

One may say that I am responsible for the possible consequences of my action weighed by their respective likelihoods. But this way of talking can cause confusion. For this reason, we should restate the previous claim, *viz.* that I am only responsible for my actions and that I am, insofar as I am responsible for my actions, also responsible for the probability distribution of possible consequences that is caused by that action.<sup>8</sup> The responsibility for consequences is, to that extent, included in a responsibility for actions and the associated probability distributions of their possible consequences. Over and above that, there is no independent responsibility for consequences.

## 6. Conclusion

In this short piece, I have argued on the basis of the view that we are responsible to the extent that we are or should be guided by reasons. This led me to making the following claims: Firstly, we are responsible for our actions. We are responsible for all of them. Once a behaviour is properly seen as an action, the agent is responsible for it. Agency and responsibility are two sides of the same coin. This only makes sense, however, if we adopt a gradual understanding of agency and responsibility, as I also explained. Secondly, we have a responsibility for our convictions. Like actions, convictions are guided by reasons. Hence, it would seem to be an artificial limitation of the concept of responsibility if we were to confine it only to actions. Thirdly, I argued that we can have a responsibility for our (emotional) attitudes, too. The reasoning behind that claim employed the same premise. Having reasons implies responsibility. And since attitudes are amenable to reasons, we can be responsible for them as well. Finally, I discussed the idea that we can be responsible for the consequences of our actions and rejected it. Instead, I argued that we can be responsible only for the probability distribution of possible consequences that is caused by the action that we chose.

---

<sup>8</sup> In scientific theory and probability theory there is a controversy as to whether it is appropriate to speak of “causation” in this context. I, however, see good reasons in favour of a probabilistic concept of causation, which would legitimate that we use this expression here.

# Technological progress and responsibility

*Nikil Mukerji*

## 1. Introduction

In this essay, I will examine how technological progress affects the responsibilities of human agents. To this end, I will distinguish between two interpretations of the concept of responsibility, *viz.* *responsibility as attributability* and *substantive responsibility*. On the former interpretation, responsibility has to do with the idea of authorship. When we say that a person is responsible for her actions we mean that she is to be seen as the author of these actions. They can be attributed to her, such that she can be normatively appraised – i.e. blamed, praised, etc. – on that basis. In discussing this kind of responsibility I will show that the responsibility of human agents tends to increase as their technologies progress. This claim is often taken for granted, but seldom clarified and argued for. I will give it a clear interpretation and provide a semi-formal reasoning that supports it. The second interpretation of responsibility that I will discuss is substantive responsibility. It has to do with the normative demands that confront us – with what we are required to do. I will argue that technological change can affect, firstly, what our substantive responsibilities are on a case-by-case basis. Secondly, I will try to show that it can affect the way we think about our substantive responsibilities at the level of theoretical normative ethics.

The remainder of the text is structured as follows. In the next section, I will start off with a few rather general remarks about the idea of responsibility in which I shall distinguish between responsibility as attributability and substantive responsibility. In the two sections that follow, I will try to support the two aforementioned claims. First, I will argue for the view that advances in technology tend to increase human responsibility in the sense of attributability. Then, I will try to show how technological change affects our substantive responsibilities as well as the way we think about them at the level of normative-ethical theory. In the final section, then, I will sum up and conclude.

## 2. Some clarificatory remarks on responsibility

First off, I should disambiguate the term “responsible”, which can be used in various senses. We can say, e.g., that the corrosion of a pipe was responsible for its bursting.<sup>1</sup> And we can say that Smith kicked Jones’ shin bone and is thus responsible for hurting Jones. In the first example, we use the term “responsible” in the same sense in which we use the word “causal” (or “causally responsible”). In the second case, we presumably use the term “responsible” with different intent. We are not just saying that Smith’s kick *caused* Jones’ pain (though we presumably believe that, too). Over and above, we want to say that Smith is *normatively* responsible for harming Jones. The latter idea is closely related to the idea of blame and to the various other reactive attitudes that figure prominently in the moral psychology of responsibility.<sup>2</sup> In the following, I will, of course, focus on the second, i.e. normative, idea of responsibility.<sup>3</sup>

This having said, I can differentiate the idea a bit further. As I already pointed out in the introduction, we can speak of normative responsibility in two different senses, *viz.* in the sense of *attributability* and in the sense of *substantive responsibility*.<sup>4</sup> In the two subsequent sections, I will discuss how technological advancements affect both kinds of responsibility. Before I can do that, however, I need to make some preliminary observations.

<sup>1</sup> I borrow this example from J. Nida-Rümelin, *Verantwortung* (Stuttgart: Reclam, 2011), 19–20.

<sup>2</sup> On that point, see P. Strawson, “Freedom and Resentment,” in (1962) *Proceedings of the British Academy* 48, 1–25.

<sup>3</sup> As Julian Nida-Rümelin explains, the distinction between causation and responsibility is actually more complex than I just depicted it: “A plumber who is inspecting a pipe burst may point to the corrosion of the pipe as the cause. But this utterance can have a meaning that is to some extent normative. It can mean that everything else – e.g. the water pressure, the thickness of the pipe, the bolting and so on – was the way it was supposed to be. Only the corrosion was not supposed to be there. The corrosion would then not suffice for a comprehensive causal explanation of the pipe burst. Such a causal explanation would have to include many factors, such as the water pressure, the thickness of the pipe and many others, which jointly explain the pipe burst. But it can be singled out as *causal* or *responsible* because it deviates from its expected or normal condition, which serves as a normative standard.” J. Nida-Rümelin (fn. 1), 19–20 (my translation, NM).

<sup>4</sup> Cf. T. M. Scanlon, *What We Owe to Each Other* (Cambridge, MA: Harvard University Press, 1998), 248.

Let me start with responsibility as attributability. When we talk about responsibility in that sense we pronounce that somebody is responsible *for something*. What this means is simply that the person in question is, in an appropriate sense, to be seen as the *originator* or *author* of that something, such that the former can be morally appraised on the basis of the latter. That is, we can ascribe praise, blame and so on to the respective person. Now when do we ascribe responsibility in this sense? On one plausible view, responsibility as attributability is linked to rationality.<sup>5</sup> That is to say, it is linked to our capacity to appreciate, weigh and give reasons. Being responsible hence means, quite literally, being required to *respond* by giving reasons. As a consequence, we can only be responsible (or ascribe responsibility to another) for something if that something is amenable to reasoned deliberation.

The account I have just introduced confines both the scope of possible objects and the scope of possible subjects of responsibility. Let us consider the former first by asking which possible objects of responsibility there are or, to put it differently, what we can possibly be responsible *for*. If, as I have just assumed, responsibility is connected to rationality, we can be responsible only for objects that can plausibly be seen as and should be the product of reasoned deliberation. This means, first of all, that we have an *agential responsibility* – a responsibility for our actions. Our actions, after all, are driven by reasons. But it also means that we can be responsible for other objects that are not typically seen as objects of responsibility. We can, e.g., have an *attitudinal responsibility* – that is, a responsibility for our attitudes. And we can have an *epistemic responsibility* – that is, a responsibility for our convictions. After all, attitudes and convictions are also amenable to reasons.<sup>6</sup> Be that as it may, in my discussion of responsibility as attributability, I will put attitudinal and epistemic responsibility aside and focus exclusively on agential responsibility.<sup>7</sup>

<sup>5</sup> I follow the view expressed in J. Nida-Rümelin (fn.1). An abridged statement of his ideas about responsibility can be found in J. Nida-Rümelin, “On the Concept of Responsibility”, which is contained in this volume.

<sup>6</sup> Cf. J. Nida-Rümelin, “On the Concept of Responsibility” (fn.5).

<sup>7</sup> On the account of responsibility that I am using here, agential responsibility is, in fact, quite far-reaching. It implies not only that we are responsible for some of our actions. Rather, it says that we are responsible for *all* of them. This follows from what I have said so far in conjunction with an analysis of the concept of an action. Actions have behavioural components. When we act we move our bodies. But we do not think of every behaviour as an action. It is only intentional behaviour – behaviour driven by

That said, I should mention that different kinds of agential responsibility can be distinguished – at least if you believe, as some authors do, that we can differentiate between various types of agents. In what follows, I will focus on *individual agential responsibility*, which is the responsibility of an individual agent for her actions, though I will not use these qualifiers. In passing, I should note, however, that there are various other possible subjects that may be seen as candidates for agential responsibility. Christian List and Philip Pettit, e.g., have recently revived the idea of *group agency*, which holds that groups can be agents and thus capable of responsibility, too.<sup>8</sup> And a number of authors have suggested that technological artefacts can also be seen as agents who may bear agential responsibility. This holds in particular for Daniel Dennett, who has argued that a computer system like HAL from Stanley Kubrick’s movie *2001 – A Space Odyssey* (1968) could conceivably be viewed as an agent who is subject to responsibility.<sup>9</sup> As I just said, however, I will not discuss these forms of responsibility in what follows.

Having clarified the idea of responsibility as attributability in the sense of individual agential responsibility, I can now move on to the idea of substantive responsibility. As T. M. Scanlon explains, judgments of substantive responsibility simply “express substantive claims about what people are required (...) to do for each other.”<sup>10</sup> To say that

---

reasons – that we think of as an action. Therefore, since all actions are driven by reasons and we are, according to the account of responsibility that I have just proposed, responsible for something to the extent that that something is or should be guided by reasons, we are responsible for all our actions.

<sup>8</sup> See C. List, P. Pettit, *Group Agency* (Oxford: Oxford University Press, 2012). Note that the view of List and Pettit is controversial since the idea that groups can be agents appears to be metaphysically queer. I have nevertheless tried to defend it in a recent paper, N. Mukerji, C. Lütge, ‘Responsibility, Order Ethics and Group Agency’, in (forthcoming) *Archiv für Rechts- und Sozialphilosophie*.

<sup>9</sup> See D. Dennett, ‘When HAL kills Who is to Blame?’, in D. G. Stork (ed.) *HAL’s Legacy: 2001’s Computer as Dream and Reality* (Cambridge, MA: MIT Press). The paper is reprinted in this volume. For a critique of Dennett’s viewpoint view, see J. Nida-Rümelin, ‘Agency, Technology and Responsibility’, in *Politica & Società* (forthcoming).

<sup>10</sup> T. M. Scanlon (fn.4), 248. It may be noted that Scanlon’s explanation of substantive responsibility is quite narrow. In the case of responsibility as attributability I distinguished between agential, attitudinal and epistemic responsibility (as attributability). Similarly, it seems not unreasonable to distinguish between different kinds of substantive responsibility, *viz.* agential, attitudinal and epistemic (substantive) responsibility. Scanlon’s remark only captures the first of these. Given the purpose of this essay in which I focus on agential responsibility, this is, however, a moot point.

a person has a substantive responsibility to do something is thus to say that there is a normative requirement upon her to do it.<sup>11</sup> Our substantive responsibilities depend on the choice situation that we are in and they have a *content*. In other words, whenever we have a substantive responsibility, we are required to do something *specific*. And what that specific thing is depends on our options for acting as well as the reasons for and against these options. From an ethical point of view, we are supposed to weigh these reasons and choose accordingly. Thus, while we satisfy our agential responsibility (as attributability) by giving reasons for what we do, we satisfying our substantive responsibility by doing that which we have sufficient reason to do.

### 3. Technological progress and agential responsibility

What I said in the previous section prepared my substantive discussion of the relation between technological progress and responsibility. In this section, I will address the idea of agential responsibility as attributability. My claim is that technological progress tends to increase and never decreases our agential responsibility because it tends to increase and never decreases our options for acting. There are cases where new technologies do not give us new options for acting, thus leaving our choice situations unchanged. In these cases, our agential responsibility stays the same. In other cases, however, new technologies affect our choice situations by increasing our options for acting. And in these situations they increase our agential responsibility. This, in fact, seems to be a purely conceptual matter, as we shall see.

In order to explain the argument for this claim, I need to explain, first of all, what it means for our agential responsibility to increase. An informal way to answer this question is to say that our agential responsibility increases if the requirement to give reasons for our actions becomes more demanding. But this seems to be a bit vague. So I should tackle the issue more formally. To this end, let me introduce the following conventions. Let  $\mathcal{A}$  be an agent, who faces, let us suppose, a number of choice situations,  $C_1, \dots, C_n$  in her daily practice,

---

<sup>11</sup> I deliberately do not speak of a *moral* responsibility here because this would require that I explain that qualification. This task is harder than it looks. Cf. J. Nida-Rümelin (fn.1), Ch. XII.

$D$ . That is to say, there are  $n$  situations in which  $A$  can choose between at least two alternatives, such that she has to provide reasons for her choices in  $n$  cases. In order to make sense of the word “increase” in my above claim we need to make agential responsibility comparable across different practices  $D, D', D''$  and so on. To that end, let us stipulate that the choices,  $C_1, \dots, C_n$  that  $A$  faces in  $D$  create a measurable “amount” or “degree” of agential responsibility, which is denoted by  $R_A(D)$ .

Admittedly, it will be hard to compare all practices with regard to the amount of agential responsibility that they involve. However, there seem to be certain clear cases. Let us look at two of them. In these two cases  $A$ 's daily practice,  $D$ , is transformed into new practices,  $D'$  and  $D''$ , respectively, and the amount of  $A$ 's agential responsibility,  $R_A(D)$ , is transformed into  $R_A(D')$  and  $R_A(D'')$ , respectively. *Vis-à-vis*  $D, D'$  and  $D''$  are specified, respectively as follows:

*D is transformed into  $D'$* : A new choice option is introduced *ceteris paribus*, such that a new choice situation arises.  $A$  faces not only choice situations  $C_1, \dots, C_n$ . Instead, she faces an additional choice situation  $C_{n+1}$ .

*D is transformed into  $D''$* : A new choice option is introduced *ceteris paribus*, such that choice situations  $C_1, \dots, C_{i-1}, \dots, C_{i+1}, \dots, C_n$  remain unchanged. But there is (at least) one additional choice option that she can choose in situation  $C_i$ .

Both the transformation of  $D$  into  $D'$  and the transformation of  $D$  into  $D''$  undoubtedly increase the agential responsibility of the agent. That is,  $R_A(D') > R_A(D)$  and  $R_A(D'') > R_A(D)$ .

Why the former? To see this, we need to compare  $D'$  with  $D$ . Under  $D'$ ,  $A$  needs to provide reasons for her choices in  $C_1, \dots, C_n$  just like she did in  $D$ . In addition, though, she needs to provide reasons for her choice in situation  $C_{n+1}$ . This makes her new situation,  $D'$ , more demanding in terms of agential responsibility than the old situation,  $D$ . The requirement to justify what  $A$  does is more stringent under  $D'$  than it is under  $D$ . Hence,  $R_A(D') > R_A(D)$ .

Why the latter? Again, to see this we need to compare  $D''$  with  $D$ . Under  $D''$ ,  $A$  has to provide reasons for the actions she chooses in choice situations  $C_1, \dots, C_{i-1}, \dots, C_{i+1}, \dots, C_n$  and against the actions that she did not choose just like she did under  $D$ . In addition, she needs to give a further reason in situation  $C_i$  that justifies why she did or did not

choose the new option that has become available. This makes  $D''$  more demanding in terms of agential responsibility than  $D$ . And hence,  $R_A(D'') > R_A(D)$ .

With these preliminary remarks in mind, the argument for my claim is, in fact, straightforward. To the extent that technological progress is practically relevant it brings with it new options for acting, while all other options remain available.<sup>12</sup> It either enriches existing choice situations by giving us new choice options. E.g., when I want to travel from Munich to Hamburg I have a choice to travel by car, train, plane or, God forbid, by bus. Once the hyperloop becomes available I will have a further option.<sup>13</sup> This type of technological progress matches the transition from  $D$  to  $D'$ . A second possibility is that technological progress creates new choice options. NASA, e.g., were confronted with a choice as to whether or not they should send a person to the moon as soon as the technology that would allow them to do this became available. The change introduced by that kind of technology fits the transformation from  $D$  into  $D''$ . As I established above, both the transformation from  $D$  to  $D'$  and the transformation from  $D$  to  $D''$  increase our agential responsibility. This shows, then, that technological progress, to the extent that it is practically relevant, increases our agential responsibility.

#### 4. Technological progress and substantive responsibility

In this section, I will attempt to show how technological progress can affect both our substantive responsibilities and the way we think

<sup>12</sup> This claim may be doubted. It may be said that certain technological changes take away certain options for acting. E.g., now that everybody has a mobile phone we may say that not having one is “just not an option”. Though there is nothing wrong with taking that way in everyday life, it must be pointed out that the sense in which the word “option” is used here is different from the one intended. When we say about a particular course of action that it is “just not an option” we mean that choosing that it would have unacceptable consequences. In that sense, technological progress can take away options. However, it does not take away options in the sense that certain possibilities are eliminated.

<sup>13</sup> The Tesla Company has recently released a document which shows how the hyperloop would work. Available at <[http://www.teslamotors.com/sites/default/files/-blog\\_attachments/hyperloop\\_alpha3.pdf](http://www.teslamotors.com/sites/default/files/-blog_attachments/hyperloop_alpha3.pdf)> accessed 1 May 2014.

about them. To this end, it makes sense to distinguish, first of all, between two areas of ethics, *viz.* applied ethics and normative ethics.

Applied ethics may be defined as the application of moral theory and its methods to concrete moral problems. These problems involve a choice situation with various options for choice and an agent who can choose between them. In order to determine what the right choice – in other words, the responsibility of the agent – is, applied ethicists investigate the factors that speak in favour of the respective options and against them. They investigate, in other words, their *pro's* and *con's* and advise the agent to do that action which, on balance, is most favourable. Now as we have seen in the previous section, technological progress tends to add choice options. Agents who have access to new technologies can do new things or can do whatever they used to do in new ways. For this reason, technological progress may change their substantive responsibilities. This is, of course, not a matter of necessity. The mere fact that a new option has become available does not mean that the agent is normatively required to choose this option. Quite often, the new options for acting that technological progress makes available involve risks. And this may make it inadvisable to choose them. In other cases, however, new options may be best supported by reasons and may thus become normatively mandatory. And in these cases, technological progress changes our substantive responsibilities.

Let us look at an example by Peter Singer that illustrates the point. In his influential paper “Famine, Affluence, and Morality” (1972) Singer says that

[f]rom a moral point of view, the development of the world into a ‘global village’ has made an important, though still unrecognized, difference to our moral situation. Expert observers and supervisors, sent out by famine relief organizations or permanently stationed in famine-prone areas, can direct our aid to a refugee in Bengal almost as effectively as we could get it to someone in our own block.<sup>14</sup>

A few decades before Singer wrote these words, people were unable to help poor people in faraway places. They could only help their fellow neighbours, that is, the people in their immediate environment. Given

<sup>14</sup> P. Singer, ‘Famine, Affluence, and Morality’, *Philosophy and Public Affairs* 1(3), 229–243.

the progress in information technologies, however, funds can now be transferred around the Globe in no time. And there are infrastructures, which ensure that these funds are distributed fast and greatly impact the lives of those in need. Today we live, as Singer puts it, in a “global village.”<sup>15</sup> That means that almost every one of us now has it in their power to do a tremendous amount of good. This holds, in particular, for those who live in affluent Western countries. If you are from such a country, there is a fair chance that you should give much more than you currently do. You do not even have to be a utilitarian like Singer to arrive at that conclusion.<sup>16</sup> I, e.g., am from Germany, where only 47% of all people give money to charity. This places my country at number 27 in terms of money donations worldwide. It would be hard to argue that more than half of its population is too poor to give anything at all. After all, in Myanmar the number is 85%. And India, of all countries, has the largest absolute number of people who give to charity.<sup>17</sup> An applied ethicist like Singer may thus draw the conclusion that the technology-induced transformation of our world into a “global village” gives my fellow Germans a responsibility to do much more to help those in need than they currently do.

The way in which technological progress affects our responsibilities as human agents is, I think, rather obvious. Above I have, however, made a more far-reaching claim. I said that technological progress does not only affect our substantive responsibilities on a case-by-case basis. I maintained that it may also change the way we think about our responsibilities at the level of normative-ethical theory. Admittedly, this connection is less obvious. After all, normative ethics concerns, one may say, the fundamental makeup of our moral “reality”. Just like the laws of physics are reasonably seen as eternal and changeless, the basic principles that underlie our moral duties may be supposed to be unalterable. Though that may in fact be true, the changes that our

<sup>15</sup> The term “global village” is not, however, original to Singer. To my knowledge, it was coined by Herbert Marshall McLuhan in the book *The Gutenberg Galaxy* (Toronto: University of Toronto Press, 1962).

<sup>16</sup> My colleague Jan-Christoph Heilinger has, e.g., argued for far-reaching moral obligations based on human welfare rights. See J.-C. Heilinger, ‘The moral demandingness of socioeconomic human rights’, in G. Ernst, J.-C. Heilinger, *The philosophy of human rights. Contemporary controversies* (Berlin/Boston: de Gruyter, 2012), 185–208.

<sup>17</sup> I take these figures from the *World Giving Index 2013* of the Charity Aid Foundation (CAF), which is available at: <[https://www.cafonline.org/pdf/WorldGivingIndex-2013\\_1374AWEB.pdf](https://www.cafonline.org/pdf/WorldGivingIndex-2013_1374AWEB.pdf)> accessed 1 May 2014.

empirical world undergoes – and that includes technological changes – may nevertheless change the way we *think* about the issues that lie at the heart of normative ethics.<sup>18</sup> And to that extent, these changes may have an impact on the discipline of normative ethics and on the conclusions at which we arrive in that discipline. This, in a nutshell, is the reasoning behind the claim that technological progress can affect the way we think about our substantive responsibilities. Perhaps it is not entirely satisfactory, though. For it remains to be explained *how* technological advances can affect the way we think about normative ethics. To explain this, I should, first of all, say a few words about the way in which modern normative ethics commonly proceeds.

Right off, I should emphasize that normative-ethical theorists have by and large distanced themselves from the views of the systematic moral thinkers, such as Kant, Mill, Sidgwick and so on.<sup>19</sup> They believed that the whole content of morality could be deduced from a single principle (or a number thereof). Like in physics, experiments of sorts nowadays play a fundamental role in normative ethics. While physicists test the laws that are suspected to underlie the workings of the cosmos against empirical observation, ethical theorists test their theories against cases. These are usually hypothetical thought experiments (e.g. trolley cases). But they can also be examples that are taken from our real world. In both cases, the standard procedure is roughly as follows. A philosopher considers an example – either hypothetical or real – of a situation in which an agent faces a morally significant choice or acts in ways that call for moral evaluation. Then, she probes into our moral intuitions about that case. She investigates, e.g., which of the choice options strike us as permissible, obligatory or forbidden. After that, she turns to the various contestants in the race for the best moral theory – say, Kantianism, utilitarianism, virtue ethics and so on – and analyses their implications for the case at hand. Finally, she compares our moral intuitions to the implications that the respective theory yields. The

<sup>18</sup> Arguably, this is also true for artistic characterizations of technology (e.g. in film). On this point, see N. Mukerji, 'Why Moral Philosophers Should Watch Sci-Fi Movies', in (forthcoming) F. Battaglia, N. Weidenfeld (eds.), *Roboethics in Film* (Pisa: Pisa University Press).

<sup>19</sup> On this point, see J. Nida-Rümelin, *Philosophie und Lebensform* (Frankfurt a. M.: Suhrkamp, 2009), 194–221. See, furthermore, N. Mukerji, J. Nida-Rümelin, 'Towards a Moderate Stance on Human Enhancement', in (in press) *Humana.mente – Journal of Philosophical Studies*.

theory whose implications are best in line with our intuitions is the one that may count as corroborated by the case at hand.

This is admittedly a very sketchy depiction of what goes on when normative-ethical theorists go about their business. But it suffices to explain what I am seeking to explain, *viz.* how technological advances can affect our normative-ethical thinking and the substantive responsibilities that follow from it. As I explained above, technological progress changes the empirical circumstances in which we act. We are able to do new things or do the same things in new ways. This gives rise to new moral scenarios, which may provide new test cases for the theories that we discuss in normative ethics. Their tenability will depend, at least in part, on how well they can cope with the new scenarios that we encounter as our technologies advance. And, obviously, the substantive responsibilities that follow from them will, too. This shows, then, that technological progress does not only affect our responsibilities in concrete cases. It may also affect the way we think about them at a theoretical level.

Singer's stance in "Famine, Affluence, and Morality" can once again be used as illustrative material. As I said above, Singer believes that most people in affluent Western countries should do much more than they currently do to help the poor. Technological progress has transformed the world into a "global village" where affluent individuals are perfectly able to make a great difference in the lives of those in need. They should choose to do this rather than to spend their money on luxury items that they do not really need. Singer says this as an applied ethicist. He essentially explains how, in his view, technological progress affects our substantive responsibilities in a concrete situation. But what he says also holds a lesson for a normative ethicist. If you find Singer's judgement plausible, if you also believe that the rich have a responsibility to do much more than they currently do to help the poor, then you should use this insight for normative-ethical purposes, too. You should investigate the implications of various theories of substantive responsibility in Singer's case and compare them to the judgement that you find plausible. If they imply that judgement, this constitutes one reason to accept them. If they do not, this constitutes a reason not to accept them. On the other hand, if you reject Singer's view, then you may proceed in the opposite way. You may check which moral theories support Singer's judgement and take this to be a reason for rejecting them. At this point, I am not interested in whether or not

Singer's judgement is correct. In either case you can use his analysis of the way in which technological progress changes our responsibilities to the global poor as data for normative-ethical theorizing. And this illustrates what I claimed, *viz.* that concrete cases of technological developments can influence the way we think about our substantive responsibilities at the theoretical level.

## 5. Conclusion

In this paper, I analysed the relation between technological progress and responsibility. I started out by distinguishing between two concepts of responsibility, *viz.* responsibility as attributability and substantive responsibility. I argued that our responsibility as attributability, which we satisfy by giving convincing reasons for our choices, increases as technology progresses since technological progress increases our options and thus confers upon us a more stringent requirement to justify what we do. Then, I went on to show that technological progress can furthermore affect our substantive responsibilities. That is to say, it can affect what we are required to do. And it may, in fact, add rather demanding requirements. I illustrated this using the "global village" and our obligations to the poor in faraway places as an example. Technological progress in information technology has given us the option to help those in need. Given that we have this option and can help very easily, much can be said to support the view that we therefore have a far-reaching responsibility to help. In addition, I argued that technological change can affect not only the substantive content of our responsibilities but also the way we think about them from a theoretical standpoint. It may provide new test cases for our normative theories of substantive responsibility.

Developments in technology are, of course, interesting in and of themselves. But given what I have argued, it seems reasonable to think that ethicists in particular should take an interest in technology as it gives rise to stimulating questions in both applied and normative ethics.

# Ethics and the regulation of technological applications in Europe

*Benedetta Bisol*

## 1. Introduction

This article presents some reflections on the governance of science and technology in the European Union, considering this topic from a philosophical point of view. The main subject of the article is to discuss currently adopted strategies of ethical regulation in the fields of research, production and use of technological applications as well as some limits and difficulties related to these strategies. The main goal of my analysis is to show how ethics as a philosophical discipline can help today to draw up a regulating framework for science and technology with particular regard to new and emerging technologies.

At first glance, it seems to be possible to define the ethics of technology as a field of knowledge that can be clearly distinguished from the scientific knowledge about technology, according to the following criterion: ethics gives us a repertoire of theoretical models, notions and methods which allows us to distinguish between good and bad, right and wrong use of technologies; on the other hand, technical options are neutral in axiological terms. Accordingly, when we refer to the scientific knowledge of a technological object, we merely describe how it functions and how we can use it. Following this approach, the main contribution of ethics in the field of science and technology lies in providing useful conceptual and methodological tools for the development of an adequate ethical analysis, which can also support legal regulation, only if it is open to the interdisciplinary dialogue with science and technology: ethics teaches us about the ethical implications of the use of technology, but does it by referring to other fields of knowledge that are outside its epistemic dominion. I agree with the relevance of interdisciplinary work and with the contribution which ethics can give *within* the ethical debate about technology. However, I