Morality in Design

Design Ethics and the Morality of Technological Artifacts

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Abstract A core issue in the philosophy of technology has been the non-neutrality of technology. Most scholars in the field agree that technologies actively help to shape culture and society, rather than being neutral means for realizing human ends. How to take seriously this non-neutrality of technology in ethics? Engineering ethics mainly focuses on the moral decisions and responsibilities of designers, and remains too external to the moral significance of technologies themselves. Yet, analyses of the non-neutrality of technology make it plausible to ascribe some morality to artifacts. First of all, technologies substantially contribute to the coming about of actions and of decisions about how to act. Second, their role cannot be entirely reduced to the intentions behind their design and use. This paper investigates what these observations imply for ethical theory, and for the ethics of design.

1 Expanding the Ethics of Technology

In our technological culture, ethical issues regarding technology are receiving ever more attention and weight. A few decades ago, normative reflection on technology was highly abstract, criticizing 'technology' as such, and its impact on society and culture, like the advent of a 'one-dimensional man' (Marcuse), 'mass-rule' (Jaspers), and 'mastery and control over nature' (Heidegger). Over time, normative reflection has sought closer contact with technologies themselves. Not only did applied fields like ethics of information technologies and ethics of biomedical technology come into being; the ethics of technology has also started to reflect on the very design of technologies. Branches like engineering ethics and ethics of design aim to provide engineers and designers with vocabularies, concepts and theories that they can use to make responsible decisions in the practice of technology development.

This movement toward more contact with technologies themselves can be taken one step further. In its current form, engineering ethics and the ethics of design tend

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P. E. Vermaas et al. (eds.), *Philosophy and Design*.

to follow a somewhat externalist approach to technology. The main focus is on the importance of taking individual responsibility ('whistle blowing') to prevent technological disasters, and on methods that can be used to assess and balance the risks accompanying new technologies. Favorite cases studies concern technologies which have caused a lot of problems that could have been prevented by responsible actions of engineers, like the exploding space shuttle "Challenger", or the Ford Pinto with its rupturing gas tank in crashes over 25 miles per hour. Case studies like these approach technology in a merely instrumental way. They address technologies in terms of their functionality: technologies are designed to do something, and if they fail to do so properly, they are badly designed. What such case studies fail to take into account are the impacts of such technologies on our moral decisions and actions, and on the quality of our lives.

When technologies are used, they always help to shape the context in which they fulfill their function. They help to shape human actions and perceptions, and create new practices and ways of living. This phenomenon has been analyzed as 'technological mediation': technologies mediate the experiences and practices of their users (Latour, 1992; Ihde, 1990; Verbeek, 2005). Such technological mediations have at least as much moral relevance as technological risks and disaster prevention. Technologies help to shape the quality of our lives and, more importantly, they help to shape our moral actions and decisions. Cell phones, e.g., contribute explicitly to the nature of our communications and interactions; and technologies like obstetric ultrasound play active roles in the decisions we make regarding unborn life. In order to address the moral aspects of technology development adequately, the ethics of technology should expand its approach to technology to include technological mediation and its moral relevance, enabling designers to take responsibility for the quality of the functioning of their designs, and for the built-in morality. In this chapter I will first explore how this moral relevance of technological devices can be conceptualized. After that, I will elaborate how it can be incorporated in the ethics of technology.

2 Do Artifacts have Morality?

The question of the moral significance of technological artifacts has been playing a role on the backbenches of the philosophy of technology for quite some time now. As early as 1986 Langdon Winner asked himself: "Do artifacts have politics?" This question was grounded in his analysis of a number of 'racist' overpasses in New York, which were deliberately built so low that only cars could pass beneath them, but not buses, thus preventing the dark-skinned population, unable to afford a car, from accessing the beach (Winner, 1986). Bruno Latour (1992) subsequently argued that artifacts are bearers of morality as they constantly help people to take all kinds of moral decisions. For example, he shows that the moral decision of how fast one drives is often delegated to a speed bump in the road with the script 'slow down before reaching me'. Anyone complaining about deteriorating morality,

according to Latour, should use their eyes better, as the objects around us are crammed with morality.[1]

Many of our actions and interpretations of the world are co-shaped by the technologies we use. Telephones mediate the way we communicate with others, cars help to determine the acceptable distance from home to work, thermometers co-shape our experience of health and disease, and antenatal diagnostic technologies generate difficult questions regarding pregnancy and abortion. This mediating role of technologies also pertains to actions and decisions we usually call 'moral', ranging from the driving speed we find morally acceptable to our decisions about unborn life. If ethics is about the question 'how to act', and technologies help to answer this question, technologies appear to do ethics, or at least to help us to do so. Analogously to Winner's claim that artifacts have politics, therefore, the conclusion seems justified that artifacts have morality: technologies play an active role in moral action and decision-making.

How can we understand this material morality? Does it actually imply that artifacts can be considered moral agents? In ethical theory, to qualify as a moral agent at least requires the possession of *intentionality* and some degree of *freedom*. In order to be held morally accountable for an action, an agent needs to have the intention to act in a specific way, and the freedom to realize this intention. Both requirements seem problematic with respect to artifacts, at least, at first sight. Artifacts, after all, do not seem to be able to form intentions, and neither do they possess any form of autonomy. Yet, both requirements for moral agency deserve further analysis.

2.1 Technological Intentionality

At a first glance, it might seem absurd to speak about artifacts in terms of intentionality. A closer inspection of what we mean by 'intentionality' in relation to what artifacts actually 'do', however, makes it possible to attribute a specific form of intentionality to artifacts. To show this, it is important to make a distinction here between two aspects of 'intentionality.' One, intentionality entails the ability to *form intentions*, and two, this forming of intentions can be considered something *original* or *spontaneous* in the sense that it literally 'springs from' or is 'originated by' the agent possessing intentionality. Both aspects of intentionality will appear not to be as alien to technological artifacts as at first they might seem.

First, the 'mediation approach' to technology, already mentioned above, makes it possible to attribute to artifacts the ability to form intentions. In this approach, technologies are analyzed in terms of their mediating roles in relations between humans and reality. The core idea is that technologies, when used, always establish a relation between users and their environment. Technologies enable us to perform

[1] For other analyses of the moral relevance of technological artifacts, see Borgmann (1995) and Achterhuis (1995).

actions and have experiences that were scarcely possible before, and in doing so, they also help us to shape *how* we act and experience things. Technologies are not neutral instruments or intermediaries, but active mediators that help shape the relation between people and reality. This mediation has two directions: one pragmatic, concerning action, and the other hermeneutic, concerning interpretation.

Latour's work offers many examples of the pragmatic dimension of technological mediation. With Madeleine Akrich, he coined the term 'script' to indicate that artifacts can prescribe specific actions, just like the script of a film or play which prescribes who does what and when (Latour, 1992; Akrich, 1992). The speed bump mentioned above, for instance, embodies the script 'slow down before reaching me'. Everyday life is loaded with examples of technologies that help to shape our actions. In Dutch supermarkets, shopping carts are equipped with a coin lock, to encourage users to put the cart back in place rather than leaving it at the parking lot. Recently, carts have been introduced with a wheel lock blocking the wheels when the cart is moved outside a designated area, thus preventing it from being stolen.

Don Ihde's work concerns the hermeneutic dimension of technological mediation. Ihde analyzes the structure of the relations between human beings and technological artifacts, and investigates how technologies help to shape, on the basis of these relations, human perceptions and interpretations of reality (e.g., Ihde, 1990; 1998). A good example to illustrate this hermeneutic intentionality, which I have already briefly elaborated elsewhere (see Verbeek, 2006), is obstetrical ultrasound. This technology is not simply a functional means to make visible an unborn child in the womb. It actively helps to shape the way the unborn child is seen in human experience, and in doing so it informs the choices his or her expecting parents make. Because of the ways in which ultrasound mediates the relations between the fetus and the future parents, it constitutes both the fetus and parents in specific ways.

Ultrasound brings about a number of 'translations' of the relations between expecting parents and the fetus, while mediating their visual contact. One, ultrasound isolates the fetus from the female body. In doing so, it creates a new ontological status of the fetus, as a separate living being rather than forming a unity with his or her mother. This creates the space to make decisions about the fetus apart from the pregnant woman in whose body it is growing. Two, ultrasound places the fetus in a context of medical norms. It makes visible defects of the neural tube, and makes it possible to measure the thickness of the fetal neck fold, which gives an indication of the risk that the child will suffer from Down's Syndrome. In doing so, ultrasound translates pregnancy into a medical process; the fetus into a possible patient; and congenital defects into preventable suffering. As a result, pregnancy becomes a process of choices: the choice to have tests like neck fold measurements done at all, and the choice of what to do if anything is 'wrong'. Moreover, parents are constituted as decision-makers regarding the life of their unborn child. To be sure, the role of ultrasound is ambivalent here: on the one hand it may encourage abortion, making it possible to prevent suffering; on the other hand it may discourage abortion, enhancing emotional bonds between parents and the unborn child by visualizing 'fetal personhood'.

In all of these examples, artifacts are active: they help to shape human actions, interpretations, and decisions, which would have been different without the artifact. To be sure, artifacts do not have intentions like human beings do, because they cannot *deliberately* do something. But their lack of consciousness does not take away the fact that artifacts can have intentions in the literal sense of the Latin word 'intendere', which means 'to direct', 'to direct one's course', 'to direct one's mind'. The intentionality of artifacts is to be found in their directing role in the actions and experiences of human beings. Technological mediation, therefore, can be seen as a specific, material form of intentionality.

With regard to the second aspect of intentionality, the 'originality' of intentions, a similar argumentation can be given. For even though artifacts evidently cannot form intentions entirely on their own, again because of their lack of consciousness, their mediating roles cannot be entirely reduced to the intentions of their designers and users either. Otherwise, the intentionalities of artifacts would be a variant of what Searle denoted 'derived intentionality' (Searle, 1983), entirely reducible to human intentionalities. Quite often, technologies mediate human actions and experiences without human beings having told them to do so. Some technologies, for instance, are used in different ways from those their designers envisaged. The first cars, which only made 15 km/h, were used primarily for sport, and for medical purposes; driving at a speed of 15 km/h was considered to create an environment of 'thin air', which was supposed be healthy for people with lung diseases. Only after cars were interpreted as a means for providing long distance transport did the car get to play its current role in the division between labor and leisure (Baudet, 1986). In this case, unexpected mediations come about in specific use contexts. But unforeseen mediations can also emerge when technologies are used as intended. The very fact that the introduction of mobile phones has led to changes in youth culture – such as that young people appear to make ever less appointments with each other, since everyone can call and be called at any time and place – was not intended by the designers of the cell phone, even though it is used here in precisely the context the designers had envisaged.

It seems plausible, then, to attribute a specific form of intentionality to artifacts. This 'material' form of intentionality is quite different from human intentionality, in that it cannot exist without human intentionalities supporting it. Only within the relations between human beings and reality can artifacts play their 'intending' mediating roles. When mediating the relations between humans and reality, artifacts help to constitute both the objects in reality that are experienced or acted upon and the subjects that are experiencing and acting. This implies that the subjects who act or make decisions about actions are never purely human, but rather a complex blend of humanity and technology. When making a decision about abortion on the basis of technologically mediated knowledge about the chances that the child will suffer from a serious disease, this decision is not 'purely' human, but neither is it entirely induced by technology. The very situation of having to make this decision and the very ways in which the decision is made, are co-shaped by technological artifacts. Without these technologies, either there would not be a situation of choice, or the decision would be made on the basis of a different relation to the situation. At the same time, the

technologies involved do not *determine* human decisions here. Moral decision-making is a joint effort of human beings and technological artifacts.

Strictly speaking, then, there is no such thing as 'technological intentionality'; intentionality is always a hybrid affair, involving both human and nonhuman intentions, or, better, 'composite intentions' with intentionality distributed over the human and the nonhuman elements in human-technology-world relationships. Rather than being 'derived' from human agents, this intentionality comes about in associations between humans and nonhumans. For that reason, it could be called 'hybrid intentionality', or 'distributed intentionality'.

2.2 Technology and Freedom

What about the second requirement for moral agency we discerned at the beginning of this chapter: freedom, or even autonomy? Now that we have concluded that artifacts may have some form of intentionality, can we also say that they have *freedom*? Obviously not. Again, freedom requires the possession of a mind, which artifacts do not have. Technologies, therefore, cannot be free agents like human beings are. Nevertheless there are good arguments not to exclude artifacts entirely from the realm of freedom that is required for moral agency. In order to show this, I will first elaborate that human freedom in moral decision-making is never absolute, but always bound to the specific situations in which decisions are to be made, including their material infrastructure. Second, I will argue that in the human-technology associations that embody hybrid intentionality, freedom should also be seen as distributed over the human and nonhuman elements in the associations.

Even though freedom is obviously needed to be accountable for one's actions, the thoroughly technologically mediated character of our daily lives makes it difficult to take freedom as an absolute criterion for moral agency. After all, as became clear above, technologies play an important role in virtually every moral decision we make. The decision how fast to drive and therefore how much risk to run of harming other people is always mediated by the lay-out of the road, the power of the engine of the car, the presence or absence of speed bumps and speed camera's, et cetera. The decision to have surgery or not is most often mediated by all kinds of imaging technologies, blood tests et cetera, which help us to constitute the body in specific ways, thus organizing specific situations of choice.

To be sure, moral agency does not necessarily require complete autonomy. Some degree of freedom can be enough to be held morally accountable for an action. And not all freedom is taken away by technological mediations, as the examples of abortion and driving speed make clear. In these examples, human behavior is not determined by technology, but rather co-shaped by it, with humans still being able to reflect on their behavior and make decisions about it. This does not take away the fact, however, that most mediations, like those provided by speed bumps and by the presence of ultrasound scanners as a common option in medical practice, occur in a pre-reflexive manner, and can in no way be escaped in moral decision-making. The moral dilemmas

of whether or not to have an abortion and of how fast to drive would not exist in the same way without the technologies involved in these practices, such dilemma's are rather *shaped* by these technologies. Technologies cannot be defined away from our daily lives. The concept of freedom presupposes a form of sovereignty with respect to technology that human beings simply no longer possess.

This conclusion can be read in two distinct ways. The first is that mediation has nothing to do with morality whatsoever. If moral agency requires freedom and technological mediation limits or even annihilates human freedom, only non-technologically mediated situations leave room for morality. Technological artifacts are unable to make moral decisions, and technology-induced human behavior has a non-moral character. A good example of this criticism are the commonly heard negative reactions to explicit behavior-steering technologies like speed limiters in cars. Usually, the resistance against such technologies is supported by two kinds of arguments. One, there is the fear that human freedom is threatened and that democracy is exchanged for technocracy. Should all human actions be guided by technology, the criticism goes, the outcome would be a technocratic society in which moral problems are solved by machines instead of people. Two, there is the charge of immorality or, at best, amorality. Actions not the product of our own free will but induced by technology can not be described as 'moral'; and, what is worse, behavior-steering technologies might create a form of moral laziness that is fatal to the moral abilities of citizens.

These criticisms are deeply problematic. The analyses of technological mediation given above show that human actions are *always* mediated. To phrase it in Latour's words: "Without technological detours, the properly human cannot exist. (…) Morality is no more human than technology, in the sense that it would originate from an already constituted human who would be master of itself as well as of the universe. Let us say that it traverses the world and, like technology, that it engenders in its wake forms of humanity, choices of subjectivity, modes of objectification, various types of attachment." (Latour, 2002). This is precisely what opponents of speed limitation forget. Also without speed limiters, the actions of drivers are continually mediated: indeed, cars can easily exceed speed limits and because our roads are so wide and the bends so gentle that we can drive too fast, we are constantly invited to explore the space between the accelerator and the floor. Therefore, giving the inevitable technological mediations a desirable form rather than rejecting outright the idea of a 'moralized technology' in fact attests to a sense of responsibility.

The conclusion that mediation and morality are at odds with each other, therefore, is not satisfying. It is virtually impossible to think of any morally relevant situation in which technology does not play a role. And it would be throwing out the baby with the bathwater to conclude that there is no room for morality and moral judgments in all situations in which technologies play a role. Therefore, an alternative solution is needed of the apparent tension between technological mediation and ethics. Rather than taking absolute freedom as a prerequisite for moral agency, we need to reinterpret freedom as an agent's ability to relate to what determines him or her. Human actions always take place in a stubborn reality, and for this

reason, absolute freedom can only be attained by ignoring reality, and therefore by giving up the possibility to act at all. Freedom is not a lack of forces and constraints; it rather is the existential space human beings have within which to realize their existence. Humans have a relation to their own existence and to the ways in which this is co-shaped by the material culture in which it takes place. The material situatedness of human existence *creates* specific forms of freedom, rather than impedes them. Freedom exists in the possibilities that are opened up for human beings to have a relationship with the environment in which they live and to which they are bound.

This redefinition of freedom, to be sure, still leaves no room to actually attribute freedom to technological artifacts. But it does take artifacts back into the realm of freedom, rather than excluding them from it altogether. On the one hand, after all, they help to *constitute* freedom, by providing the material environment in which human existence takes place and takes its form. And on the other hand, artifacts can enter associations with human beings, while these associations, consisting partly of material artifacts, are the places where freedom is to be located. For even though freedom is never absolute but always gets shaped by technological and contextual mediations, these very mediations also create the space for moral decision-making. Just like intentionality, freedom also appears to be a hybrid affair, most often located in associations of humans and artifacts.

2.3 Conclusion: Materiality and Moral Agency

This expansion of the concepts of intentionality and freedom might raise the question if we really need to fiddle with such fundamental ethical concepts to understand the moral relevance of technological artifacts. In order to show that the answer to this question is yes, we can connect to an example elaborated by Latour: the debate between the National Rifle Association in the USA and its opponents. In this debate, those opposing the virtually unlimited availability of guns in the USA use the slogan “Guns Kill People”, while the NRA replies with the slogan “Guns don’t kill people; people kill people” (Latour, 1999, 176).

The NRA position seems to be most in line with mainstream thinking about ethics. If someone is shot, nobody would ever think about keeping the gun responsible for this. Yet, the anti-gun position evidently also has a point here: in a society without guns, fewer fights would result in murder. A gun is not a mere instrument, a medium for the free will of human beings; it helps to define situations and agents by offering specific possibilities for action. A gun constitutes the person holding the gun as a potential gunman and his or her adversary as a potential lethal victim. Without denying the importance of human responsibility in any way, this example illustrates that when a person is shot, agency should not be located exclusively in either the gun or the person shooting, but in the assembly of both.

The example, therefore, illustrates that we need to develop a new perspective of both concepts. It does not imply that artifacts can ‘have’ intentionality and

freedom, just like humans are supposed to have. Rather, the example shows that (1) intentionality is hardly ever a purely human affair, but most often a matter of human-technology associations; and (2) freedom should not be understood as the absence of 'external' influences on agents, but as a practice of *dealing* with such influences or mediations.

3 Designing Material Moralities

This analysis of the moral agency of technological artifacts has important implications for the ethics of technology and technology design. First, the mediation approach to technology makes clear that moral issues regarding technology development comprise more than weighing technological risks and preventing disasters, however important these activities are. What is also at stake when technologies are introduced in society are the ways in which these technologies will mediate human actions and experiences, thus helping to form our moral decisions and our quality of life. The ethics of technology design, therefore, should also occupy itself with taking responsibility for the future mediating roles of technologies-in-design.

Moreover, our analysis of technological mediation shows that, even without explicit moral reflection, technology design is inherently a moral activity. Designers, by designing artifacts that will inevitably play a mediating role in people's actions and experience, are thus helping to shape (moral) decisions and practices. Designers 'materialize morality'; they are 'doing ethics by other means' (cf. Verbeek, 2006). This conclusion makes it even more urgent to expand the scope of the ethics of technology to include the moral dimensions of the artifacts themselves, and to try and give shape to these dimensions in a responsible way.

3.1 Designing as Combining Agencies

In practice, however, taking this responsibility runs into a number of serious problems. One, to 'build in' particular mediations, or to eliminate undesirable ones, it is necessary to predict what mediating roles technologies-in-design will play in their future use contexts, while there is no univocal relationship between the activities of designers and the eventual mediating role of the products they design. Technological mediations are no intrinsic qualities of technologies, but are brought about in complex interactions between designers, users, and the technologies. As became clear above, technologies can be used in unforeseen ways, and therefore are able to play unforeseen mediating roles. The energy-saving light bulb is another example of this, having actually resulted in increased energy consumption since such bulbs often appear to be used in places previously left unlit, such as in the garden or on the façade of a house, thereby canceling out their economizing effect (Steg, 1999; Weegink, 1996). Moreover, unintentional and unexpected forms of mediation can arise when technologies

are used in the way their designers intended. A good example is the revolving door which keeps out both cold air and wheelchair users. In short, designers play a seminal role in realizing particular forms of mediation, but not the only role. Users with their interpretations and forms of appropriation also have a part to play; and so do technologies, which give rise to unintended and unanticipated forms of mediation. These complicated relations between technologies, designers, and users in the mediation of actions and interpretations are illustrated in figure 1.

The figure makes clear that in all human actions, and all interpretations informing moral decisions, three forms of agency are at work: (1) the agency of the human being performing the action or making the moral decision, in interaction with the technology, and also appropriating the technological artifact in a specific way; (2) the agency of the designer who, either implicitly or in explicit delegations, gives a specific shape to the artifact used, and thus helps to shape the eventual mediating role of the artifact; and (3) the agency of the artifact mediating human actions and decisions, sometimes in unforeseen ways. Taking responsibility for technological mediation, therefore, comes down to entering into an interaction with the agency of future users and the artifact-in-design, rather than acting as a 'prime mover' (cf. Smith, 2003).

The fundamental unpredictability of the mediating role of technology that follows from this does not imply that designers are by definition unequipped to deal with it. In order to cope with the unpredictability and complexity of technological mediation, it is important to seek links between the design context and the future use context. Design specifications should be derived from the product's intended function and from an informed prediction of the product's mediating roles and a moral assessment of these roles. A key tool to bring about this coupling of design context and use context, however trivial it may sound, is the designer's moral imagination. A designer can include the product's mediating role in his or her moral assessment during the design phase by trying to imagine the ways the technology-in-design could be used and by shaping user operations and interpretations from that perspective. Performing a mediation analysis (cf. Verbeek, 2006) can form a good basis for doing this. It cannot be guaranteed that designers will be able to anticipate all relevant mediations in this way, but it is the maximum designers can do to take responsibility for the mediating roles of their products.

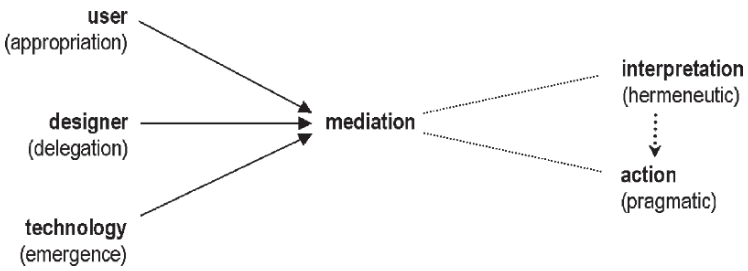

Fig. 1 Origins of technological mediation

3.2 Taking Mediation into Ethics

There are two ways to take mediation analyses into the ethics of technology and design. One, they can be used to develop moral assessments of technologies in terms of their mediating roles in human practices and experiences. Two, the conclusion that artifacts do have a specific form of morality also shifts ethics from the domain of language to that of materiality. When artifacts have moral relevance and embody a specific form of moral agency, ethics cannot only occupy itself with developing conceptual frameworks for moral reflection, but should also engage in the development of the material environments that helps to form moral action and decision-making. Hans Achterhuis has called this the 'moralization of technology' (Achterhuis, 1995).

The first way to take mediation into ethics is closest to common practices in the ethics of technology. It comes down to an augmentation of the current focus on risk assessment and disaster prevention. Rather than focusing on the acceptability and preventability of negative consequences of the introduction of new technologies, it aims to assess the impact of the mediating capacities of technologies-in-design for human practices and experiences. When an action-ethical approach is followed, moral reflection is directed at the question of whether the actions resulting from specific technological mediations can be morally justified. This reflection can take place along deontological or consequentialist lines. But in many cases, a virtue-ethical or life-ethical approach is at least as fruitful for assessing technological mediations, focusing on the quality of the *practices* that are introduced by the mediating technologies, and their implications for the kind of life we are living. It is not only the impact of mediation on specific human actions that is important then, but also the ways in which mediating technologies help to constitute human beings, the world they experience, and the ways they act in this world. To return to the example of ultrasound again: rather than merely assessing the impact of routine ultrasound scans in obstetrical health care in terms of safety and abortion rates, a life-ethical approach would try to assess the quality of the practices that arise around ultrasound scanning, in which the fetus and its expecting parents are constituted in specific ways, as possible patients versus decision-makers, and in specific relations to each other, i.e., in situations of choice.

The second way to augment the ethics of technology with the approach of technological mediation is to *assess* mediations, and to try to help *shape* them. Rather than working from an external standpoint *vis-à-vis* technology, aiming at rejecting or accepting new technologies, the ethics of technology should aim to *accompany* technological developments (Hottois), experimenting with mediations and finding ways to discuss and assess how one might deal with these mediations, and what kinds of living-with-technology are to be preferred. Deliberately building mediations into technological artifacts is a controversial thing to do, however. Behavior-steering technologies are seldom welcomed cordially, as the regular destruction of speed cameras illustrates.[2] However, since we have seen that *all*

[2] For a closer analysis of behavior-steering technologies see Verbeek and Slob (2006).

technologies inevitably mediate human-world relations, thus shaping moral actions and decisions, this should not imply that ethics should refrain from explicitly designing mediations into artifacts. It rather shows that ethics should deal with these mediations in a responsible way, and try to help design technologies with morally justifiable mediating capacities.

The contested nature of behavior-steering technology makes clear that such 'materializations of morality' cannot be left to the responsibility of individual designers. The actions and decisions of designers always have public consequences, and therefore these decisions and their consequences should be subject to public decision-making. The products of the designing work then literally become 'public things', in the sense of *res publica*, as recently elaborated by Latour (2005). 'Res', the Latin word for 'thing', also meant 'gathering place', or 'that which assembles', and even indicated a specific form of parliament. 'Things' can thus be interpreted as entities that gather people and other things around them, uniting them and making them differ. Seen in this way, technological artifacts not only help to shape our lives and our subjectivities, they should also be approached as foci around which humans gather in order to discuss and assess their concerns about the ways in which these things contribute to their existence. These are precisely the places where the morality of design should be located.[3]

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[3] This article was written with financial support from NWO, the Netherlands Organization for Scientific Research (innovational research incentive, "veni" track').

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