ethics*.

In some cases, the value was extracted from the formulation of some norm. For instance, a passage of the German document stresses that researchers should not be evaluated just for their research outputs, but also for considerations such as "involvement in teaching, academic, self-governance, public relations, and knowledge and technology transfer" (German Research Foundation (DFG), 2019, p. 12). This we analyzed as expressing an endorsement of the value of *collegiality*, as it implies that researchers should be rewarded, among other things, for their cooperative interactions with colleagues.

Many documents (13) state that researchers must comply with national and international legal regulations (*laws*). Eight documents explicitly require researchers to consider *societal interests* either in the choice of the research topic, or more generally by striving to benefit society. For instance, the Norwegian document asks researchers to "seek to ensure that their activities produce good consequences […]"(The Norwegian National Research Ethics Committees, 2019).

The Czech, Estonian, Spanish, and Italian documents require researchers to consider *economic interests* inasmuch as they ask to use resources efficiently and with no waste. Other documents (BE, NL, NO, SE) state that the interests of funding bodies should be, within reasonable limits, taken into consideration by researchers. For instance, the Belgian document grants that the "sponsor's policy (public or private) is expressed in the choice of research themes" while leaving to researchers alone choices on methodology, organization and formulation of conclusions (Royal Flemish Academy of Belgium for Science and the Arts, The Royal Academy of Science, Letters and Fine Arts of Belgium, 2009, p. 9).

As regards the legitimacy of one's *self-interests,* the Italian, Latvian and Swedish documents allow for the interests in one's career and intellectual property to play some role. For instance, the Latvian document states that a researcher "has moral and legal rights to defend their discovery and the copyright on the innovation" (Latvian Academy of Science & Latvian Council of Science, 2017).

Finally, four documents stress the importance of promoting *diversity*, understood as real or perceived differences in gender, age, nationality, race, religion, marital status, sexual orientation, opinion, or other conditions. The German and Spanish documents require diversity to be promoted and considered, especially in the hiring process. The European and Irish documents require considerations about diversity to play a role in the choice of methodology: "Research protocols take account of, and are sensitive to, relevant differences in age, gender, culture, religion, ethnic origin and social class" (Irish Universities Association (IUA) et al., 2019, p. 16).

3.2.2 Illegitimate influence of non-epistemic values

The analyzed documents prohibit a number of non-epistemic values from influencing researchers, especially in the choice of methods and in conducting research. These values

(listed in table 2) should be avoided or rejected by researchers who can be asked to withdraw from the specific activity at stake if only suspected of being influenced by them.

Table 2 Non-epistemic values whose influence is considered *illegitimate* ordered by descending frequency. The influence of some of these values may be considered outright illegitimate by some passages of a given document, or just to be disclosed by different passages within the same document.

Non-epistemic values	Documents judging the influence of the value to be illegitimate
any external influence	17 BE, CH, CZ, DK, EE, ES, FR, HR, HU, IT, LT, LV, NL, NO, SE, SK, UK
conflicts of interest	16 BE, CZ, DK, EE, ES, EU, FI, FR, HR, IE, IT, LT, LV, NO, SE, SK
economic interests	12 CH, DK, EE, EU, FR, HU, IE, IT, LV, NL, NO, SE
self-interests	11 BE, CZ, EE, ES, FR, HU, IT, LT, LV, SE, SK
politics	10 CZ, EU, FR, HU, IE, LV, NL, RO, SE, SK
pressure to publish	6 BE, ES, HU, IT, RO, SE
personal beliefs	6 BE, CZ, HU, LV, SE, SK
diversity	6 CH, DE, EE, ES, FR, SK
other roles	4 IT, LV, NO, SK
religion	3 CZ, FR, SK
societal interests	1 SE

The majority (17) of the documents contains passages deeming *any external influence* illegitimate. The passages coded under this label are those stressing the freedom and independence of researchers. For instance, the Danish document states that "Freedom of research implies the right to freely define research questions, choose and develop theories, gather empirical material and employ appropriate methods." (Danish Ministry of Higher Education and Science, 2014, p. 4). These passages express what we will call *VFI-like positions* for their close resemblance to the VFI. Other passages endorsing VFI-like positions limit their restrictions to specific types of values, such as *politics* and *economic interests.* For instance the *European Code of Conduct for Research Integrity* states that research "ideally develops independently of pressure from commissioning parties and from ideological, economic or political interests" (ESF-ALLEA, 2017, p. 3).

Seven documents considering any external influence to be illegitimate (CZ, EE, FR, LV, NL, NO, SK) also ask researchers to pursue socially relevant goals (see 3.2.1). For instance, the Czech document asks researchers to completely observe "the principles of neutrality and independence of ideological and political pressures and of the interests of pressure groups",

and at the same time to make "every effort to ensure that his/her practically usable research results serve society" (Academy of Sciences of the Czech Republic, 2016).

Conflicts of interest are universally depicted as possibly problematic. Researchers are always recommended to either disclose them (see 3.2.3) or to completely avoid them, even if this means to stop the ongoing activity (research, peer-reviewing, expert advice, etc.). According to some documents, mere suspicions of a conflict of interest warrant withdrawal: "Researchers refrain from all research-related evaluation and decision-making situations, when there is reason to suspect a conflict of interest."(Finnish Advisory Board on Research Integrity, 2012, p. 31). In other documents, researchers are asked to evaluate themselves whether the suspected conflict of interest warrants withdrawal. For instance, concerning the evaluation of other researchers, the French code states that researchers "must step down if they consider that a conflict of interest may jeopardise their impartiality." (CNRS-CPU, 2017, p. 20).

The values of *collegiality* and *care & respect* (3.2.1) are often translated into negative recommendations on using *diversity* as a basis for discrimination. While the pieces of guidance on diversity described in section 3.2.1 are aimed at promoting diversity as something desirable to be pursued, the passages included here consider it to be illegitimate to discriminate colleagues because of their diversity, i.e., their (real or perceived) differences in gender, age, nationality, etc. For instance, the Swiss document judges it to be a type of scientific misconduct to "[display] any form of harassment or discrimination, especially when based on cultural, socio-demographic, or other personal characteristics or professional background" (Swiss Academies of Arts and Sciences, 2021, p. 24).

The one document that limits the impact of *societal interests* does so not in order to preserve epistemic integrity but due to priority given to the welfare of individual human beings that may be affected by research: "The welfare of human beings should be placed before the needs of society and science"(Swedish Research Council, 2017, p. 31). In this case, values such as care and respect for the participants of a study trump the possible positive effects for society at large.

Table 3 Non-epistemic values that are requested to be disclosed ordered by descending frequency. It is not always clear whether the influence of these values should be considered legitimate once they have been disclosed.

Non-epistemic values	Documents asking for disclosure of the value
conflicts of interest	18 AT, BE, CH, DE, DK, EE, ES, EU, FI, FR, HR, IE, IT, NL, PL, RO, SE, UK
economic interests	14 AT, BE, CH, DK, EE, ES, EU, FI, HU, IE, IT, NL, NO, SE
personal beliefs	2 CZ, FR
other roles	2 NL, SK
self-interests	1 EE

3.2.3 Disclosure of non-epistemic values

If a possibly problematic non-epistemic values need not be avoided or rejected outright, it still may need to be disclosed. The presence of a potentially problematic non-epistemic value is often termed a "conflict of interest", and hence the latter category can be viewed as referring to a wide range of potentially problematic non-epistemic values, even though these are often not specified by the documents. Table 3 gives an overview of the various values or factors that need to be disclosed. In a sense, the provisions asking for disclosure can be viewed as an operationalization of the values of *transparency & openness* (see Table 1).

Most of the documents (18) require researchers to disclose *conflicts of interest* while involved in different activities, including conducting research, giving opinions in capacity of experts, communicating with the public, and evaluating the work of others:

> Any real, apparent or potential conflict of interest that could unduly influence or compromise the proper execution and undertaking of scientific activity in its various dimensions, the protection and dissemination of its results and/or the management of research must be declared. (Consejo Superior de Investigaciones Científicas, 2021, p. 55)

Likewise, 14 documents require the identity of the funders or commissioners, any role they might have played, as well as any economic or financial interests researchers may have, to be disclosed (*economic interests*).

Possible tensions within a document arise from requirements to both disclose and to avoid potentially problematic influences. For instance, the Italian document explicitly requires to avoid conflicts of interest when possible, and proposes disclosure as the second best option (Commissione per l'Etica della Ricerca e la Bioetica del CNR, 2015, p. 7).

In general, the analyzed documents do not always specify to what extent an interest can influence researchers after disclosure, nor whether such an influence should be considered legitimate. In particular, some documents explicitly present disclosure of conflicts of interests as the first step towards the evaluation and management thereof: "Researchers will […] declare and act accordingly to manage conflicts of interest" (Universities UK, 2019, p. 13). In

these cases, researchers themselves are required to evaluate the legitimacy of their own conflicts of interests. Similarly, the Estonian document specifies:

> The researcher assesses critically the impact of the conflict of interests on his/her own and the colleagues' decisions, taking into consideration that not all the conflicts have an inappropriate influence on decisions. (the Estonian Academy of Sciences, the Estonian Research Council, and the Ministry of Education and Research, 2017, p.19)

4 Discussion

Should researchers try to make their work as value-free as possible? Under what conditions should the influence of non-epistemic values be considered legitimate? While the debate on values in science focuses on general answers to these questions, in this study we ask how scientific institutions and scientific bodies formulate answers in practice.

Our results return a complex picture. Many non-epistemic values are allowed to influence the decision-making of researchers (3.2.1); however, many RI documents are wary of them and contain provisions that limit or prohibit their influence on research (3.2.2). As a result, different pieces of guidance even within the same document may be in tension with each other. In addition to this, sometimes codes of conduct may neither endorse nor prohibit a particular non-epistemic value or interest, but merely prescribe the researcher to disclose its presence. Such passages prescribing disclosure raise questions in particular, because researchers receive little guidance on how they should deem whether some non-epistemic value is appropriate or not.

In this section, we discuss how there is no general stance on the VFI across RI documents (4.1), and we reflect on what this means for the aims of RI policies (4.2). Finally, we suggest potential paths forward, and in particular how the values in science debate in the philosophy of science could contribute to the development of RI policies (4.3).

4.1 Do research integrity codes endorse the value-free ideal?

Most of the documents include what we call VFI-like positions: passages claiming that researchers should be free and independent from any external influence (see 3.2.2). For instance, according to the Swedish document the work of researchers "must be free of external influence and manipulation […]." (Swedish Research Council, 2017, p. 10). At the same time, RI documents contain passages allowing for a range of non-epistemic values to play some role in research. This role varies from a normative requirement (e.g. requiring researchers to be guided by non-epistemic values), to pointing towards options (e.g. allowing researchers to consider some non-epistemic interests) (see 3.2.1).

Such passages raise questions about the precise status of the VFI in RI documents. Do they implicitly reject the VFI, and therefore are in contradiction with the VFI-like positions endorsed by the same documents? Or are these non-epistemic interests viewed as incidental to the VFI? To answer these questions, it is important to point to some clarifications and distinctions.

The first is that the VFI does not ban non-epistemic values altogether from science, but rather requires researchers to strive to keep non-epistemic values out of the "epistemic phase" of research – sometimes referred to as "the justification of scientific findings" (Betz, 2013, p.

207), "evidential reasoning" (Hudson, 2016, p. 190), or the production of "the very *content* of scientific knowledge" (Ruphy, 2006, p. 190). Outside this "epistemic phase", the influence of values is not considered problematic per se. Even defenders of value-free science acknowledge that values may play a legitimate role in, for instance, "the definition of research programs, in the choice of questions deemed scientifically interesting, in the way scientific results might be applied, etc." (Ruphy, 2006, pp. 189–190). RI documents contain many provisions on activities outside the "epistemic phase" of science (e.g., topic choice, science communication, etc.). Thus, that RI documents allow for some role to be played by non-epistemic values in such activities does not imply a rejection of the VFI.

A second group of recommendations to be singled out are those asking researchers to be guided by non-epistemic values. For instance, according to the Estonian document a researcher "strives for social benefits and acts for the good of humankind" (the Estonian Academy of Sciences et al., 2017, p. 11). Considering that challengers of the VFI use the social responsibilities of researchers and the social goals of research as reasons to *undermine* the VFI (e.g. Bueter, 2015; Drenth, 2006; Kourany, 2010; Lekka-Kowalik, 2010; Resnik & Elliott, 2016), one may view passages like this as *de facto* deviations from the VFI, and potentially implicit rejections of the VFI. Furthermore, these passages are also in apparent tension with other passages within the same documents that do seem to endorse VFI-like positions. For instance, the Estonian document prescribes researchers to act "for the good of human kind" and elsewhere in the document to be completely "free to choose the research problem or hypothesis" (the Estonian Academy of Sciences et al., 2017, p. 8).

Finally, many pieces of guidance concern activities that cannot be easily categorized as either part of the epistemic or pre/post-epistemic phases of research. This reflects a general problem with this segmentation of research. For instance, decisions taken in early stages of research (i.e. research planning) can have "ripple effects" affecting the justification of scientific claims too (Elliott, 2017; Elliott & McKaughan, 2009). As a concrete example, consider how sometimes the interests of the commissioners (coded as *economic interests*) are explicitly allowed to influence certain activities:

> the commissioning agency has the right to define the topic, research questions and scope of the research assignment in cooperation with the person or institution undertaking the assignment. (The Norwegian National Research Ethics Committees, 2019)

What is the implied stance on the VFI? While the influence of non-epistemic interests in the choice of topic is consistent with an endorsement of the VFI, deciding the scope of research seems to already imply some methodological choice, which in turn would affect the conditions under which a hypothesis is accepted or not. Thus, one could argue that such decisions by the commissioning agency are not entirely to be situated within the "pre-epistemic phase" of research. If this is the case, the passage implies some partial rejection of the VFI.

The mismatch between the lexicon employed by RI codes directed to researchers and the philosophical jargon seems to confirm the limits of the distinction between epistemic and non-epistemic (pre/post) phases of research: while it can be useful for analytical purposes, it is not suitable for application in real-world research (Hicks, 2014). In addition to this general claim, our results show that this distinction is particularly ill-suited for the purposes of RI policies.

Thus, if conceptual work in philosophy of science is to contribute to RI policies (as discussed below in 4.3), the development of a more precise taxonomy of the various phases of research and their relations is desirable.

To sum up, while most of the documents officially endorse some form of VFI-like positions, most also contain passages that require researchers to be guided by non-epistemic values in a way that does not seem compatible with the VFI. This complicated stance on the VFI suggests that the authors of RI codes recognize the limits of the VFI but do not want to eliminate its role altogether. This is possibly because the goals that the VFI was historically meant to achieve, including, for instance, contributing to the authority of scientific research (see e.g., Gieryn, 1999), partially overlap with the goals of RI policies. Nonetheless, one should ask whether the core social functions of RI codes are threatened by some of these tensions or even apparent contradictions. The next subsection explores this issue.

4.2 What are the limits of the lack of a clear general position on values in science?

4.2.1 Is there a risk to public trust?

As clearly stated by international research organizations (Science Europe, 2015b, 2015a), and RI organizations (World Conferences on Research Integrity Foundation), one of the core functions played by RI policies is to contribute to safeguarding public trust in science. Similarly, as hypothesized by a range of contributors (e.g. Bright, 2018; Hudson, 2016; John, 2015; Koertge, 2000), the VFI has a communicative function of conveying that the scientific community prioritizes eliminating bias, and in this sense contributes to safeguarding public trust in science. The passages deviating from the VFI could be argued to risk this function. For instance, knowing that pharmaceutical studies are very likely to produce results that are favorable for the companies who commissioned them (Smith, 2005), members of the public may view with suspicion the legitimate (albeit limited) role that RI documents grant to the interests of funders and commissioning agencies. As a matter of fact, European citizens already tend to trust scientists less when economic and political interests are perceived to be involved (European Commission, 2021).

Much research is yet to be done in order to properly assess the relationship between RI policies and the perception that the public has of scientific research. One should not think of this relationship as a direct causal link, since RI policies have a complex relationship to actual patterns of research behavior and potential misconduct. However, given that public trust may depend on perceived bias of scientists, it is tempting to conjecture that a more thorough endorsement of the VFI in RI documents could contribute to public trust. However, even if true, this would not imply that an endorsement of the VFI would actually make science less biased, but simply change *perceived* bias. This connects closely to an ongoing controversy in the philosophical debate, where some consider value-free science tantamount to bias-free science (Hudson, 2021, 2022), whereas others maintain that allowing for some non-epistemic interests to influence research does not necessarily entail a problematic bias (e.g. Douglas & Elliott, 2022). If the latter view were right, it would raise the question of whether an institutional endorsement of the VFI as "a useful fiction" (Ambrosj et al., 2023) to promote public trust would be in contrast with the principles of honesty and transparency endorsed by many RI codes (3.2.1).

Therefore, considering both the possible need to deviate from an unconditional endorsement of the VFI and its strong communicative function, in order to safeguard public trust, deviations from the VFI must be treated with more care, and must be explained just how they cannot be taken as opportunities to justify biased and untrustworthy research. In their current status, the analyzed RI codes do not offer such clear explanations.

4.2.2 Is the self-regulative function undermined?

In addition to public trust, the lack of a clear position on the role of values in science risks another core sociological function played by RI documents, i.e., to be an instrument of self-regulation, including both ethical self-regulation at the level of the individual well as professional self-regulation at the level of community (Desmond, 2020). When RI codes are used as legal documents[3] during investigations on alleged cases of misconduct, contradictory statements could undermine such use. From this perspective, it is unsurprising that the exact definition of serious cases of research misconduct tends to vary little across national contexts (Desmond & Dierickx, 2021a). When it comes to more nuanced issues, such as determining whether a particular conflict of interest was legitimate or not, lack of clear criteria would make it difficult to judge whether a researcher's behavior complied or not with the document. However, while such a lack of clarity would seem to preclude the use of such provisions in a legal context, such provisions may still be very useful for self-regulation.

This is particularly the case for those passages requiring researchers to decide for themselves whether the influence of non-epistemic values is legitimate or not. Researchers are required to do so when they are asked to decide if the influence of some non-epistemic factor is *serious enough* for them to interrupt the activity at stake (see 3.2.2), and when they are asked to *evaluate and manage* their own conflicts of interests in a critical way (see 3.2.3). We call this *open guidance*: researchers are asked to be wary of the influence of those values, but are not provided with criteria to determine whether such an influence is legitimate or not.

Open guidance stems from the lack of a univocal position on the influence of values in science highlighted in the previous subsection (4.1): in the absence of clear guidance on the subject, researchers themselves are bound to make some decisions by themselves. This may strengthen the *professional autonomy* of researchers, inasmuch researchers are granted the discretion to choose themselves the appropriate response to the challenges they face in their work (Desmond, 2020; Freidson, 2001). Moreover, the leeway granted to researchers can be viewed as beneficial from the point of view of those developing RI policies. In fact, it helps RI documents to be flexible tools in aiding ethical deliberation. If RI codes would attempt to provide an exhaustive list of "do's and don'ts", not only would the resulting list likely fail to be exhaustive, but it would also fail to communicate the importance of self-regulation in RI. To better appreciate this, it is worth contrasting the open guidance identified in the documents and its flexibility to the alternatives to the VFI developed by philosophers of science. These

[3] As noted by an anonymous reviewer, the analyzed documents vary in terms of their legal status. In particular, some may be more directly connected to their country's legal system than others. In turn, this can influence how they are employed as legal documents. The different status and intended use of these documents have already been discussed in the study we built on (Desmond & Dierickx, 2021a). Therefore, we refer the readers who want to know more about these aspects of RI to that article.

alternative ideals tend to be based on "a single philosophical distinction" (Resnik & Elliott, 2019), which makes them subject to many practical counterexamples (for overviews of these see Biddle, 2013; Elliott, 2022; Holman & Wilholt, 2022; Resnik & Elliott, 2019, 2023). By not being based on a single philosophical distinction, RI documents could provide researchers the practical and flexible guidance that alternative ideals of science lack (Resnik & Elliott, 2019).

Nevertheless, open guidance can only work when the ensuing individual deliberation respects a standard of reasonableness. In this sense, some prescriptions about non-epistemic values could potentially be misused or misinterpreted as to justify acting in a way that fails such standards of reasonableness. For instance, consider the following passage of the Italian document:

> Conversely, to carry out actions that hinder or slow down the activity of colleagues does not amount to sabotage in case such actions are aimed to safeguard one's own legitimate interests (Commissione per l'Etica della Ricerca e la Bioetica del CNR, 2019, p. 15)[4]

This seems to imply that a researcher *may* hinder the work of colleagues when their interests are *legitimate*. This would not only have consequences at the level of the personal relationships between colleagues, but it would also have epistemic consequences since it would imply that one's legitimate interests can impact the research work of others. For instance, imagine a researcher withholding data from a colleague with whom they had agreed to collaborate. The colleague could proceed drawing conclusions from an incomplete set of data and even publish their conclusions in a major scientific journal. However sound these conclusions may be, they would be affected by the absence of possibly relevant data. As a consequence, other researchers in the field could base their future work on an incomplete and thus possibly flawed piece of knowledge.

Unfortunately, the Italian document is silent on how to distinguish between legitimate and illegitimate interests in this case, though this may affect the quality of research. Different researchers complying with the same document may hold different views of what counts as a legitimate or illegitimate interests, thus leading to different courses of action. Moreover, in case of an investigation on an alleged case of misconduct, to determine whether or not a researcher complied with the guidance would not only depend on how different researchers evaluate the legitimacy of the interests at stake, but also on how different members of an investigating committee evaluate such interests. In other words, in the absence of a univocal view on values in science, this evaluation rests on the views on values in science held by single researchers and investigators.

Indeed, the autonomy and flexibility granted by the open guidance may accurately reflect the fact that any finite set of rules may not be able to decide beforehand how a researcher should act. In this way, a lack of clear criteria for distinguishing between legitimate and illegitimate interests need not necessarily undermine the self-regulative function of RI documents. Even so, one should consider the risk that some passages can be used to support action that goes in against reasonable standards of RI.

[4] JA's translation from Italian: "Non configura viceversa sabotaggio mettere in atto azioni che ostacolino o rallentino l'attività di colleghi qualora tali azioni siano finalizzate alla difesa di propri legittimi interessi"

4.3 Potential ways forward

In this paper we wished mainly to draw attention to a problem or challenge present in codes of conduct: a lack of clear guidance for researchers on how to integrate non-epistemic values in their research. We do not pretend to have an answer, partially because the tradeoffs when authoring codes of conduct are so complex that there are many ways in which these codes can be designed, depending on what purpose one wishes to emphasize (e.g., legal clarity, or training value, ethical self-regulation, or safeguarding public trust). As discussed in the previous section, not all of these functions require the codes to give definitive answers to the new demarcation problem (Holman & Wilholt, 2022; Resnik & Elliott, 2023), i.e. the problem of how to distinguish between legitimate and illegitimate influence of non-epistemic values.

Nevertheless, one should notice that without further guidance researchers will face difficult decisions on which non-epistemic values to avoid and which to integrate, and how to integrate them. Perhaps codes of conduct could acknowledge the problems facing the VFI while simultaneously stressing the importance of not altogether rejecting it (at least in some phases of research, such as formulation of conclusions, or for some specific sets of values, such as commercial values). Science cannot and perhaps should not be independent of wider societal values and concerns; at the same time, one should also be aware that non-epistemic values and interests *can* bias research outcomes. Thus, striving to achieve a fair and balanced understanding of a phenomenon is and remains important and implies some type of independence from at least commercial and political values. This remains a difficult and delicate issue (especially considering that much scientific research today is funded by private companies), and by even just acknowledging it as such, codes of conduct could communicate to researchers that it is an issue to be approached with care.

Further, we would like to sketch how conceptual work in philosophy of science could potentially contribute to increased clarity on this issue. One potentially worthwhile contribution would be to develop a more precise taxonomy of different phases of research to allow for more precise judgments on which research activities can be opened up to influence by non-epistemic values. This would be something that philosophy of science could provide, while also being informed by how the authors of RI documents tend to segment research activities.

For instance, consider the VFI-like position endorsed by the Dutch document which asks researchers to

> Make sure that the choice of research methods, data analysis, assessment of results and consideration of possible explanations is not determined by non-scientific or non-scholarly (e.g. commercial or political) interests, arguments or preferences. (Koninklijke Nederlandse Akademie van Wetenschappen (KNAW) et al., 2018, p. 17)

This VFI-like position forbids the influence of non-epistemic values from specific research activities. Thus, a taxonomy of the various phases of research should at least include those activities. In addition to this, a philosophically informed analysis should critically evaluate this segmentation.

As mentioned above, choices made in early stages of research including choices of research design could have a "ripple effect" (Elliott, 2017), for instance, on the choice of research methods, and in turn, data analysis. Hence, when the Dutch document asks researchers to consider "the interests of […] society when determining the subject and structure" of research (*Ibidem* p. 16), then this is more in tension with the previous provision that perhaps is intended by the authors of the document. Such considerations suggest that, if the aim of endorsing a VFI-like position is to avoid as much as possible that methodology is influenced by non-epistemic considerations, then guidance on the structure of research phases should be different, or at least more precise.

This is just a cursory example, but it does point to how conceptual work could and perhaps should have consequences for how the norms of the scientific community are formulated in RI policy. As an additional consequence, the debate in the philosophy of science could benefit, since the adequacy of various conceptual accounts could be (partially) evaluated according to whether their implications for RI policy seem plausible or desirable.

5 Strengths and limitations

To our knowledge this is the first study aiming at identifying the stance on the role of non-epistemic values assumed by research institutions and organizations, as formulated by RI codes of conduct. We aimed to map current guidance on how to deal with non-epistemic values, and to reveal some problematic issues inherent in current RI documents. At the same time, it is fair to point to some limitations.

First, this study is limited by the interpretative decisions inherent in qualitative methods. For instance, had we employed a fine-grained coding strategy, we would have produced more codes, possibly resulting in a more detailed picture. We tried to reduce the possible limitations coming from this simplification by coupling our tables with rich textual explanations in the result section. Moreover, while fine-grained coding strategy would have changed the map of non-epistemic values, it would not have affected the most important takeaways of this study, for instance the presence in RI documents of conflicting guidance on whether to avoid or disclose conflicts of interest. Our data together with an example of the coding process are available online.

Second, one may say that the importance of RI documents is overestimated, since individual researchers may be unaware and/or indifferent to official RI guidelines beyond some basic commitment to avoiding fraud (Godecharle et al., 2018; Martinson et al., 2005). This may well be true, but, as stressed in the introduction, RI codes contribute to shape the way research is organized and conducted via their multiple functions, and therefore the norms they provide should not be seen only as individual norms, but rather as collective norms, endorsed by the scientific community. In addition to this, a recent study shows that education on RI leads to a small yet significant improvement of PhD students' knowledge on RI and alignment of moral attitudes with RI principles (Abdi, Fieuws, et al., 2021). This notwithstanding, even if future research showed that individual researchers hold very different views on values in science, a comparison with our results would prove fruitful for deciding how to change and improve current policies.

Another limitation may come from the kind of documents we selected. Because of their aims and intended audience, codes of conduct on RI mainly focus on stating the general aspirational principles of RI. Other kinds of documents may endorse different approaches. For instance, Horbach and Halffman, studying a larger set of documents, identified an increasing tendency for RI policy documents to focus more on practical and specific rules rather than on stating general aspirational principles (2017). Indeed, to run a study similar to ours on rule-based documents could identify more detailed and discipline-specific guidance on how to deal with non-epistemic values, than the one here identified. However, it would still be interesting to compare the results of such a study, with the results presented here.

6 Conclusions

This study shows that while *de facto* many codes of conduct for research integrity (RI) deviate from a full endorsement of the value-free ideal (VFI), the ideal still has a certain appeal when it comes to guide researchers in maintaining RI. However, this results in sometimes contradictory and underspecified guidance on how to deal with non-epistemic values, in such a way that may undermine the aims of RI codes, including in their application as ethical and legal documents.

We suggest that because of the specific professionals they are addressed to (i.e. scientific researchers), RI documents should pay more attention to the fundamental epistemic issues raised by the influence of values in science. How to include these epistemic considerations in such a way to avoid internal tensions, and at the same time keeping the flexibility that is proper to codes of conduct is a complex task that should be addressed with a joint effort by both researchers working on RI and values in science. By collaborating in the development of RI policies, philosophers of science could realize their own wish to have a greater impact outside the boundaries of their discipline (Plaisance, Graham, et al., 2021; Plaisance, Michaud, et al., 2021). If any, RI is the policy-making area that can instantiate and put into practice different views developed in the values in science debate.

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