Obstetric Ultrasound and the Technological Mediation of Morality: A Postphenomenological Analysis

Peter-Paul Verbeek

Abstract This article analyzes the moral relevance of technological artifacts and its possible role in ethical theory, by taking the postphenomenological approach that has developed around the work of Don Ihde into the domain of ethics. By elaborating a postphenomenological analysis of the mediating role of ultrasound in moral decisions about abortion, the article argues that technologies embody morality and help to constitute moral subjectivity. This technological mediation of the moral subject is subsequently addressed in terms of Michel Foucault's ethical position, in which ethics is about actively co-shaping one's moral subjectivity. Integrating Foucauldian ethics and postphenomenology, the article argues that the technological mediation of moral subjectivity should be at the heart of an ethical approach that takes the moral dimensions of technology seriously.

Keywords Ethics of technology · Philosophy of technology · Postphenomenology · Michel Foucault · Obstetric ultrasound

Introduction

During the past decades, the philosophy of technology has been an important construction site for a new branch of phenomenology. Primarily inspired by the work of Don Ihde, phenomenological philosophy of technology broke away from its one-dimensional opposition to science and technology as second-order and alienating ways to relate to reality (cf. Ihde 1990). By developing analyses of the structure of the relations between humans and technologies, and by investigating the actual roles of technologies in human experience and existence, phenomenology

P.-P. Verbeek (✉)
Department of Philosophy, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands
e-mail: p.p.c.c.verbeek@utwente.nl

came to analyze technology as a constitutive part of the lifeworld rather than as a threat to it. The new phenomenological approach that came into being has been called "postphenomenological," because of its opposition to some aspects of "classical" phenomenology, as I will elaborate below.

In this article, I will explore the illuminating power of the postphenomenological approach by taking it into the realm of ethics. Ethics and phenomenology have always had only loose connections. Yet, the postphenomenological analysis of the technological mediation of human praxis and experience makes phenomenology immediately relevant for ethics. An analysis of the mediating role of obstetric ultrasound in the relations between expecting parents and unborn child will show that technologies help to shape practices and interpretations of reality which form the basis of moral decisions.

This conclusion urges us to rethink both the status of the object and the status of the subject in ethical theory. Within the predominant ethical frameworks it is not only difficult to assign moral agency to inanimate objects, but also to consider behavior resulting from technological mediation as "moral actions." Such actions are not the product of deliberate and free decisions, after all, but induced by external factors. An analysis of the late work of Foucault will serve as a starting point to develop a notion of the moral subject that incorporates the mediated character of subjectivity. Foucault's investigations of moral subject constitution appear to go well with the postphenomenological analysis of the technological mediation of subjectivity.

Phenomenology and Ethics

From Phenomenology to Postphenomenology

Postphenomenology aims to revive the phenomenological tradition in a way that overcomes the problems of classical phenomenology. These problems mainly concern what Ihde calls its "foundational" character (1998, pp. 113–126). Classical phenomenology explicitly defined itself as an alternative to science. As opposed to the scientific goal to *analyze* reality, phenomenology aimed to *describe* it (Merleau-Ponty 1962, pp. viii–x). This claim to provide a "more authentic" way of accessing reality has become highly problematic in the light of developments in 20th century philosophy, which have shown the mediated character and contextuality of such claims.

The fact that classical phenomenology failed to take the locality and context dependence of human knowledge into account is understandable when the context in which it developed is taken into account (cf. Verbeek 2005, pp. 106–108). Phenomenology presented itself as a philosophical method that sought to describe "reality itself," since it opposed itself to the absolutization of the positivistic view of the world arising from modern natural science, which claims to describe reality as it actually is. But the way in which phenomenology proceeded to develop its alternative to science, did not in fact result in a competing way of *describing* reality, but rather in an analysis of the *relations* between humans and reality. Maurice

Merleau-Ponty analyzed this relation primarily in terms of perception, Edmund Husserl in terms of human consciousness, and Martin Heidegger in terms of being-in-the-world. It is, therefore, more in accordance with the actual history of phenomenology to see phenomenology as a philosophical movement that seeks to analyze *the relations between human beings and their world* rather than to be a *method* for describing reality.

Redefining phenomenology along these lines, Ihde developed a "nonfoundational" phenomenological approach which he calls "postphenomenological." Ihde maintains the central phenomenological idea that human-world relations need to be understood in terms of "intentionality," the directedness of human beings toward their world. He shows, however, that this intentionality relation is most often technologically mediated. Virtually all human perceptions and actions are mediated by technological devices, ranging from eyeglasses and television sets to cell phones and automobiles. These technological mediations do not so much take us to "the things themselves" that classical phenomenology was longing for, but rather help to construct what is real to us. Many mediated perceptions, after all, do not have a counterpart in everyday reality. Radiotelescopes, for instance, detect forms of radiation which are invisible to the human eye and which need to be "translated" by the device before astronomers can perceive and interpret it. There is no "original" perception here which is mediated by a device; the mediated perception itself is the "original." Phenomenological investigations of this type of mediation cannot possibly aim to return to "the things themselves," but rather aim to clarify the structure of technological mediation and its hermeneutic implications.

In my book *What Things Do* (2005), I expanded Ihde's definition of postphenomenology, by elaborating how human-world relationships should not be seen as relations between pre-existing subjects who perceive and act upon a world of objects, but rather as sites where both the objectivity of the world and the subjectivity of those who are experiencing it and existing in it are constituted (pp. 111–113). What the world "is" and what subjects "are," arises from the interplay between humans and reality; the world humans experience is "interpreted reality," and human existence is "situated subjectivity." Postphenomenology, then, consists in the philosophical analysis of human-world relations—including its technologically mediated character—and of the constitution of subjectivity and objectivity within these relations. It does not close the gap between subject and object by stressing that subject and object are always linked via the bridge of intentionality, but by claiming that they constitute each other. In the mutual relation between humans and reality, a specific "objectivity" of the world arises, as well as a specific "subjectivity" of human beings.

Phenomenology and Ethics

Postphenomenology's focus on the mediating role of technology in the constitution of subjectivity and objectivity makes it directly relevant to ethics. After all, the postphenomenological approach makes it possible to investigate how technologies help to shape human perceptions and interpretations of reality on the basis of which

moral decisions are made. A good example to illustrate this, as I will elaborate more extensively below, is obstetric 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 given 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 fetus and future parents, it constitutes both in specific ways, and therefore it plays a crucial role in moral decision-making.

This conclusion is at odds with the predominantly modernist understanding of the relations between subjects and objects, in which subjects are active and intentional, and objects passive and mute. Postphenomenology moves beyond this modernist framework by showing that human intentionalities can not only be operative "through" embodied technologies, but that in many cases "intentionality" needs to be located in human-technology associations—and therefore partly in artifacts as well—without being able to entirely reduce the resulting intentionality to what was explicitly delegated to them by their designers or users. Moreover, the postphenomenological approach shows that we cannot hold on to the autonomy of the human subject as a prerequisite for moral agency, but that we need to replace the "prime mover" status of the human subject with technologically mediated intentions. In our technological culture, humans and technologies do not have a separate existence anymore, but help to shape each other in myriad ways.

Accepting the existence of something like technologically mediated morality does not easily fit our conceptual frameworks. As Aaron Smith elaborated (2003), the lack of a human prime mover makes it difficult to attribute responsibility for the actions that occur. But rather than following his conclusion that "when we look to very complicated situations the human prime mover is concealed and difficult to find, but it is always there" (p. 193), I would like to contend that hanging on to the prime mover status of human beings fails to take the moral importance of technology seriously. As the ultrasound case will show, moral intentions come about on the basis of technological mediations of the relations between humans and reality, and are always properties of human-technology *associations* rather than of "prime movers." Adequate moral reflection about technology requires us to broaden the perspective of ethical theory and the ethics of technology.

A Postphenomenology of Ultrasound

By elaborating a concrete case, the ethical relevance of the postphenomenological perspective can become more clearly visible. The case I will elaborate here is obstetric ultrasound. I will analyze in what respects the roles played by this technology transcend the mere functionality of making visible an unborn child in the womb. Ultrasound might seem a rather innocent medical technology. Expecting couples generally like to have a sonogram made, because it is an exciting form of contact with the unborn child in the body of its mother. But even though it might be a "non-invasive" technology in a physical sense, ultrasound is far from non-invasive in a moral sense.

In the Dutch situation, pregnant couples are offered two routine ultrasound scans, one between the 10th and 12th week of pregnancy, and a second one at 20 weeks. The aim of the first scan is to determine the age of the fetus—and the term of pregnancy—but also to calculate the risk that the child will suffer from Down's syndrome. This risk is calculated on the basis of measuring nuchal translucency, which indicates the thickness of the nape in the neck of the fetus, most often in combination with a blood test. The aim of the second scan is to carefully examine the whole body of the unborn child in order to detect possible defects. This examination is done at 20 weeks, because at this time it can reveal more defects than the earlier scan, and because abortion in the Netherlands is legal—under specific conditions—until the 24th week. The examination can reveal a variety of defects, ranging from specific heart conditions to a harelip.

Postphenomenologically speaking, ultrasound constitutes the unborn in a very specific way: it helps to shape how the unborn can be perceptually present, and how it can be interpreted on the basis of the specific ways it is (re)presented. In Don Ihde's terms, a sonogram establishes a hermeneutic relation between the unborn and the people watching it. In hermeneutic relations, technologies produce a representation of reality, which needs to be interpreted by its "readers." Moreover, the technology itself embodies a "material interpretation" of reality, because it has to make a "translation" of what it "perceives" into a specific representation—in this case, the scanner has to make a relevant translation of reflected ultrasonic sound waves into a picture on a screen.

This implies that a sonogram does not provide a neutral "window to the womb"—as a well-known pro-life movie is called, which makes intensive use of ultrasound imaging (cf. Boucher 2004)—but actively mediates how the unborn is given in human experience. The specific mediation brought about by ultrasound imaging has a number of characteristics. Some of these are directly related to how the unborn is represented on the screen; others have to do with the specific organization of obtaining this visual contact with the unborn and the context against which the unborn can be made present. In all cases, the unborn is constituted in a specific way and so are its parents in their relation to it.

The Fetus as a Person

First of all, the image on the screen has a specific *size*, and even though the representation on the screen suggests a high degree of realism, the size of the fetus on the screen does not coincide with the size of the unborn in the womb. A fetus of 11 weeks old measures about 8,5 cm and weighs 30 grams, but its representation on the screen makes it appear to have the size of a newborn baby (cf. Boucher 2004, p. 12). Moreover, a number of techniques are available to construct a realistic image of the unborn. In addition to this, a sonogram depicts the unborn independently from the body of its mother. As Maragete Sandelowski (1994, p. 240) put it: "The fetal sonogram depicts the fetus as if it were floating free in space: as if it were already delivered from or outside its mother's body." Ultrasound isolates the unborn from its mother.

   All of these technological mediations generate a new ontological status of the fetus. Ultrasound imaging constitutes the fetus as an *individual person*; it is made present as a separate living being, rather than forming a unity with its mother, in whose body it is growing. As such, obstetric ultrasound contributes to the coming about of what has been called "fetal personhood": the unborn is increasingly approached as a person (Mitchell2001, p. 118; Boucher2004, p. 13), or even as a "baby" which still needs to be born (Sandelowski1994, p. 231; Zechmeister 2001, pp. 393–395). This experience of fetal personhood is enhanced by the possibility to see the gender of the unborn: by its ability to reveal the genitals, ultrasound genders the unborn. The expecting parents, as a result, can already call the unborn by its name. It is not surprising, then, that a print of the first sonogram is often included in the baby album as "baby's first picture"—as expressed in the title of Lisa Mitchell's book on obstetric ultrasound (2001).

The Fetus as a Patient

Ultrasound does not only constitute the fetus as a person, but also as a *patient*. An important goal of ultrasound screening is to detect abnormalities. In an early stage of pregnancy, ultrasound can be used for determining the risk of Down's syndrome; in a later stage it can be used to detect a variety of defects. For these purposes, ultrasound scanners are equipped with sophisticated software which helps obstetricians to quantify the body of the unborn in various ways. These measurements help to determine the term of pregnancy, but also the risk of specific diseases. Ultrasound imaging lets the unborn be present in terms of medical variables, and in terms of the risks to suffer from specific diseases (cf. Landsman 1998).

   In translating the unborn to a possible patient, ultrasound makes pregnancy into a medical process which needs to be monitored and which requires professional health care. Moreover, ultrasound translates "congenital defects" into preventable forms of suffering. As a result, pregnancy becomes a process of choice: the choice to have tests like neck fold measurements done at all, and the choice what to do if anything is "wrong." The detection of a defect with the help of ultrasound translates "expecting a child" into "choosing a child"—or choosing to terminate the pregnancy.

   In fact, the very possibility to have sonograms made at all, and therefore to detect congenital defects before birth, irreversibly changes the character of what used to be called "expecting a child." It inevitably becomes a matter of choice now: also the choice *not* to have an ultrasound scan made is a choice, even a very deliberate one in a society in which the norm is to have these scans made—from the predominant idea that *not* scanning for diseases is irresponsible, because then you deliberately run the risk to have a disabled or sick child, causing suffering both for the child and for the expecting parents and their families.

Relations Between Unborn and Parents

This isolation of the unborn from its mother creates a new relation between both. On the one hand, the mother is now deprived from her special relation to the unborn,

shifting the privilege of having knowledge about the unborn to health care professionals (Sandelowski 1994, pp. 231, 239). But on the other hand, these detaching effects have their counterpart in an increased bonding between mother, father, and unborn. Ultrasound can give expecting parents assurance of the baby's health and the feeling of being closer and more attached to the unborn (Zechmeister 2001, p. 389). This visual nearness to the unborn is also used in pro-life campaigns using ultrasound images to support their claim that abortion comes down to murdering a vulnerable person (Boucher 2004; Petchesky 1987).

Another effect of this separation of mother and unborn is that the mother is increasingly seen as the *environment* in which the unborn is living, rather than forming a unity with it. And while the fetus is constituted as a vulnerable subject, its environment is potentially harmful. This opens the way for using ultrasound screening as a form of surveillance, monitoring the lifestyle and habits of expecting women in order to enhance the safety of the unborn. Rather than an intimate place to grow, the womb now becomes a potentially hostile environment which needs to be guarded (Oaks 2000; Stormer 2000). The role of fathers in pregnancy is often enhanced by ultrasound, though. Fathers appear to feel more involved because of the new visual contact with their unborn. And because of the medical status of having a sonogram made, fathers are more easily allowed to take a few hours off to attend the examination—while accompanying their partners to the regular midwife visits is usually a bigger problem for employers (Sandelowski 1994).

The most important mediating role of ultrasound imaging, however, is that it constitutes expecting parents 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 by visualizing "fetal personhood." But nevertheless, ultrasound places expecting parents in the position to make a decision about the lives of their unborn child. By constituting both the unborn, the father, and the mother in very specific ways, it helps to organize a new relation between the three. What appears to be an innocent look into the womb, can end up being a first step in a decision-making process for which many expecting couples did not explicitly choose.

The impact of ultrasound imaging on moral decision-making regarding abortion is not just an interesting theoretical hypothesis—the use of obstetric ultrasound has important effects on the practice of antenatal diagnostics and abortion. Nuchal fold measurement, for instance—also in its usual combination with a blood test—does not provide certainty about the health condition of the unborn, but only gives an indication of the risk that the unborn will suffer from Down's syndrome. In order to get certainty, an amniocentesis needs to be done, which is an invasive examination giving a risk of about 1:250 to have a miscarriage. Implicitly, for many parents, the desire to exclude the risk of having a child with Down's syndrome appears to be more important than the risk to lose a healthy unborn child. Moreover, the 20–weeks ultrasound examination offered in the Netherlands to all pregnant women appears to increase the number of abortions of fetuses with less severe defects like a harelip (Trouw 2006).

It appears to be hard to escape the technological constitution as subjects that have to make a decision about the life of their unborn child. Even when people deliberately choose to use the 11-weeks ultrasound examination only to determine the expected date of birth, the mere possibility that the radiologist might see the thickness of the nuchal fold will make it difficult not to try and interpret the expression of the face of the practitioner. Ultrasound inevitably and radically changes the experience of being pregnant and the interpretations of unborn life.

Ethical Implications

This postphenomenological analysis of the constitutive role of ultrasound imaging in the relations between parents and unborn child has important implications for ethical theory. Not only does it give occasion to raise the question whether some form of moral agency needs to be ascribed to devices like ultrasound scanners, since they appear to actively help answer our moral questions (cf. Verbeek 2006a, b). It also draws attention to an interesting connection between postphenomenology and ethics: the constitution of the moral subject. Here, postphenomenology touches the work of Michel Foucault. Foucault's ethical work, as laid down in parts two and three of his *History of Sexuality*, published just before his death, focuses on understanding the moral subject and its role in ethics (1984a, b). Foucault did not take the moral subject as given, but as precisely what is at stake in ethics. Ethics is done by "subjecting" oneself to a specific ethical code, and by doing so people constitute themselves as specific moral subjects. For Foucault, ethics consists in making this subject constitution explicit and asking ourselves the question what moral subjects we want to be. Postphenomenology adds a new dimension to this constitution of the moral subject: its technologically mediated character. In what follows, I will explore this intersection between postphenomenology and Foucault's work, in order to elaborate an ethical perspective of technology which addresses the technological mediation of the constitution of moral subjectivity.

Technology and Moral Subjectivity[1]

The main conclusion that can be drawn from the analysis above is that ethics is not a solely human affair, but a matter of associations between humans and technologies. This implies that the ethics of technology cannot depart from a separation between humans and technology, which characterizes so many ethical approaches. This separation, for instance, hides behind precautionary approaches which aim to pull the emergency brake when a specific technological development would be a threat to society. And it hides behind approaches that aim to find the most prudent and just way to deal with the risks that are connected to the introduction of a new technology. In these approaches, humans are placed on the one side of a line,

---

[1] Parts of this section are based on fragments from a section of my article "Ethiek en technologie: moreel actorschap en subjectiviteit in een technologische cultuur" (2006b).

technologies on the other side, and humans have the task to see to it that technologies do not cross the line too far and start to interfere in the human world in undesirable ways. This scheme is at the roots of many moral frameworks which are still influential, like Habermas' lifeworld-system model (Habermas 1984) and Heidegger's plea for an attitude of "releasement" in dealing with technology (Heidegger 1969), aiming to use technology only when it is unavoidable, without letting ourselves be determined by it.

Positions like these perfectly see that very close relations can exist between humans and technologies—contrary to the at least equally influential position of *instrumentalism* which (wrongly) holds that technology is primarily an instrument which can be used for good and bad purposes and in good or bad ways, without being good or bad in itself. Yet, the technophobia which is implicit in it, to use a concept of Gilbert Hottois (Hottois 1996) has counterproductive effects. Rather than taking the interwoven character of the human and the technological as a point of departure for ethical reflection, the technological is taken as a threat, which needs to be kept away from the human with the help of ethics.

Simple examples can make visible the failure of this reasoning. Gerard de Vries, for example, showed how the moral evaluation of anesthesia has changed drastically over time (De Vries 1993). While the application of anesthesia was initially condemned severely, on various moral and theological grounds, nowadays it would be highly immoral to perform surgery *without* anesthesia. Seen from the past, the critics of those times would probably interpret this development as the results of entering a slippery slope, but from the perspective of the present it becomes clear that ethics is a dynamic phenomenon, which develops in interaction with technology.

Ethics and Moral Self-Constitution

The late work of Michel Foucault opens a perspective on ethics which offers room to do justice to this relation between ethics and technological developments, and to the technologically mediated character of moral action. In the last two volumes of his *History of Sexuality*, he elaborates an approach to ethics which differs radically from the prevailing ethical frameworks (Foucault 1984a; b). For Foucault, ethics is not primarily about the question which imperatives we need to follow, but about the ways in which human beings constitute themselves as "subjects" of a moral code. And rather than aiming to develop a new code himself, Foucault investigates what these codes "do" to people and how humans "subject" themselves to it.

In order to achieve this, Foucault connects to ethical approaches from classical antiquity, in which ethics was explicitly directed at "developing a self"; at constituting oneself as a specific subject. The word "subject" perfectly brings to expression that ethics is not only a matter of a person who is the "subject" of his or her life, like the "subject" of a sentence, but that this person also "subjects" him- or herself to a specific moral code—a specific vision of what constitutes a good life and a good person. In this very "subjection," Foucault locates ethics. Moral "subjection" has already taken many forms, like the Kantian subject that wants to keep its intentions pure and assesses them in terms of their potential to function as

universal laws; or the utilitarian subject that aims to examine the consequences of its actions in order to attain a prevalence of positive outcomes over negative outcomes. The most important characteristic of classical ethical frameworks, however, is that they show that in ethics not only the moral rightness of our actions is at stake, but also our moral *subjectivity*. Rather than taking place implicitly, as Foucault shows, in classical Antiquity the constitution of subjectivity was an explicit affair.

Foucault's investigation of classical ethics primarily concerns the ethics of sexuality. He convincingly shows that in classical Antiquity, sexuality was not organized via a moral code of imperatives and prohibitions, but primarily in terms of *styling*. Ethics consisted in finding such a relationship to one's sexual passions and drives that they do not *determine* the self but become the object of active styling in the form of "self practices." Rather than letting the subject take shape *implicitly*, e.g., by subordinating its passions to Christian sexual morality, or by subordinating its intentions to a Kantian categorical imperative, in classical Antiquity subject constitution took place *explicitly*, in a variety of ascetic and aesthetic practices. The purpose of these practices was not to subordinate the passions to a code, but to stylize one's sexual behavior. Or, put more broadly: ethics was not about showing the morally right behavior, but about living a good life. Foucault indicated these practices of moral self-constitution as "techniques of the self" or "practices of the self": the explicit styling, practicing and shaping of oneself into a specific moral individual.

This does not imply that Foucault wanted to return to the specific subject of classical antiquity. But he did want to return to *the way in which* that subject came into being: the explicit shaping of one's subjectivity by deliberately "subjecting" oneself to a specific code and specific moral practices. In fact, Foucault's approach implies that *any* form of ethics is based on a specific form of "subjection"—even modern ethical systems like Kantian deontology and utilitarian consequentialism. Any ethical system, after all, not only defines a code of behavior but also a subject that is supposed to follow this code. Also, following the Kantian categorical imperative or acting such that desirable consequences prevail over undesirable consequences are ways to constitute oneself as a moral subject.

Ethics of Technology and the Moral Subject

This approach to ethics in terms of moral self-constitution has particular relevance for the ethics of technology. Foucault's ethical perspective unites two aspects that usually remain opposites in ethics: the radically mediated character of the subject on the one hand, which causes the subject to lose the autonomy it used to have ever since the Enlightenment; and the ability of the subject to relate itself to what mediates the subject on the other hand, which enables the subject to actively help to shape these mediations. Just like the ancient Greek and Romans did not deny or suppress the sexual passions, but rather acknowledged and actively helped to shape them, we can develop a relation to what appears to determine us by actively shaping these "determinants." And in our times, technology is a pre-eminent example of these determinants—without, to be sure, aiming to downplay the important role of sexuality in our culture.

If technology fundamentally mediates what kind of humans we are, by shaping our actions and experiences, and even our moral decisions, this does not yet imply that "humanity" is mastered by "technology" or that "the system" has entered "the lifeworld" and causes humans not to be treated as subjects but as objects, as some Heideggerian and Habermasian positions want us to believe. From a Foucauldian perspective, the technologically mediated character of life in a technological culture does not need to be seen as a *threat* to the subject but rather forms a specific way in which the subject is *constituted*. This technologically mediated constitution of the subject, then, is not merely a state of affairs we simply have to accept; it rather is the starting point for moral self-practices (cf. Dorrestijn 2004, pp. 89–104).

By acknowledging the inevitability of the mediated character of human subjectivity, and the fact that technology is one of the sources of mediation, it becomes possible to connect ethics with the phenomenon of technological mediation. Ethics then does not merely come down to protecting "humanity" against "technology," but consists in carefully assessing and experimenting with technological mediations, in order to explicitly shape the way in which we are subjects in our technological culture.

Connecting again to the example of ultrasound can clarify what such experiments can entail. As we saw, ultrasound substantially contributes to the experience of expecting a child, by framing pregnancy in medical terms, and confronting expecting parents with a dilemma if their unborn appears to have a significant risk of a serious disease. From a moral point of view, this role of ultrasound imaging is at least as important as, e.g., the possible health risk for the fetus caused by ultrasonic sound waves, which would be the natural focus of many ethical approaches to technology. This is especially true when taking into account that such dilemmas have a tragic dimension. As explained above, the risk-estimation offered by ultrasound can only be converted into certainty by having an amniocentesis done, which has a risk of provoking a miscarriage—and in many cases this risk is higher than the risk to have a child suffering from Down's syndrome. Having antenatal ultrasound examinations done, therefore, inevitably implies the choice for a specific kind of subjectivity, in which humans are constituted as subjects that have to make decisions about the life of their unborn child, and in which obtaining certainty about the health condition of an unborn child is worth the price of losing a healthy unborn child as a result of the required test.

When this specific form of subject constitution becomes the subject of moral reflection, we gain the space to explicitly relate ourselves to it. By deliberately dealing with ultrasound imaging, after all, this subject constitution can be modified, changed, and refined, e.g., by only using ultrasound to determine the expected date of birth, without wanting to have further information about nuchal translucency or neural tube defects; or by only using antenatal examinations to estimate a risk, in order to be prepared for the possible birth of a child with health problems, without exposing oneself to the risks of having an amniocentesis done; or by actually having all tests done, as an explicit choice rather than an unintended side-effect of the normative workings that are hidden behind offering such diagnostic tests at a large scale; or by refusing ultrasound examinations altogether (cf. Rapp 1998).

This explicit relation to the mediating role of technology embodies a form of *freedom* that is an interesting alternative to *autonomy*. Recognizing that our experiences and actions are inevitably mediated by technology, the choice is here to explicitly "shape" and "stylize" these mediations, in order to help to shape one's own subjectivity. Freedom here is not the *absence* of factors that steer and shape the subject, but the very *relation* to these factors. Our existence, after all, takes place in an environment that shows resistance; without this resistance we simply could not exist. Freedom is a *practice* that is co-organized by the technological infrastructure of our existence, and which forms the basis for the shape our subjectivity takes. The subject, in Foucault's words, is a *form* that always needs to take shape in concrete "self practices" (O'Leary 2002, pp. 2–3).

Technologically Mediated Subject Constitution

Foucault does not directly relate his analysis of subject constitution to technology. Yet, in view of his ethics of moral subjectivity, the technologically mediated constitution of the moral subject deserves a central place in the ethics of technology. In this section, I will further elaborate how Foucault's ethical work and the postphenomenological analysis of technological mediation can be integrated to accomplish this.

Foucault discerns four aspects of moral self-constitution: the *ethical substance* which is the object of ethical work; the *mode of subjection* that is applied; the *self practices* in which the ethical substance gets shape; and the *teleology* of these practices, which consists in the way of existing we aspire to by acting in a moral way. Connecting these four aspects of moral self-constitution to the ways in which technologies help to shape the subject makes it possible to open an ethical perspective on technology in which the interwoven character of humans and technology is the starting point of ethical reflection.

The *ethical substance* concerns what people in a specific historical period take as the "material" of ethical self-work; the point of application for subjectivation. This can be the *intentions* behind our actions, as elaborated in the work of Kant, but also the *passions*, which have been, for instance, the object of Christian morality and of classical Greek ethics (Foucault 1997, p. 263). In the ethical perspective opened by Foucault himself, the material for ethics is the "subject form" in a more general sense: the subject taken purely as a form that receives content by being "subject-ed" in a specific way. For a Foucauldian perspective on technology, this subject form is the ethical substance: the subjectivity that is getting shape in interaction with both technology and with our own ways of dealing with these technological mediations. The human subject is constituted in a complex interplay of mediating technology, the reality to which it relates itself, and the way in which it relates itself to its own subjectivity and to the ways in which it is technologically mediated.

For Foucault, the *mode of subjection* is the way in which people are invited or stimulated to recognize a specific code as morally obliging. This can be a divine law which is revealed in a book, a cosmic order of natural laws, or a universal and rational rule (Foucault 1997, p. 264). In our technological culture, this mode of

subjection in many cases exists in the phenomenon of technological mediation itself. The ways in which technologies help to shape our actions and the interpretations on the basis of which we make decisions, after all, determine to a high degree what can be recognized as a moral obligation, what moral problems are morally relevant, and what persons have specific moral responsibilities. Technologies shape us as specific moral subjects—like ultrasound constitutes expecting parents as subjects that have to make a decision regarding the life of their unborn, and makes it possible to prevent the birth of children with serious diseases. Not only the religious frameworks, views of life, and philosophical systems that were handed down to us impose moral tasks and obligations upon us, but so do technological artifacts.

Subsequently, *self practices* in a technological culture consist in deliberately dealing with this phenomenon of technological mediation, in order to help shape the ways in which technologies are used and impact our daily lives. Foucault indicates the "self-forming activities" of self practices as "ascetism": a form of ascesis, defined broadly, in which human beings take a distance from what determines them. This ascesis does not necessarily exist in radically *abandoning* things, like comfort, sex, or specific kinds of food, to mention some ascetic examples from the past. What is crucial here for Foucault, is the *distance* the subject takes from his or her situation in order to *relate* to it. This distance implies that the subject is not simply handed over to the powers that aim to shape it, but explicitly *takes a stance* toward these powers—not denying their important role in subject constitution, but actively accompanying and reshaping this role.

In our culture, technology is one of the most important powers that help shape subjectivity. Ascesis in a technological culture, therefore, primarily means: deliberately using technology by anticipating and modifying its mediating role in our existence, realizing that each use practice helps to shape one's subjectivity. It does *not* imply, therefore, that one should refrain from technology, and only use it reluctantly when it is unavoidable, as embodied in Heidegger's attitude of "releasement" (*Gelassenheit*). Technological ascesis, to the contrary, consists in *using* technology, but in a deliberate and responsible way, such that the "self" that results from it—including its relations to other people—acquires a desirable shape. Not the moral acceptability, then, is central in ethical reflection on technology use, but the quality of the *practices* that result from it, and the *subjects* that are constituted in it.

Teleology for Foucault, to conclude, is about the question of what kind of beings we aspire to be when we behave morally. What do we aim at when we literally "subject" ourselves to a specific moral code—what kind of subjects do we want to be? In Foucault's words, regarding the ethical systems from the past: "Do we want to become pure, or immortal, or free, or masters over ourselves?" (Foucault 1997, p. 265). Given the technologically mediated character of subjectivity, answering the question of what kind of subjects we want to be is one of the major challenges of our technological culture. Integrating Foucault's analysis of moral subject constitution and the postphenomenological analysis of technological mediation, a teleological perspective in our technological culture should address the question of how to shape our selves in dealing with technology: what kind of mediated subjects do we want to

be? Rather than separating the human domain from the domain of technology, we need to ask ourselves in what ways we want both domains to interfere with each other. Their interwoven character is unavoidable—and therefore ethics should not try to save humanity from technology, but to let both domains interact in desirable ways.

For answering the question of what kind of mediated subjects we want to be, to be sure, the ethical frameworks from classical virtue ethics and modern deontological and utilitarian systems can continue to play an important role. Foucault's thesis that all ethical systems eventually embody a specific form of subject constitution, after all, does not take away the fact that the frameworks that were handed down to us from the past can still prove to be valuable for dealing with the technological mediation of our subjectivity and with the question of what kind of subjects we want to be. Moral self-practices in a technological culture, in which human beings attempt to give a desirable shape to the technological mediation of their subjectivity, offer plenty of space for the virtue ethics pursuit of the good life, the deontological ambition to meet moral norms, and the utilitarian goal to reach a preponderance of positive effects over negative effects.

Regarding the case of obstetric ultrasound, parents can for instance choose to have their unborn child screened for diseases because the birth of a child with a serious disease can have very negative effects on the other children in the family. They can also refuse ultrasound screening, for instance on the basis of the norm that unborn life may not be terminated, or from the desire not to be brought in a position of having to make a decision about the life of one's unborn child. In all of these cases, there is a deliberate shaping of the ways in which humans are being constituted as moral subjects, from the realization that technology plays a mediating role here too. Human beings are not fully autonomous in their subject constitution; they have to accept both the pregnancy and the possibility to have ultrasound screening done as a given fact. But they do have the freedom to let themselves be constituted as a specific subject—a subject that will have to decide about the life of its unborn child; a subject that orients itself on norms which exist separately from the situation in which they need to be applied; or a subject that wants to use the availability of a technological form of contact with unborn life for a careful assessment of all possible consequences of letting or letting a child be born with a serious disease.

Conclusion

In our technological culture, it is of vital importance not to consider technology and morality as two separate phenomena located in two separate domains. Technologies play a fundamentally mediating role in human practices and experiences, and for this reason it can be argued that moral agency is distributed over both humans and technological artifacts. This technologically mediated character of moral agency deserves a central place in the ethics of technology. Rather than focusing mainly on the early detection and just distribution of risks, the ethics of technology should also address the phenomenon of technological mediation.

One of the most important ways to do this, besides analyzing the moral role of artifacts, is to address the role technology plays in the ways human beings are constituted as moral subjects. This can be done by connecting the postphenomenological approach of technological mediation to Foucault's ethical perspective. Such a connection enables the ethics of technology to address the quality of the technological mediations of moral decisions. This can be done by enabling designers to actively anticipate the morally relevant role of technology. But it can also be done by developing a specific attitude to technology in which the technological constitution of moral subjectivity is explicitly reflected upon and actively reshaped. Only by explicitly addressing how technologies help to constitute humans as moral subjects, can the ethics of technology do justice to both the moral character of technology and the technological character of morality.

References

Boucher, J. (2004). Ultrasound: A window to the womb? Obstetric ultrasound and the abortion rights debate. *Journal of Medical Humanities*, *25*, 7–19.

De Vries, G. (1993). *Gerede twijfel: over de rol van de medische ethiek in Nederland*. Amsterdam: De Balie.

Dorrestijn, S. (2004). Bestaanskunst in de technologische cultuur: over de ethiek van door techniek beïnvloed gedrag. Master's thesis. University of Twente, The Netherlands.

Foucault, M. (1984a). *L'usage des plaisirs*. Paris: Gallimard.

Foucault, M. (1984b). *Le souci de soi*. Paris: Gallimard.

Foucault, M. (1997). *Ethics: Subjectivity and truth* In P. Rabinow (Ed.), New York: New Press.

Habermas, J. (1984). *The theory of communicative action*. Boston: Beacon Press.

Heidegger, M. (1969). *Discourse on thinking* (trans: Anderson, J.M. & Freund, E.H.). New York: Harper & Row.

Hottois, G. (1996). *Symbool en techniek*. Kampen/Kapellen: Kok Agora/Pelckmans.

Ihde, D. (1990). *Technology and the lifeworld*. Bloomington: Indiana University Press.

Ihde, D. (1998). *Expanding hermeneutics*. Evanston: Northwestern University Press.

Landsman, G. H. (1998). Reconstructing motherhood in the age of "perfect" babies: Mothers of infants and toddlers with disabilities. *Signs*, *24*, 69–99.

Merleau-Ponty, M. (1962). *Phenomenology of perception* (trans: Smith, C.). London: Routledge.

Mitchell, L. (2001). *Baby's first picture: Ultrasound and the politics of fetal subjects*. Toronto, ON: University of Toronto Press.

O'Leary, T. (2002). *Foucault. The art of ethics*. London/New York: Continuum.

Oaks, L. (2000). Smoke-filled wombs and fragile fetuses: The social politics of fetal representation. *Signs*, *26*, 63–108.

Petchesky, R. P. (1987). Fetal images: The power of visual culture in the politics of reproduction. *Feminist Studies, 13*, 263–292.

Rapp, R. (1998). Refusing prenatal diagnosis: The meanings of bioscience in a multicultural world. *Science, Technology, and Human Values, 23*, 45–70.

Sandelowski, M. (1994). Separate, but less unequal: Fetal ultrasonography and the transformation of expectant mother/fatherhood. *Gender and Society, 8*, 230–245.

Smith, A. (2003). Do you believe in ethics? Latour and Ihde in the trenches of the Science Wars (Or: Watch out, Latour, Ihde's got a gun). In D. Ihde & E. Selinger (Eds.), *Chasing technoscience: Matrix for materiality*. (pp. 182–194). Bloomington: Indiana University Press.

Stormer, N. (2000). Prenatal space. *Signs*, *26*, 109–144.

Trouw (2006, 11 December). Abortus om hazenlip komt voor-onderzoeken of echo's leiden tot meer zwangerschapsafbrekingen. (newspaper article).

Verbeek, P. P. (2005). *What things do: Philosophical reflections on technology, agency, and design*. University Park: Penn State University Press.

Verbeek, P. P. (2006a). The morality of things—A postphenomenological inquiry. In E. Selinger (Ed.), *Postphenomenology: A critical companion to Ihde*. (pp. 117–130). New Albany: SUNY Press.

Verbeek, P. P. (2006b). Ethiek en technologie: moreel actorschap en subjectiviteit in een technologische cultuur. *Ethische Perspectieven, 16*, 267–289.

Zechmeister, I. (2001). Foetal images: The power of visual technology in antenatal care and the implications for women's reproductive freedom. *Health Care Analysis, 9*, 387–400.