

Research Ethics in the Digital Age: Fundamentals and Problems

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Abstract

This paper outlines different readings of the term research ethics and presents the approach of integrated research ethics. This approach steps beyond an understanding of research ethics as applied ethics and calls for the development of ethics frameworks not within the classical structures, i.e. in theology or philosophy departments, but organized in a post-departmental interdisciplinary structure.

Table of Contents

1	Introduction	8
2	Fundamental questions concerning research ethics	9
3	Problems in research ethics	11
4	Problems with interdisciplinarity.....	14
5	The digital age.....	16
6	Research ethics – an impairment to progress?.....	17
7	The integrated approach to research ethics in the digital age	18
	References.....	19

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1 Introduction

Research, science, and scholarship play a prominent role in our society – a role which is becoming more and more important. However, of all the endeavors and projects that take place in the scientific community, only a small amount is noticed by the public. Major breakthroughs and scandals are headline material for newspapers; most of the scientific and scholarly work – be that great results or failures – will only be noticed by fellow scholars, even though it might be contributing to developments which are undesirable for the public. Efficient control over research activities is not possible for individuals within a society. But still people place trust in those who are engaging in research activities. This trust can, at least partly, be attributed to research ethics.

Universities, colleges, profit and non-profit research organizations, as well as companies, are places where people work on research in science, engineering, and the humanities. ‘Research’ is an umbrella term for a large scale of paradigms and methods in pursuit of the attainment of knowledge. A theologian who works with books at his desk is different from a biologist who works in her laboratory in more ways than just their respective work place environment. Not only the topics they research differ from one another, but the possible applications of knowledge gained by each differ as well – and thus this knowledge’s impact. However, every research result may have small yet unforeseeable impacts which is why, regardless of the research area, possible outcomes should be considered as early as possible.

But both the theologian and the biologist have more in common than one might first notice – both are academics, both work guided by methods and theoretical frameworks, the results of their work are intersubjectively comprehensible. They engage in research activities to gain knowledge in an open and unbiased way.² Both follow the idea of scientificity. Both are free to choose research questions at their will and do not have to justify their decisions.³ They may choose the research objects and methods they want, but they have to deal with the moral questions attached to the decisions they make. Boundaries are set by the law and codes of conduct, ethics, professional practice of the respec-

2 Cf. R. K. Merton’s ethos of science, in which he points out four characteristics: “Universalism”, “‘Communism’ (in the non-technical and extended sense of common ownership of goods”, “Disinterestedness,” and “Organized Skepticism.” (Merton, 1958, p. 553-561).

3 These are the ideal circumstances for tenured professors in Germany who are not engaged in third-party funded research or contract research, but generally everyone can claim it. This independent research does not require any legitimation from outside, however, if humans or animals are involved, it might require approval from an ethics review board (cf. Turner, 1986, p. 16).

tive learned societies.⁴ In Germany, research is protected by article 5 (3) of the Basic Law (constitution) (Grundgesetz, 2016), yet this defensive right does not release researchers from responsibilities they hold beyond any legal regulations.⁵ This ‘burden’ which individual researchers have to bear and which cannot be delegated to collectives,⁶ will be analyzed in this paper.

Outlining the structure, the tasks, and the benefit of research ethics in the digital age requires that we first clarify the questions we debate: What is research ethics, and what are the characteristics of the digital age and how are they related? This is important when we talk about research ethics *in* the digital age since this implies that there might be certain conditions which can yield further implications. In this paper, the argument for an integrated approach of research ethics is outlined.

2 Fundamental questions concerning research ethics

Even if ethics seems to be an everyday issue, we must not forget: Ethics is an *option*, nothing more but also nothing less than this. That might appear as a triviality at first sight, yet, there is more to it. Reflecting on actions is a decision that has to be made, as this reflection (prior to or even after the completion of an action) is not a condition tied to actions. Where some might think this is a natural thing to do, others disagree.

Since ethics is optional, it is required to promote ethics if one deems it useful. Ethics is both an area of research within the arts and humanities (*‘Geisteswissenschaften’* in German) in which theories concerning the reflection on actions are developed – which help checking the validity of justifica-

4 Examples of codes of conduct and ethics codes are: Ethical Decision-Making and Internet Research: Recommendations from the AoIR Ethics Working Committee, Version 2 (Markham & Buchanan, 2012); Ethik-Kodex der Deutschen Gesellschaft für Soziologie (DGS) und des Berufsverbandes Deutscher Soziologinnen und Soziologen (BDS) (2014). It is common practice in German scholarly societies in social sciences to impose these codes (DGPuK, 2015; DVPW, 2016). This is not always seen as an ideal situation, as Günther points out structural problems connected to questions of motivation, liability, and competence (2003, p. 199f).

5 According to Scholz, scholarly research and science (“Wissenschaft”) is “a particularly autonomous circumstance of life, which is rooted in and comprises a plethora of intellectual and autonomous as well as communicative cognitive processes and imparting processes, and which remains open (has to remain open) regarding its definition.” (my transl.) Yet, there are restrictions (Scholz, 2014, margin no. 85.87f.).

6 According to Birnbacher (2013, p. 19), there are no collective agents, because collectives do not have to capability to reflect on actions, nor are they able to reason. Therefore, we cannot evaluate collectives with respect to morality, even if we can attribute actions to them. The attribution of characteristics of awareness is only possible with respect to individuals within the collective.

tions of moral statements (Düwell, 2013, p. 37) – and it describes the application of this knowledge to a specific area of research (‘applied ethics’), which is as what research ethics is generally understood.

As we cannot assume that it is obvious what the right decision is within a certain setting, we need one or more methods that help to provide orientation towards what action should be pursued. These methods for the evaluation of different courses of action, as helpful as they may be, can also be object of controversies as the decision for a method is an action which again can be the object of an ethical evaluation.⁷

This problem will have to be left aside and we will directly proceed to the analysis of the term ‘research ethics.’ This compound noun hints at a special kind of ethics which is connected to research. Presumably, research ethics belongs to the field of applied ethics – but there is another option.

Schweidler identifies three readings of the German term “*Wissenschaftsethik*” (“ethics of science” including all academic disciplines), which are (1) research ethics, (2) the ethos of science as put forward by Merton (1958, p. 553), and (3) “the responsibility of research” (2005, p. 957, my transl.). The latter is found in Lenk’s work, who analyzes ethics of science and research ethics with regard to responsibilities within the field of science and research and beyond (Lenk, 1991, pp. 54-75).

Ethics of science (in a broader sense, including the arts and humanities) and research ethics are not unambiguously defined areas, as they are merely constructs which help provide orientation on the wide field of ethics. Similar to the blurred boundaries between the fields of economic ethics and the ethics of politics, we can find overlappings between ethics of science and research ethics. Both terms are used interchangeably (Graumann, 2006, p. 253). In Germany, however, the law understands *Wissenschaft* (the aggregate of all academic disciplines): “as a generic term for scientific or academic research and academic teaching” (Scholz, 2014, no. 85). Notably, this differentiation is not upheld throughout the discourse on research ethics and ethics of science as teaching is marginalized. Graumann differentiates between research ethics, which deals with research and the ethics of science, which deals with “the triad science, technology, and society”,⁸ (2006, p. 253, my transl.) which is also an arbitrary position and not a natural setting.⁹

7 This is a problem which is called “Münchhausen trilemma”: it is either an “infinite regress”, a “logical circle”, or stopped by “breaking off the process” (Albert, 1985, p. 18). This problem will not be discussed in this essay.

8 This idea can also be found in the title “Technik- und Wissenschaftsethik” (“Technology Ethics and Ethics of Science”, my transl.) (Hubig, 2003).

9 This however puts a focus on technology in a narrower sense (technical artefacts) and leaves aside all non-technical disciplines.

If we take Graumann's proposal of research ethics as ethics that focuses on research, then ethics of science could be understood as a superordinate ethics (but not metaethics) that focuses on research and researchers, research institutions and their relation to society, individuals, culture, law, etc. In this case, research ethics would be a special case of ethics of science, which would take the general settings and conditions of *Wissenschaft* (all academic disciplines) into account. Then, Lenk's account of the term responsibility could be employed in an appropriate way. Lenk (1991, p. 61) proposes an analytic differentiation in (1) "responsibility concerning actions and the results of actions," (2) "responsibility with respect to roles and tasks," (3) "responsibility regarding morals," which is always attributed to an individual, and (4) "legal responsibility," which he understandably leaves aside, as the reflection on morals and morality and the legal sphere aim at different goals: the first at the good life, the latter at the creation or protection of legal peace. Lenk (1991, pp. 61ff) notes that these responsibilities may collide which makes prioritizations inevitable. He also differentiates between an inside view of the responsibility of researchers which focuses on the "ethos", i.e. the basic convictions and attitude of a researcher, and an outside view which focuses on ethics (Lenk, 1991, p. 58).

3 Problems in research ethics

Research ethics can be understood as a two-part endeavor: first, as part of ethics as an academic discipline which is usually situated in the philosophy or theology department (i.e. as part of foundational research in ethics), and second as ethics which is applied to research processes which are not connected to ethical questions (i.e. as applied ethics). Both carry the same name, yet differ in the level of reflection. This becomes a problem, when the discourse on fundamentals and the discourse concerning the application of ethics are drifting apart. Merging both understandings of research ethics into one process yields an environment in which the problem of the drifting apart disappears.

Prior to exploring the options for this merger, we need to take the possibilities of research ethics into account: Who are the actors in this field and what is done there? When people demand 'science requires ethics' or 'research needs boundaries,' they employ abstract nouns while meaning those who work in this field. Thus, research ethics will always have to consider people even when it takes institutions into account. The content of research ethics, however, is not clearly defined. The examples that can be found in literature range from how to deal with plagiarism (Rieble, 2014, pp. 11-23), fraud (Elger & Engel-Glatter, 2014, pp. 25-42), to general accounts of responsibility in the academic sphere. Some are very specific, others, such as Jonas' concept of a "Heuristic of fear"

(1984) are more general. Lenk (1991, pp. 54f) criticizes that many works in this field (not Jonas' though) are inadequately general, as they lack differentiations regarding terminology in ethics and with respect to the term responsibility.

Research ethics can be applied in three modes, if you leave out the fourth option of a proactively (in the sense of discussing actions that have not yet been conceived) acting research ethics. This is impossible as per definition ethics reflects on actions which must be there first, before ethics can meaningfully act, even if these actions are only hypothetical. Hence, ethics is always reacting.

The modes are (1) external reacting research ethics, (2) internal reacting research ethics, (3) integrated research ethics¹⁰.

Ad (1): External reacting research ethics describes the case in which an individual or a group of ethicists evaluate the work of others. This may either be an invited or an unsolicited ethical evaluation and can be propelled by negative or unwanted consequences of research activities. It is also possible, but less common, that research ethics endorses and legitimizes a certain kind of research. Mittelstraß calls this a "repair ethics" (my transl.), which he deems better than not employing ethics at all, yet still delivering a damning indictment of human reason. Ethics then appears as degraded to checklists and a "recipe book" (my transl.) which provide advice on how to act. He castigates this idea of research ethics and ethics of science as a "technocratic" (my transl.) approach, which disregards humans as "ethical beings" (Mittelstraß, 1992, pp. 217f, 252f; 1991, 89-108). Even though Mittelstraß's account of this terminology and the way ethics is dealt with is strongly related to publications from the field of engineering, especially from the VDI (*Verein deutscher Ingenieure*, *Association of German Engineers*), we can see it as a general example of external, reacting research ethics, because the reflection on morals and morality is outsourced to checklists with norms which were developed externally and which display a "peculiar positivism of values" (my transl.), thus relieving researchers from independent reflection on what they do. It is also reacting in a classical way as it is only employed in the aftermath and not parallel to the (planning of the) research process.

Another version of external research ethics is the ethics brought to science by scholars from the humanities – these scholars are professionals in the field of ethics. Their ideas and responses to problems that appear in or as results of research can help recognize problems which were originally unknown or ignored, because the researchers were neither trained to recognize them nor aware of the implications of their research for areas not directly related to it. Dealing with such problems is part of the research ethicists perform, which may cause a follow-up problem we will look at when we consider interdisciplinarity.

10 Which still is reacting, yet in a different sense, as we shall see.

At this point, a digression is necessary to take a further problem into account. Körtner (2015, p. 640) hints at a moral hazard which might arise from the constellation described above: scholars from the humanities might artificially render research plans, processes, or results problematic as this provides objects for their own research, helping to obtain third-party funding and earning academic merits. This is an audacious assumption, yet as a hypothetical scenario, it seems plausible (even if it is prone to fail in the long run as such strategies can be uncovered). Here we encounter another problem, which is not focused on research alone as it is emerging in an academic or scholarly setting, in which the hunt for third-party funding has developed strange effects. External funding can be necessary for a career in academia. This explains the free rider strategy, but does not, in any way, justify it.

A way out of this moral hazard are review procedures by review boards not only for research projects, but also for research ethics-research. Yet here, again, we come to the point where we need a very first instance which cannot pursue a *‘do ut des’* principle and is thus not prone to encounter a moral hazard.

Ad (2): Internal reacting research ethics describes a case in which researchers work for themselves on ethical problems they encounter or identify in the process of their research without consulting specialists. This way, no external parties who might act in their own interest come in. However, the price that researchers, as well as all the stakeholders, have to pay is that organizational blindness may render problems invisible. Internal research ethics may also raise awareness and lead to employment of external research ethics, which alleviates the problem but does not solve it.

Ad (3): Integrated research ethics does neither only accompany the research nor work alongside the research process, but is seamlessly integrated into the academic sphere, in research as well as in teaching. Students – as future researchers – thus gain knowledge and competences in ethics in their course of studies from faculty staff and not from external lecturers.

Every academic discipline has borders, which separates them from others. These borders are imaginary and result from the pragmatic decision to reduce complexity. As helpful as this reduction of complexity may be, it is an impediment to employing an integrated research ethics strategy. Ethicists are usually working in theology and philosophy departments, but overcoming these borders will allow synergetic processes. Ethics will then not be taken to other departments, but be an integral part of them. In 2005, Heinrichs, Hübner, Heinemann and Fuchs (2005, p. 39-43) named research ethics as part of the curricula in the sciences and medical studies a “desideratum” (my transl.) which, if implemented, would provide students and graduates with an insight into ethics. A similar demand was put forward by the IEEE in their proposal for *Ethically Aligned Design* (2016, p. 37f).

The establishment of integrated research ethics is a long-term project which requires structural changes in the way departments (at German universities) are organized. There is no best-practice model I know of (in 2016). In such an environment, researchers have acquired the ability to employ ethical knowledge from the beginning onward and can consult with professional ethicists in their departments, who also have a deep insight into the research projects that are worked on. These ethicists are neither outsiders nor mere consultants, and not to mention they are not chaplains for others but established and equally entitled members of the research groups. Once these structures are established, a culture of interdisciplinarity can develop and unfold, broadening the scope of research processes and thus providing structures which take the research's overall impact on society into account. Ethics will then not be perceived as something which was imported or dragged in from outside, either from philosophy or theology departments or from other fields. The latter would be the case when concepts from bioethics are introduced to social sciences. This creates incompatibilities and allows ethics to appear as a burden researchers have to bear (Israel & Hay, 2006, p. 1).

Ethics, as an academic discipline within academic disciplines, can moderate processes and function as a catalyst, but only if it is not employing prefabricated ideas and regulations. Instead, it has to be developed within an area of research, not as an application of ideas but from the very beginning. Any ethical framework that is imported might be seen as a handy tool at first sight, but once problems with this tool arise, a custom-tailored solution will be even handier.

4 Problems with interdisciplinarity¹¹

Ethics is a wide field in itself and even when focused on research and science it is still complex. Professional knowledge from academic disciplines and professional knowledge that provides orientation from the field of ethics have to be brought together. The usual way to organize this is through an interdisciplinary approach – which is easily called for but hard to achieve. The pitfalls that come along with interdisciplinarity need to be known in order to avoid them.

Looking at professional knowledge, we can assume that researchers have professional knowledge of their fields; sometimes they might be the only ones who know about the problems in this field. The professional ethicist is, most often, a non-specialist in professions other than ethics (and philosophy or theology, respectively).

11 I am grateful to Christian Schwärke for outlining these issues and discussing them with me.

Three questions arise from these circumstances: one deals with the questions of understanding and perception of matters and problems, another with questions of self-perception, and the third one with questions concerning the institutionalization of ethics.

(1) Understanding/Perception: Leaving behind the idea that there are “two cultures” in academia which lack the ability of mutual understanding (Snow, 1993), we can still find problems which impair the possibility of a productive coexistence. This problem is caused by the way researchers speak and explain. To understand an academic discipline that has its own terminology and professional language, outsiders not only need a dictionary – they have to learn a new language. Every discipline seeks to grasp its objects of research as concise as possible with its own ‘tools’, which leaves little room for knowledge from other disciplines. This might yield the effect that researchers deem their understanding of matters as best or most suitable while they ignore important aspects that remain uncovered by the approaches they employ.

Another important factor is the insurmountable asymmetry in debates in ethics of science and research ethics: Ethicists make other researcher’s work (mostly the work of those who work empirically) an object of their own work. Yet, that does not work the other way: Ethics cannot be an object in this process.¹²

(2) Boundaries of professions: Furthermore, interdisciplinarity does not simply mean collaboration, but it means merging fundamental work. This is not the best situation, but this problem can only be solved if one person carries both of the following attributes: a professional ethicist and a professional in a certain area of research. Yet those who are both might have to live with their colleagues who happen to think that they do not work in ‘real’ science or do not fully belong to a certain academic discipline. This can result in an obstruction of interdisciplinary projects. This problem of acceptance is caused by normative consequences of an understanding of the imaginary boundaries between professions.

(3) Institutions: The third complex of problems is connected to the question as to whether it is desirable to institutionalize ethics. On the one hand, this is helpful because by means of this, ethical questions receive a legal frame and can step out of field of arbitrariness. Ethics, under these circumstances, would be an established part of academia in both science and research. On the other hand, institutions invite others to outsource their responsibility. But what we need are scientists and scholars who are aware of ethical questions that are

12 Even if we look at the example of a moral hazard Körtner describes, those affected will not be able to respond to that (illegitimate) behaviour without employing ethics, in which they are not experts.

related to their research. And here another problem comes in: Whichever question one hands over to an institution is dealt with in that institution according to the rules of that institution and the result will also be following these rules. These rules are not necessarily the rules of science.

Furthermore, institutionalizing ethics also creates the moral hazard described by Körtner, as more availment of such an institution means more (yet illegitimate) legitimization, which is not only an obstacle to research processes but also – if uncovered – a great disservice to the academic sphere.

5 The digital age

Now, we need to explore the term ‘digital age,’ which is similarly complex as the term ‘research ethics’. Nevertheless, in this paper we can only roughly sketch the idea behind this term. The digital is not a term that has come up recently, nor does it have a clear definition. All of us have a basic understanding of what is meant when someone talks about ‘the digital age.’ However, if we sat down and gave a concise account of what ‘digital age’ means to each of us, chances are that there are as many different descriptions as there are people writing answers.

Not all is new or different in the digital age. Stalder’s (2016) diagnosis of the “culture of digitality” (my transl.) is best served to get an idea of what has changed. The culture of digitality, according to him, is a process that has started in the 19th century and has accelerated in the 1960s, leading to a society and culture in which “social action is more and more embedded in complex technologies, without which these processes are hardly imaginable and not manageable at all.” (Stalder, 2016, p. 11). He identifies “three forms” that are “characteristic” (my transl.) of this culture: (1) Referentiality, meaning the reuse and continued use of existing cultural artefacts, (2) communality, as a description for collective efforts to create and preserve semantic frames, to generate various courses of action, and to exploit resources, and (3) algorithmicity, meaning “automated decision making processes”, and thus practices to reduce complexity and to produce information, by means of processing and managing data that is obtained by machines (Stalder, 2016, p. 13). The key word here is big data.

The digital age not only provides new research methods, but has also generated new research areas and questions as it has a major impact on our society. The claim that research needs ethics was not unheard of prior to the digital age, yet in the days of social networks, surveillance and tracking by public agencies and private companies this topic has garnered attention, as the analysis of these

data can yield moral problems concerning privacy even if the data handling is covered by the law.¹³ There is – at least in some subgroups of our society – an awareness for problems attached to these new possibilities. Helbing (2015, p. 4) hints at another characteristic of the digital age: the impossibility to attribute responsibility to individuals. The emerging new era brings along disruptive features which call for regulations.

6 Research ethics – an impairment to progress?

Research ethics, if employed as unbiased and open-minded, might stop or slow down research processes. This can be seen as an impairment to progress since the decision to not follow a certain path means that its possible result will remain unknown. This is the price not only the researchers and the scientific community must pay, but society must also be willing to pay this price. The decision against a way of gaining results, however, does not mean that this strand of research will be stopped entirely. The development of induced pluripotent stem cells (iPSCs) to replace embryonic stem cells in research shows that a moratorium or a strict limitation to research possibilities may fuel the development of alternatives (Klimanskaya et al, 2006; Devineni et al., 2016). Social scientists might face a similar situation in which they will have to take detours to obtain the results they look for.

Taking it one step further: Can the will to know per se be already morally undesirable? If we denied this, knowledge would be neutral. Knowledge, however, does not exist independently from human beings, who are moral beings. Knowledge is – if at all – in theory neutral. This may evoke a conflict concerning academic freedom, yet a closer look at this matter reveals that it is (ideally) academia itself which imposes restrictions. Questions like these were still “new land” in the sciences thirty years ago (Ströker, 1984, pp. 10f).

Should we impose general restrictions for some branches of research? This is neither useful nor reasonable. As described above, ethics can only react. A prospective general restriction could not be categorized as a reaction, hence general restriction cannot be wanted by ethics. (This does not mean that we should not follow principles, it means that we should not identify areas of research as generally unethical.) Research ethics is – in the end – an evaluative process which analyzes cases. The decision against a legally unproblematic

13 Think of biometric passports and passenger name records, web trackers, fitness trackers, cashless shopping – all of this creates large amounts of data which allow to identify individuals, which some deem helpful for catching criminals, whereas others hint at the price we pay for this – the loss of privacy and the possibility of abusing these data in various way.

research project due to the outcome of risks analyses should always be the “final means” (DFG & Leopoldina, 2014, p. 14). It is the researchers who bear the burden of taking responsibility. They ultimately decide, which is why they should not only be able to assess projects from their discipline’s view. Taking a paramount view at cases, from as many perspectives as possible, is a competence they require to evaluate situations and risks without being unnecessarily overly restrictive or too permissive. It sometimes is a fine line, but they are professionals and with appropriate training, they will be capable of coping with these issues.

7 The integrated approach to research ethics in the digital age

As stated above, the digital age provides new research methods and possibilities that will foster developments in the social sciences. These methods are not neutral regarding morality – employing them, even if out of curiosity, may result in problems which could lead to public distrust in academic endeavors. Safeguarding these projects requires an ethics that suit the new situation. This ethics is best developed within this new environment to avoid the problem described by Israel and Hay (2016, p. 1). The way biomedical ethics wants researchers to work with humans can be roughly transferred to social sciences. However, there are limits to this approach. Take for example an automated assessment of tweets by a large amount of people. There is no *easy* way to contact each individual to ask them for permission and to obtain an informed consent. This is one example of problems that arise when the amount data that is used becomes larger.

Privacy becomes more important as more data related to individuals is stored either accessibly to the public (as in social networks) or only accessible to the people who collect and process the data. Furthermore, experiments carried out without informing those who (involuntarily or unknowingly) take part in it, also create a problem. We would expect that a publication of the findings is difficult, however, Kramer’s, Guillory’s, and Hancock’s article was published in the *PNAS* (2014). Retrieving this article online leads to a document that has an “Editorial Expression of Concern” placed in front of it (Verma, 2014, p. 10779). The editor hints at the “Common Rule” of the US Department of Health and Human Services Policy for the Protection of Human Research Subjects, which *PNAS* has adopted, but also points out that this rule is not applicable to Facebook as it is a private company. “It is nevertheless a matter of concern that the collection of the data by Facebook may have involved prac-

tices that were not fully consistent with the principles of obtaining informed consent and allowing participants to opt out.” (Verma, 2014, p. 10779).

This statement is, to my mind, the easy way out. Either there is doubt – then they should refrain from publicizing the article or there is not, then a statement such as Verma’s is unnecessary. This situation shows that there was no procedure put in place to deal with this case. To avoid situations such as this one, it is necessary to embrace research ethics not only in the data collection and processing processes but also in the places that distribute other’s works. This once again emphasizes the need of an integration of ethics. Research ethics is then ideally understood not as applied ethics but as the development of ethics as a collaboration of all the stakeholders in research for all stakeholders in research – rendering ethics itself an interdisciplinary endeavor (Schwarke, 1994, p. 11).

If those who are involved do not only follow rules and apply prefabricated ethics to their work but develop and employ methods to evaluate what they do on their own, they will consider the broader picture, thus taking a wider circle of stakeholders into account. This will not eliminate the potential of conflict, but it will create a culture of research and an environment in which other’s interests are considered from the beginning. This does not come for free but it will be beneficial: researchers will profit from an increased trust in their work, those whose taxes are invested in research programs will know that the people who spend the money are well trained.

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