



Broadening the lens for the governance of emerging technologies: Care ethics and agricultural biotechnology



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ABSTRACT

In this paper we argue that insights from feminist perspectives, particularly in the form of an ethics of care, have a number of advantages when used as a lens through which to consider questions relevant to the governance of emerging technologies. We highlight how an emphasis on central themes of importance in feminist theory and care ethics such as relationality, contextuality, dependence, power, affect, and narrative can shine a light on a number of salient issues that are typically missed by the dominant and largely consequentialist risk assessment frame. We argue that the care ethics lens is a better fit when technologies are understood not simply as devices designed to create a certain end experience for a user but as transformative systems that smuggle in numerous social and political interests. The advantages of these care ethics themes for emerging technologies are illustrated through a detailed consideration of agricultural biotechnology. We show how the feminist care ethics lens might have anticipated the very questions that have proved themselves to be the sticking points for this technology. We therefore suggest that applying a care ethics lens can significantly broaden the frame of appraisal processes used for the governance of emerging technologies and usefully grant legitimacy to questions and concerns that are prominent in public discourse but typically left out of practices of risk assessment.

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1. Introduction

After thirty years of careful and innovative work, gender considerations have secured an important place within science and technology studies. Feminists have looked critically at the make-up of research communities and exposed the hidden values and assumptions those communities can perpetuate [8,12]. They have exposed the association between a hegemonic conception of masculinity and a culturally loaded understanding of science and technology [20]. By highlighting the material-semiotic dimension of technological products, feminists have explained how technologies can reproduce gender and recreate gender power relations in society [32,79]. In addition, feminist science studies theorists have scrutinized unquestioned representationalist frameworks utilized in science and have helpfully challenged classic dualisms between subject and object, active knower and passive known, nature and culture, human and non-human, organism and machine [28,2]. Through relentless analysis, the political dimensions of technoscience have

been laid bare [80] and thanks to this body of work, it is hard to look at science or its products without wondering where gender appears, or remains concealed, within it.

Feminist care ethics, however, has made less frequent appearances in science and technology studies. Evelyn Fox Keller's examination of Barbara McClintock's "feeling for the organism" raised the prospect of an important role for affect in scientific research [40]. Recently, prompted by Bruno Latour's reframing of "matters of fact" as "matters of concern" [44], Maria Puig de la Bellacasa has raised the notion of "matters of care" to encourage "an ethos of care within the study of science and technology" [4; p. 85]. A special issue soon to be released focuses on the politics of care in technoscience, including some of the inherent ambiguities and challenges involved [50,77] as well as questions around temporalities of care [5,62]. There has also been a small amount of work investigating care under the banner of Responsible Research and Innovation (RRI), a frame for understanding the craft of scientific practice [16] and addressing concern about future generations in light of the uncertainty created by new technologies [23,24]. Aside from these sporadic shoots of recent interest, care ethics has thus far played only a minimal role in feminist science and technology studies.

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While we suspect that feminist care ethics might indeed provide a helpful lens through which to consider a proper relationship to the matters of concern in science, and also provide a vision of how to be responsible towards future generations, we think that the advantages of feminist care ethics in the context of powerful emerging technologies – such as biotechnology, nanotechnology, synthetic biology and geoen지니어ing – reach considerably deeper. We suggest that, compared to the consequentialist and broadly utilitarian risk analysis approach that currently dominates decision-making, care ethics can provide a broader framework through which to appraise new and emerging technologies, one that usefully illuminates important issues tending to remain concealed in traditional risk assessments but often dominating public discourse and debate. This includes issues relating to shifting relationships, dependencies, and power distributions, as well as attention to specific context, to the affective dimensions of the experience of technology, and the interconnections illuminated in narrative forms of story-telling. In the body of this paper, we illustrate the value of approaching technology appraisal through a care ethics lens because of the way it opens for the legitimacy of these issues using the case study example of genetically modified organisms (GMOs) in agriculture. However, in order to reveal the advantages of the care ethics lens and explore their value in the context of a particular case study, it is helpful to first briefly review some of the recognized shortcomings of the existing risk analysis framework for appraising new and emerging technologies and to appreciate the relational philosophy of technology that feminist approaches tend to adopt.

2. Some limits of the dominant “risk” frame

Sociologist Ulrich Beck has argued that risk has become the central organizing concept of modern industrialized societies [3] and indeed, risk assessment has become the dominant tool for informing and aiding decision-making in the governance of new and emerging technologies [38,84]. In this context, risk is typically understood as involving the potential for negative consequences to attend the introduction of a new technology, the magnitude of these potential consequences, and the probability that they will occur [13,14]. When used for the governance of new and emerging technologies, the risks of interest are typically those relating to potential harms to human health and/or the environment.

One inherent problem with the use of risk analysis as the dominant approach to appraising emerging technologies is that the risks they pose to human health and the environment are often also novel. This leaves them poorly understood and requiring the development of new test methods and/or instrumentation to generate the empirical data required for such an assessment [52]. Such a lack of existing empirical data means that it is very difficult to predict and calculate prospective harms with any confidence in advance. This shortcoming is amplified by the fact that harms are often non-linear, incremental, emergent, and (sometimes) enduring. Rather than reducing uncertainties in a gradual step-wise fashion, conducting more research on the potential risks of emerging technologies can also open up previously unconsidered questions and reveal new fields of uncertainty. Furthermore, the uncertainties surrounding emerging technologies can exist in both quantitative and qualitative forms [70,87]. Some uncertainties will stem from a simple lack of knowledge and be reducible over time, while others will be more systemically embedded, stemming from the inherent limitations of scientific knowledge for understanding complex systems and the inevitable framing choices scientists make in the planning and conduct of their research [83].

Further challenges abound. Not only can harms appear in radically different forms, conceptions of what actually constitutes a

harm can also vary significantly. While harms to human health and well-being tend to be regarded as prototypes, they are certainly not the only form of harm. For example, economic harms (understood as costs or losses) are often given significant weight and can also be deployed as proxies to evaluate the seriousness of any predicted health and environmental impacts. Other types of harm, sometimes misleadingly called “moral losses”, are also significant and impact the social fabric in ways that often resist formal accounting.¹ For example, harms to traditional knowledge, to community cohesiveness, or to a sense of place are different from harms to health and well-being but should be no less an important part of the assessment of a new technology. Harms to the non-human environment are also real and often relevant but tend to be difficult to identify and quantify. This challenge stems in part from the way that the object of interest can vary (e.g. harm to individual organisms, species, populations, ecosystems, functions) but also by the way in which constant change within nature gives no stable baseline for defining harm. Subtle shifts in symbiotic relationships (e.g. as one pollinator gets nudged aside by another that may be more suited to a changed crop system) have no clear metric for quantification. Growing interest in the significance of “socio-economic” impacts, “non-economic” damages and the “cultural services” of ecosystems, arguably highlight the incompleteness of technology appraisal processes focused solely on risks to human and environmental health.

For emerging technologies that promise deep transformations of social, economic, and biological life, the consequentialist approach of risk analysis is inadequate for identifying the varied forms of peril that may lurk beneath the hype and hyperbole surrounding the technology's introduction. This is not only because of the limited scope and quality of available information for assessing risks associated with emerging technologies, nor simply because the focus on impacts on human health and environment is too narrow. It is also importantly connected to how technology is being conceptualized.

3. Technology as a deep cultural practice

Feminists have joined a number of voices within the Science and Technology Studies (STS) community and argued that technological assemblages are not merely objects but “knots of social and political interests” [4] or what Bruno Latour called “embodied sociality” [43]. Such a standpoint demands a heightened sensitivity to the technology's “political qualities” [75]. The fact that this important point was missed for so long reflects the pervasiveness of the “device paradigm”, which Albert Borgmann claims has dominated contemporary life [10]. In the device paradigm, “means” are concealed or shrink from view while “ends” – the commodity/outcome that the technology has promised to deliver – occupy all the attention. When technology is perceived as a device merely delivering an end, a certain kind of blindness to underlying social and cultural entanglements is encouraged. Within this paradigm, technology gets assessed only thinly for the kind of end experience it provides and not for the kind of transformations of material and social structures it creates. With emphasis only on the experienced end, it becomes reasonable to think that benefits and harms might be isolated and quantified using a consequentialist frame such as that involved in risk assessment.

From Heidegger to contemporary feminist technoscience, the warnings of the dangers of such a view are legion. Technology is not a neutral device, it stems from and frames our socio-cultural beliefs

¹ This characterization is misleading because most types of harm considered by risk assessment are in some sense ‘moral.’

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