Human development or human enhancement? A methodological reflection on capabilities and the evaluation of information technologies

Mark Coeckelbergh

Abstract Nussbaum's version of the capability approach is not only a helpful approach to development problems but can also be employed as a general ethical-anthropological framework in 'advanced' societies. This paper explores its normative force for evaluating information technologies, with a particular focus on the issue of human enhancement. It suggests that the capability approach can be a useful way of to specify a workable and adequate level of analysis in human enhancement discussions, but argues that any interpretation of what these capabilities mean is itself dependent on (interpretations of) the techno-human practices under discussion. This challenges the capability approach's means-end dualism concerning the relation between on the one hand technology and on the other hand humans and capabilities. It is argued that instead of facing a choice between development and enhancement, we better reflect on how we want to shape human-technological practices, for instance by using the language of capabilities. For this purpose, we have to engage in a cumbersome hermeneutics that interprets dynamic relations between unstable capabilities, technologies, practices, and values. This requires us to modify the capability approach by highlighting and interpreting its interpretative dimension.

Keywords Capabilities · Information technology · Human enhancement · Ethics · Human-technology relations · Hermeneutics

M. Coeckelbergh (✉)
Department of Philosophy, University of Twente, P.O. Box 217,
7500 AE Enschede, The Netherlands
e-mail: m.coeckelbergh@utwente.nl

Introduction

Information technologies such as social network sites, computer games, and tele-monitoring in health care create new spaces of action and experience but also raise many ethical questions. For instance, do social network sites threaten our privacy? Do they promote friendship? Are computer games anti-social? Is tele-monitoring of people in their homes a violation of people's autonomy or does it empower them? Information technologies like the Internet and mobile phones change our lives and it is not obvious that these changes are always for the better. Moreover, the ethical concerns only grow once we consider the possibility of using information technology for improving or 'enhancing' humans: so-called human enhancement. For instance, should we 'enlarge' or 'extend' our cognitive capacities by (directly) connecting our brains to a computer? Is this a vision of the future or are we *already* 'extending our mind' when we use electronic devices such as PCs and mobile phones? How can philosophical ethics engage with these concerns?

One way of analysing and evaluating what information technologies do and might do to humans and society is using the *capability approach* as a normative-ethical framework. The approach helps us to phrase the ethical question as being concerned with how information technologies impact on human capabilities, in particular the 'central' human capabilities (see below), and how they might even remove capabilities or add new capabilities (both central and specific). Rather than asking how information technology changes or 'extends' our 'minds' or 'bodies', then, this functional approach allows us to highlight how information technologies shape what people are (or will) actually be *able to do*. What matters for ethics is not so much what the technology does to our *brains*, *minds*, or *bodies* but rather what it enables us to do, how it impacts

on our actual and potential functionings or *capabilities* we have as humans and as the particular persons we are living in a particular societal, cultural, and technological context.

I will summarize the main claims of the capability approach below. But since to employ the capability approach for *ethical* purposes and in relation to information technologies may strike some readers as unusual, let me first provide some justifications for this broad and general use of the approach.

The capability approach as a broad and general normative framework

The capability approach has attracted considerable interest from researchers in many academic fields, ranging from development studies and welfare economics to education and philosophy. This is unsurprising. While in practice capability theorists are often concerned with people in 'development' issues (e.g. poverty), the scope and potential significance of the approach is far broader in several senses.

First, the capability approach is equally applicable to economically and technologically 'advanced' societies. 'Development' has always been broadly defined by Sen and others, for example as 'a process of expanding the real freedoms that people enjoy' (Sen 1999, p. 3). Thus, there is nothing intrinsic to the capability approach that gives us a reason to restrict the scope of the approach to people in development countries. Moreover, there is a universalist and emancipatory dimension to the capability approach. The focus is on capabilities we have *as* humans, that is, all humans. As Martha Nussbaum puts it using a quasi-Kantian idiom:

> The capability approach is fully universal: the capabilities in question are held to be important for each and every citizen, in each and every nation, and each person is to be treated as an end. (Nussbaum 2006, p. 78)

Nussbaum believes that her list of capabilities 'can gather broad cross-cultural agreement' similar to human rights (Nussbaum 2006, p. 78). This universalism implies, among other things, that the applicability of the capability approach extends to discussions about the use of, for instance, information technology in 'advanced' and 'developed' countries (see below).

Second, as a normative framework the approach can and has been used for several purposes. As Robeyns writes in her survey, it can be used for the evaluation of 'individual well-being and social arrangements, the design of policies, and proposals about social change in society' (Robeyns 2005, p. 94). As such, it can inform both philosophical reflection and empirical research.

Third, within the domain of normative theory, the approach has a more general potential than its main

theorists and interpreters tend to allow. For example, Nussbaum says that her conception of human functioning and capability is a 'partial' conception of the good life and a 'moral conception selected *for political purposes only*' (Nussbaum 2000, p. 77; my emphasis). Moreover, it even seems that—firmly remaining within the spirit of philosophical liberalism—Nussbaum wants to avoid making (substantive) claims about the good life at all. However, these reservations and self-imposed limitations underestimate the capability approach's normative potential. With the work of Nussbaum and others the capability approach has assumed the character of a more general, attractive normative framework that concerns itself with core issues in liberal and neo-Aristotelian political *and* moral theory such as individual *well*-being, *justice* (e.g. social justice and global justice), human *dignity*, and human *excellence* (the good life, human flourishing). As I will show below, the step to ethics, in particular good life ethics, has already been taken by Nussbaum. Moreover, since Sen and Nussbaum are keen to keep their formulations of capabilities at a general, vague level in order to keep their theory wide open to conceptual adjustment and applicable to many different societies and circumstances (see below), one may well wonder how 'partial' the scope of their conception and their theoretical ambitions really are.

Finally, as I will show below the approach could be interpreted as having connections to other sub-domains of philosophy such as philosophical anthropology and metaphysics since the central capabilities can be interpreted as an expression of what it is to be human and since the approach raises the question if that is a matter of conceiving of a 'freestanding' moral notion (see below) or if it is dependent on culture and context.

But whether or not my suggestions about what the capability approach *should* do in terms of scope is acceptable to those who think of themselves as capability theorists, it should be clear by now that the capability approach is a broad conceptual framework, ranging over many disciplines, domains, and issues, and indeed allowing and fostering different interpretations. In addition, I shall assume in the following discussion that it has normative force and potential in both politics *and* ethics.

Aims of this paper

This paper aims to discuss the capability approach, in particular Nussbaum's version of it, by exploring the precise nature of the relation between capabilities and information technologies. It will do so by discussing this question in the light of emerging possibilities for human *enhancement*. This will bring out a significant benefit of the capability approach: it allows us to define a helpful level of analysis (capabilities) and—eventually—to redefine the

issue of human enhancement in a novel way. However, this discussion will also challenge an important philosophical assumption made by (my interpretation of) the capability approach related to its view of the relation between capabilities and technology. It will suggest that the end/means scheme as applied to the relation between capabilities and technology must be abandoned and replaced by a hermeneutics of techno-human change, involving interpretations of dynamic relations between unstable capabilities, technologies, practices, and values. This requires us to use the capability approach in a way that highlights its interpretative dimension.

First I will provide a brief outline the capability approach and its recent theoretical developments in order to set it up as an ethical-normative framework. Then I will introduce the problem of the relation between capabilities and technology and discuss this problem in the light of the issue of human enhancement. I end with further remarks on how the (philosophical version of the) capability approach can be enriched in terms of method. Throughout the paper I will use the example of social networking sites and the capability of affiliation—not only in order to render my reflections relevant to issues in ethics of information technology, but also to give more substance to my core argument about capabilities and techno-human change.

The capability approach: from human development to human dignity and human excellence

The capability approach emerged in response to previous approaches to development studies or welfare economics, which focused on overall economic measures, utility, and material resources, but neglected the issue of (fair) distribution and the abilities of people to transform resources into valuable activities. For Amartya Sen, usually regarded as the founder of the capability approach, a focus on capabilities or 'real freedoms that people enjoy' was to replace 'narrower views of development, such as identifying development with the growth of gross national product, or with the rise in personal incomes' (Sen 1999, p. 3). Sen wanted to put the emphasis on the objectives (capabilities, freedoms), not on the means to reach those objectives (resources, social and economic arrangements, technological progress, etc.).

This view has not only been highly successful in economics and policy (consider the UN's Human Development Index, inspired by Sen's approach); it has also inspired philosophical work. In particular, partly in collaboration with Sen (Nussbaum and Sen 1993; Nussbaum 2000, 2006), Martha Nussbaum has articulated a version of the capability approach that defines well-being in terms of capabilities. In *Frontiers of Justice* (2006) this philosophical

development of the approach has taken the form of a more systematic argument that engages with Rawls's contractarian thinking and with various historical-philosophical sources. Nussbaum argues that her list of capabilities is founded on the principle of human dignity, an idea which has roots in Marx, Grotius, and Aristotle.

> The basic intuitive idea of my version of the capabilities approach is that we begin with a conception of the dignity of the human being, and of a life that is worthy of that dignity (…). (Nussbaum 2006, p. 74)

Nussbaum's conception of dignity is based on Nussbaum's reading of Marx in the sense that human beings are seen as standing in need of many (opportunities for) activities (p. 74). It is inspired by Grotius' natural law theory in the sense that Nussbaum agrees with Grotius that humans have a natural sociability and that political theory should be based on dignity and sociability (p. 36). It is neo-Aristotelian in the sense that for her human beings are political *animals*, that is, they are rational but they are also bodily, vulnerable, needy beings and in Nussbaum's interpretation this animality is not opposed to rationality; instead, they are 'thoroughly unified' (p. 159).

This concept of dignity is then used as a basis for the capabilities. According to Nussbaum, dignity requires 'an appropriate threshold level' (p. 75) of the following 'central' human capabilities (my summary):

1. *life*: 'Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living'
2. *bodily* health (includes nourishment and shelter)
3. *bodily* integrity: free movement, freedom from sexual assault and violence, having opportunities for sexual satisfaction
4. being able to use your *senses, imagination, and thought*; experiencing and producing culture, *freedom* of expression and freedom of religion
5. *emotions*: being able to have attachments to things and people
6. *practical reason*: being able to engage in a conception of the good and critical reflection about the planning of one's life
7. *affiliation*: being able to live with and toward others, imagine the other, and respect the other
8. *other species*: being able to live with concern to animals, plants and nature
9. *play*: being able to laugh, to play, to enjoy recreational activities
10. *control over one's environment*: political choice and participation, being able to hold property, being able to work as a human being in mutual recognition

(Nussbaum 2006, pp. 76–78; my summary)

This philosophical articulation of the capability approach has strong normative appeal. It is not only a useful approach to welfare problems in development countries or to problems of national and global justice (Nussbaum 2006; Coeckelbergh 2007). As I argued above, it can be applied in 'advanced' societies as well as development countries and its thematic reach goes beyond issues of justice. Moreover, I have suggested that it can be used as a general *ethical* framework.
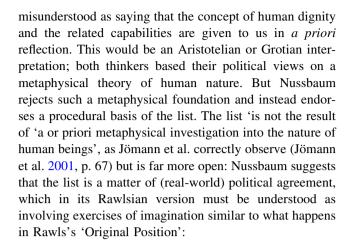
As an ethical framework, it can support a *sufficitarian* argument but there are also other options. In line with Nussbaum's neo-Aristotelian thinking, the capabilities can be understood not only as *minimal* requirements or 'thresholds' for dignity or justice, as Nussbaum usually sees them, but rather as formulations of the ethical 'maximum': they can be interpreted as what the good life or human *flourishment* requires.[1] Nussbaum admits that after having identified the threshold, 'we seek a higher threshold, the level above which not just mere human life, but *good life*, becomes possible' (Nussbaum 2006, p. 181). In this interpretation, Nussbaum's list amounts to an 'objective-list' approach to what delineates a space of possibility for living good, flourishing lives. This does not mean that—with Nussbaum—we have to say that there is only *one* good life. Given the condition of pluralism in our societies, it seems wise to move beyond Aristotle on this point and this interpretation is supported by Nussbaum. She remarks that in contrast to Aristotle she holds that there is not one single idea of human flourishing but rather 'a space for diverse possibilities for flourishing' (Nussbaum 2006, p. 182). Understood as a neo-Aristotelian articulation of human excellence, then, the capability approach lists elements that constitute what it is to be fully human. As such, Nussbaum's capability approach makes a substantive claim about what it is to be human (anthropological claim) and what constitutes good lives (ethical claim). In the latter role, the list can be used as an instrument to guide and evaluate human-technological practices in the way proposed in the introduction.

In so far as the approach makes explicit what we value and what we are, it can offer ethical guidance in many domains. For instance, elsewhere I have proposed to apply the approach to health care (Coeckelbergh 2010). Here I will use the example of social network sites (see the next section).

Before moving to the evaluation of (information) technologies, however, I would like to add an important qualification to my claim that the capabilities list is based on human dignity and on what we are as humans. If presented in this way, Nussbaum's argument could be easily

---

[1] I leave open if this is also what Marx's notion of 'truly human functioning' requires.

misunderstood as saying that the concept of human dignity and the related capabilities are given to us in *a priori* reflection. This would be an Aristotelian or Grotian interpretation; both thinkers based their political views on a metaphysical theory of human nature. But Nussbaum rejects such a metaphysical foundation and instead endorses a procedural basis of the list. The list 'is not the result of 'a or priori metaphysical investigation into the nature of human beings', as Jömann et al. correctly observe (Jömann et al. 2001, p. 67) but is far more open: Nussbaum suggests that the list is a matter of (real-world) political agreement, which in its Rawlsian version must be understood as involving exercises of imagination similar to what happens in Rawls's 'Original Position':

> Frequently we inform ourselves about alternative possibilities by imagining the form of life that these possibilities would construct, asking ourselves what suffering or flourishing there would be in lives governed by these political principles. (Nussbaum 2006, p. 353)

One can imagine a similar procedure with regard to capabilities as an approach to *ethics*. This would allow room for interpretation. (I will return to this point.)

To show the full normative force of this *ethical* interpretation of the capability approach would require more work. But this short presentation of the theory is sufficient for my purposes in this paper and allows me to proceed with my argument. I will now introduce and discuss the question concerning the relation between capabilities and technology, in particular information technology.

Capabilities and technology

In the literature on the capability approach, technology has only recently emerged as a topic for discussion. Most work concerns development countries and the approach is being applied to various fields in applied ethics, for instance design ethics (Oosterlaken 2009), ethics of risk (Murphy and Gardoni 2008), bioethics (Clague 2006), and ethics of information technology (Johnstone 2007; Wresch 2007; Zheng 2007; Coeckelbergh 2010).

The usual way to define the relation between capabilities and technology is, as Sen did, to conceive of technology as one of the *means* to reach the *aims* (capabilities). Applied to the domain of information technology, the idea is that just having (access to) the resources like a PC or a mobile electronic device is not enough to enjoy, for instance, exercising one's capability for affiliation. Instead, what matters is that the person can actually and effectively use the technology for that kind of activities.

Today the term 'empowerment' is often used to emphasise this shift from means to ends as promoted by the capability approach (see Johnstone 2007). For instance, it is said that we face what is known in computer ethics as the 'digital divide'. This gap does not only concern mere *access* to information technology. Norris has used the term to refer to divergence in Internet access between industrialised societies and developing societies, between information rich and information poor (this also happens in industrialised societies), and between those who *use* this information to engage and participate in public life and those who do not (Norris 2001, p. 4). The third definition, with its emphasis on use, is interesting with regard to empowerment. Viewed from a capability perspective, the digital divide is a gap not so much between those who have access to the Internet and those who have not, but between those who have the skills to use it and benefit from it in their social lives (private and professional) and those who do not have these skills. Thus, if the capability approach is interpreted as a normative framework, the ethical question concerns the extent to which the goals (the capabilities) are reached by means of the technology. Political participation is one of these goals. On the one hand, there are the ultimate human ends (human dignity, justice, human flourishing) articulated by means of the capability approach, which defines, analyses and applies the capabilities that contribute to these ends, such as health, emotions, practical reason, affiliation, etc., and on the other hand, there are the various means to reach these ends (technology, social and political organisation, and so on).

In the next section, I will question this exclusively instrumental view of the relation between technological matters (in particular information technology) and human-ethical matters (capabilities as articulations of human excellence, dignity, justice, etc.). For that purpose I will focus on the issue of human enhancement and its implications for the relation between information technologies and capabilities.

Human dignity or human enhancement?

One reason why the discussion about human enhancement is interesting is that it helps us to question the philosophical-anthropological basis of the capability approach and its assumption that the relation between capabilities and technology is merely instrumental. Let me explain this.

Human enhancement and the question concerning the relation between humans and technology

Human enhancement aims at using technology to create better humans. What this means can best be clarified by saying what it is not: its aim is not therapeutic: it does not restore humans to a 'normal' state but wants to create humans that are 'better than normal', 'better than human'. Information technology is one of the 'converging technologies' that can be used for this purpose, next to interventions in the human genome (e.g. by means of germ line engineering). For instance, Ray Kurzweil has suggested that we might 'upload' ourselves into digital spheres (Kurzweil 2005). Perhaps we are already 'enhanced' given that we extend our mind by using the internet: cognitive functions such as memory are 'extended' with the help of information technology. Applied to social network sites, one could say that its related social-technological practices 'extend' or 'enhance' our capability of affiliation. Like letters, phones, mobile phones, and other communication technologies, they extend our capability from face-to-face interactions to distant interactions. Moreover, they expand the quantity and frequency of possible contacts, enlarging our social world and revealing it as a network.

As this example shows, the distinction between therapy (and current or 'normal' use) and enhancement is vague. The alphabet, letters, and letter-writing were already a form of 'enhancement', not only in terms of communicative abilities but also of memory and reflection. Writing has always been created 'external' capacity for memory and has influenced the way we think (writing as a technology for thinking). Consider also the dramatic increase in the life span of people in the course of the twentieth century, caused by mere 'therapeutic' measures in medicine and health policy. Put in the language of capabilities, these 'hardware' modifications and 'extensions' meant that people could *do* more, here: could enjoy improved capabilities of affiliation, health, and other capabilities.

In spite of this blurred boundary between enhancement and what is considered to be 'normal' or 'therapeutic', proposals for future human enhancement (e.g. by means of genetic modification) made by 'transhumanists' such as Bostrom (2003, 2005) and Harris (2007) have invited opposition from philosophers who fear a 'Brave New World' or see human enhancement as a threat to human dignity (see for example Kass 2003; Habermas 2001; Fukuyama 2002). For instance, Habermas has argued that if parents can decide about the genome of their (future) children, this would restrict their children's range of options.

Against the 'Brave New World' objection, Agar and Harris have proposed 'liberal' versions of human enhancement (Agar 2004; Harris 2007). And in response to Habermas's objections to genetic enhancement, Bostrom has argued that human enhancement is neither a threat to freedom nor to dignity. First, he argues that the child would not have less freedom than in the case when its genome is left up to chance. Rather, an enhanced individual 'would

enjoy significantly more choice and autonomy in her life, *if the modifications were such as to expand her basic capability set*. Being healthy, smarter, having a wide range of talents, or possessing greater powers of self-control are blessings that tend to open more life paths than they block' (Bostrom 2005, p. 212; my emphasis). I will return to this thought. Second, Bostrom sees no reason why 'posthumans' would have less dignity:

> Transhumanists (…) insist that dignity, in its modern sense, consists in what we are and what we have the potential to become, not in our pedigree or our causal origin. What we are is not a function solely of our DNA but also of our technological and social context. Human nature in this broader sense is dynamic, partially human-made, and improvable. (Bostrom 2005, p. 213)

It is neither my purpose to defend human enhancement nor to provide a comprehensive overview of the arguments for and against. Here I am interested in how this discussion can contribute to a critique and alternative development of the capability approach. Let us consider the following significant assumption of the capability approach. Nussbaum's version of the approach sees technology only as a means, an instrument, which has nothing to do with what the human is (and with human dignity and the central capabilities). However, the transhumanist view as summarised above suggests otherwise. Capabilities—and hence what humans are—are not fixed but change together with our technological and social context. This is not only true for specific new capabilities (imagine that technology would give us wings) but also for the core capabilities that are related to what we consider (the core of) the human. Technology is not a mere 'condition' for human being in the sense of a means that can be used to achieve human ends; rather, human existence is *already* a human-technological existence. As Plessner put it in the language of an entirely different tradition (twentieth century philosophical anthropology), we are 'naturally artificial' (Plessner 1928), technology is part of what we are.

If this is true, then those who oppose human enhancement can no longer rely in their arguments on a static view of human nature and an instrumental view of technology. Moreover, a discussion of the relation between human enhancement and capabilities allows us to reframe the normative question of the capability approach *and* to reformulate the normative question concerning human enhancement at the same time.

Using the language of capabilities, we could start by asking: Should we aim at human *development* (reaching minimum levels of capabilities) and perhaps human *excellence* (maximising levels of capabilities), or should we aim at human *enhancement* (changing the capabilities by technological or other means)? Considered as a normative project and redefined in terms of capabilities, transhumanist visions of human enhancement such as Bostrom's aim not at evaluating or measuring the distance between existing levels and fixed, ideal levels of capabilities, but aims at moving and lifting the very 'ideal' or 'maximum' levels of capabilities themselves. Perhaps it even wants to add new capabilities and erase others.

(It remains unsure what the status of new capabilities would be. Would they be 'central'? Arguably, the status of capabilities could change and further reflection on the status of new capabilities might blur the strict distinction between 'central' and 'specific' capabilities: some capabilities which we first regarded as specific may come to be seen as 'central'. Take up the example again: if humans had wings then we might come to regard that as a 'central' capability and anyone taking away the wings would then be regarded as violating entitlement to a human capability. Indeed, flying with wings could be regarded as a changed capability of bodily integrity/freedom of movement. A human without wings might be considered as violated in her bodily integrity. Thus, it is not always clear if a capability is 'new' and whether or not it is, is subject to societal-cultural change. The example of wings also suggests that proponents of human enhancement may want to enhance aspects such as beauty or intelligence and it remains to be discussed if and how these relate to capabilities—central or otherwise. Many of us would not put them on the list of central capabilities. However, as Nussbaum argues, the list is open-ended and its very boundaries could be the object of political deliberation.)

Of course, as with the standard capability approach, various technologies (as well as educational and other practices) can be considered as means for reaching the aim (maximizing capabilities and adding new ones). But the difference with Nussbaum's view is that here the norms (defined as end-levels of the capabilities) or new norms (the precise form of the new capabilities) are not fixed. In this way, this view goes beyond the ends/means scheme: the meaning of the capabilities themselves (the standards, the norms, the criteria, and the aims) are no longer considered as unchangeable. There is a dynamic relation between capabilities and technologies which can neither exhaustively nor adequately be defined in terms of ends and means.

However, if capabilities are *already* changing and have always changed, then the initial ethical question with regard to human enhancement (development or enhancement) is not the right question to ask. The normative question is no longer *if* we should change human nature but *how* we should change it. Moreover, given the blurred line between 'enhancement' and what is 'normal' or 'therapeutic', the question is no longer about 'enhancement' but

about *change*. But what is the object of change? Using the capabilities concept, we can now ask more precise questions at a more 'workable' level of analysis. First we must ask descriptive questions about *which* capabilities and related practices change in which contexts, *how* they change, and as a result of *which* interventions they change; we must ask about the possible effects if we did *this* particular technological-social intervention, created *this* environment etc., before we can make decisions about which changes and indeed norms are desirable. For example, we should first know what some particular Internet-related practices like on-line social networking do (or would do) to our capabilities before we can decide the normative question about the desirability of these techno-human practices. If there are plans for a new technology, it means we have to try to *imagine* what it would do to human capabilities.

Using the language of capabilities allows us to ask precise normative and descriptive philosophical questions at a level that is situated between vague general notions such as 'human nature' (often used in traditional philosophy) and all too concrete and ontologically atomistic notions such as 'genes', 'neurons', or 'codes' (often used by scientists). This can throw new light on a long-standing methodological difficulty. Ethics and philosophical anthropology are usually challenged to choose between naturalist and non-naturalist approaches. For instance, we are asked to choose between a naturalist view of the human as embodied *brain* (neuroscience as a gateway to knowledge about the human, determinism) and the human as having a 'special' moral and metaphysical position (involving notions such as free will—for instance Kantian views of the human). But if we use capabilities as an in-between concept, this might turn out to be a false dilemma for at least the following reasons.

Scientific challenges to the instrumentalist assumption

First, naturalist or scientific views need not be reductionist and even from a 'purely' scientific point of view it is not very fruitful to deny the interrelations or even merging of 'natural' and 'artificial', of 'nature' and 'culture', of humans and technology. To forge firm conceptual connections between, on the one hand, the human and, on the other hand, technological practices and social contexts, is not only imperative for philosophers who want to understand the human but is also a matter of doing good science.

Consider controversies about (interventions in) the human genome. Those who argue against 'genetic enhancement' or those who embrace the idea without knowing much about it, may actually overestimate the impact of interventions in the 'genes' of people and hold a more deterministic view than the scientists who work on it. As Lewontin has argued, genes should not be considered in isolation; instead, biologists now

accept that there is a complex interplay between genes, organism, and environment (Lewontin 2001). There is neither determinism nor reductionism here: biological traits are understood as being the result of genes, chance, and environment; organisms are open systems (Lewontin 2001, 113). Genes are neither a 'blueprint' nor a central controller. Moss has argued that 'gene-centric' views, which place genes in central control of the organism's development, must be replaced with a de-centralized approach that includes intercellular, biochemical and sociological factors (Moss 2003). And Salvi has shown that the claim that it is possible to manipulate human germ cells in a pre-ordinate way is unrealistic, since the long-term consequences of such interventions in individuals, in generations, and in populations is unpredictable: 'we cannot predict whether the gene manipulation will produce a possible expression of the desired character or if it will cause a cascade of events determining a gene dysfunction […] or subsequent mutations' (Salvi 2002, 74). And if we cannot predict the phenotypic expression of bioengineered genes, then we cannot know what it will do to the individual—including whether or not it will 'enhance' that individual. Salvi even calls germ line engineering to enhance humans 'biologically nonsensical' (Salvi 2002, 76). This casts doubt on the promises concerning germ line engineering made by transhumanists and suggests that both defenders and opponents of human enhancement risk to assume a simplistic, reductionist view of what science and technology can know and do.

Ethics of information technology is vulnerable to a similar risk *if and in so far as* its arguments are based on outdated and inadequate ontologies and anthropologies. People working in information science and information technology have moved on from considering symbolic systems in isolation (traditional AI) to non-Cartesian approaches in cognitive science and philosophy of mind focusing on embodied cognition, learning by interaction with the environment, extended mind (Clark and Chalmers 1998; Clark 2003), and so on. AI has moved from the design of intelligent computers (say, a computer that can play chess) to the design of intelligent *robots*, that is, embodied and interactive AI systems that learn by interacting with their environment, display 'emotions', etc. This orientation may still be 'naturalist' or 'informationalist[2]' but fits better with approaches in the social and human sciences—and indeed the life sciences—than previous methodologies. Moreover, views such as the 'extended mind' thesis (see again Clark and Chalmers) are compatible with non-instrumentalist views of the relations between humans and technology, since they do not consider infor-

---

[2] This is how I would describe Floridi's views.

mation technologies as mere tools that stand apart from our minds but as part of our cognitive-embodied whole.[3]

If ethics of information technology wants to take these new developments into account, it has various options to do this. Here I propose that we explore 'capabilities' as a concept that allows us to make 'translations' from science to ethics and back. Capabilities depend on minds-as-embodied, but also on the technologies and social environments that are firmly linked with that cognitive-embodied whole. Technologies, then, are not a mere means that contribute to human ends, but are part of a techno-anthropological whole that has technological, cognitive, biological and social dimensions and which constitutes individual capabilities. Moreover, these capabilities are not fixed but are unstable and changing. For instance, the capability 'political participation' emerges from a dynamic interplay of beliefs, values, emotions, and the technological-social environments in which these dimensions are shaped (which in turn changes these environments). If the concept of 'capabilities' is understood in this way, it allows us to talk at a sufficiently high level of abstraction and organisation, thus avoiding atomistic and reductionist views of humans, while at the same time taking distance from philosophical approaches that use vague notions such as human dignity without making explicit what it means for beings like us who can only function, exist, think and live by interaction with concrete technological, social environments as cognitive-embodied beings.

Viewed from this perspective, the discussion about human enhancement in relation to information technology is not about 'technology'—at least if that term is understood in terms of material devices such as computers and mobile phones considered in isolation from the human. It is about the human-as-already-shaped-by-technology. Furthermore, and this is important given my purpose in this paper, this perspective also allows us to revise some crucial assumptions that support current versions of the capabilities approach. Technology does no longer appear as a mere means to human ends—i.e. as material or technological conditions for capabilities—but as part of continuously changing human-technological functionings and practices which resist categorisation in terms of means or ends alone.

An additional advantage of the capability approach is that it allows us even to go beyond 'extensionalism' and discussions about 'where the mind is' since it takes a functional approach. The stress is on what people (are able to) do rather than on the mind or cognitive architecture and its much discussed relation to brains and bodies. For instance, instead of comparing brains (wetware) to computer hardware, or human minds to robot 'minds', a focus on capabilities allows us to focus on how it is to live our lives with a particular information technology or information *practice* like using a social network site. The entry of analysis is the capability (e.g. social affiliation), what the technology enables us to do and what we actually do, rather the particular hardware or software (e.g. a PC or a mobile phone). As such, the concept of capability as a functional approach transcends mind–body, software-hardware, and other dualisms and is in this form *different* from other scientific approaches that try to solve mind-brain and mind–body puzzles. At the same time, it pays sufficient attention to the material and social conditions that make functioning possible.

Second, however, if this methodological intervention is to be really successful with regard to the aim of overcoming the previously mentioned naturalism/anti-naturalism problems and the problem regarding the human-technology relation, a further step is necessary. Scientific, naturalist versions alone are not enough; we also need to attend to human subjectivity and turn to concepts that belong to a different, more phenomenological-hermeneutic tradition: engagement, interpretation, translation.

Ethics and the hermeneutics of capabilities

Hermeneutics, capabilities, and technology

So far it seems as if I have been talking about human-technological practices and capabilities or (potential) functionings as if we can look upon them from the position of 'Nowhere' (Nagel), from an 'objective' point of view. But is this possible? Of course we can become aware of ourselves as the particular humans we are and we can even generalise about 'the human'. But recognising the possibility of *self-consciousness*—which I take Plessner to do when he coins the concept of 'ex-centricity', we can stand outside of our own centre—should not be confused with the possibility of taking an absolutely objective point of view that is alienated from our personal, social, and deeply-human concerns. We are always already *engaged* observers. This means that we cannot talk about capabilities, beliefs, technologies, social environments, and so on without being influenced (but not determined) by the very elements we try to study.

Of course this is a long-standing issue in philosophy and (philosophy of) social science, and I will not offer a full account of this methodology here. But if we wish to revise the capability approach in the direction I suggested above, it is important to realise that although current scientific thinking about the relation between humans and technology is already very helpful to question the mentioned

---

[3] Note that the 'extended mind' view is controversial since it contradicts common sense and naturalist 'intracranialist' views (see for example Adams and Aizawa 2008 and 2009).

assumptions of the capability approach, it is not adequate to capture the *hermeneutic* dimension of thinking about the relations humans, capabilities, and technologies. Neither capabilities nor the cognitive, technological, and social elements that shape them are given to us as naked 'facts'. They have to be constructed by means of work of interpretation, communication, and translation.

For example, if particular Internet-based platforms that are said to promote social networking are studied in terms of their influence on cognitive and social 'factors'—and hence certain capabilities—then this is not a matter of 'getting the facts right' but of carefully constructing what meaningfully can be said about the new technological possibilities (current and future), the interplay of these different elements within particular capability constellation, the interplay of various capabilities, and the changes in these elements. Scientific studies can contribute to this but should not be seen as presenting an 'objective' description *as opposed to* 'subjective' interpretations; both go hand in hand. 'The truth about Twitter' or 'the truth about Facebook' is not out there to be harvested; it has to be constructed in slow, difficult process of interpretation and communication (i.e. dialogues and discussion). Scientific research can contribute to this work of interpretation but does not exhaust the range of methodological tools we have.

This hermeneutic dimension is missing in the literature on capabilities (for instance, what the capability 'health' is and means for a particular person in a particular context is, apart from other things, a matter of interpretation), but usually it is also absent in the cited literature on human enhancement, ethics of information technology, and embodied and extended cognition. If we want to use their insights to revise the capability approach, therefore, we should take the hermeneutical dimension into account. For instance, the 'extension' of minds and how it constitutes particular capabilities is not something that stands as a 'fact' but is a compelling interpretation of techno-human experiences that has to be confronted with other interpretations and (histories of) changing in techno-human practices.

Such a hermeneutics does not threaten the normative-ethical ambitions of the capability approach. On the contrary, both presuppose one another. Interpretation is not ethically neutral but involves judgment. But it also co-constitutes that judgment: at the same time ethical judgment depends on adequate interpretations and descriptions/constructions of the practices it evaluates and of the concepts (e.g. the norms) it uses to evaluate these practices. As said, what a capability means in a particular context is partly a matter of interpretation. Moreover, in deliberative and reflective practice—including the political deliberation recommended by Nussbaum's capability approach—it is

hard and perhaps even undesirable to make a strict distinction between the 'empirical', imaginative, interpretative and evaluative aspects. To decide if we want to further pursue a particular information-technological possibility, we have to imagine or try out in practice what it does to our 'capabilities'. Capabilities cannot be considered and used in isolation since they cannot be strictly distinguished from the techno-social environments that shape them; their meaning only emerges in these imaginative-interpretative, deliberative, and empirical-interpretative processes, which *already* have an evaluative aspect and co-constitute the evaluation.

Finally, it is important to note that both the evaluation and the objects of evaluation are subject to change. Technologies, capabilities, and our evaluation of them do not have a fixed 'status' that can be determined once and for all. Techno-human practices, values, humans, societies—they all change. Therefore, any list of capabilities is only in appearance static: not only because new capabilities might emerge or because their articulation/expression is necessarily incomplete (as Nussbaum would be ready to admit), but also because the very *meaning* of the capabilities changes. 'Behind' the words that appear to be set in stone (this is what human dignity is, this is what human nature is) lies a fluid, plasmatic techno-human reality subject to changing interpretations. For example, behind 'physical health' we find the history of medicine and health care, which is itself a hermeneutical enterprise dependent on new technological and conceptual developments. (For instance, consider how the discussion about 'human enhancement' throws new light on the history of medicine *as a history of enhancement*.)

To conclude, I have made suggestions about how the discussion of *human enhancement* would gain from a capabilities approach, but I have also shown that we can enrich the *capability approach* as an ethical framework by abandoning its instrumentalist assumption about the relation between humans and technology. Alternatives can be explored by learning from recent thinking in the fields of (philosophy of) human enhancement and cognitive science, which are moving beyond atomistic and reductionist views of humans and are starting to consider the various ways in which humans are shaped by their techno-social environment (and vice versa). However, we should take not forget to add a hermeneutical and historical-dynamical perspective to these insights if we want to make *some* progress with regard to the naturalism/non-naturalism problem.

Towards a re-interpretation of Nussbaum's capability approach

Although many users of the capability approach take an exclusively scientific approach, the proposed hermeneutic turn proposed here in relation to the capability approach is
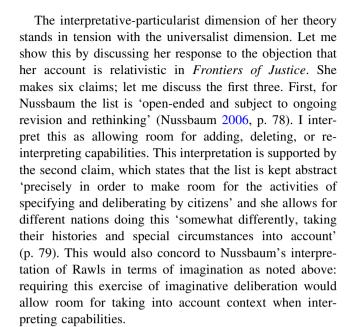
not entirely alien to Nussbaum's version of the capability approach. We can and must therefore engage with and highlight existing aspects of the capability approach that are compatible with the interpretative direction outlined above.

For a start, Nussbaum does not deny that technology and (social) context change capabilities—including the interpretation of capabilities. This is recognised in the literature. For instance, as Jömann et al. remark, Nussbaum's approach is 'thoroughly universalistic' yet at the same time 'a more particularistic or Aristotelian perspective is embedded in Nussbaum's overall conception, namely in her openness of any human capability to a spectrum of diverse tradition- and culture-related realizations and interpretations' (Jömann et al. 2001, pp. 65–66). The authors point to Nussbaum's insistence that the list implies 'multiple realizablity'. Indeed, in *Women and Human Development* she says that the list is open-ended since one might debate how 'fixed' each item should be and the items are 'to some extent differently constructed by different societies':

> Indeed, part of the idea of the list is its *multiple realizability*: its members can be more concretely specified in accordance with local beliefs and circumstances. It is thus designed to leave room for a reasonable pluralism in specification. (Nussbaum 2000, p. 77)

By saying this she suggests not only that possibly some items on the list might be removed or given less weight[4] but also that the threshold level needs to be determined by political consensus (p. 77).

Nussbaum's version of particularism raises the well-known problem of relativism. It seems that if we embrace her view, we also have to accept that different situations and contexts will lead to different interpretations of the capabilities and of the thresholds. However, whether or not this view is relativistic depends on how we interpret other passages in Nussbaum. Nussbaum remains at least ambivalent on this point. Let me discuss this further, not with the aim to decide if Nussbaum's view is relativistic (this would merit a different work), but with the aim to further refine my interpretation of Nussbaum's assumptions concerning the human-technology and capability-technology relation.

The interpretative-particularist dimension of her theory stands in tension with the universalist dimension. Let me show this by discussing her response to the objection that her account is relativistic in *Frontiers of Justice*. She makes six claims; let me discuss the first three. First, for Nussbaum the list is 'open-ended and subject to ongoing revision and rethinking' (Nussbaum 2006, p. 78). I interpret this as allowing room for adding, deleting, or re-interpreting capabilities. This interpretation is supported by the second claim, which states that the list is kept abstract 'precisely in order to make room for the activities of specifying and deliberating by citizens' and she allows for different nations doing this 'somewhat differently, taking their histories and special circumstances into account' (p. 79). This would also concord to Nussbaum's interpretation of Rawls in terms of imagination as noted above: requiring this exercise of imaginative deliberation would allow room for taking into account context when interpreting capabilities.

Perhaps this interpretation would also allow *new* capabilities to be added to the list, for instance capabilities that came about by using human enhancement technologies. We could evaluate this by informing ourselves about a particular possibilities offered by a technology and then imagine (to use Nussbaum's words) 'the form of life that these possibilities would construct, asking ourselves what suffering or flourishing there would be' (Nussbaum 2006, p. 353) in lives governed by that new capability and that new technology. Such a use of the capability approach would go beyond the usual use in terms of end/means (capabilities as ends and technology as means) since we would have to imagine how both the technology and the capability shape possibilities for forms of life.

Let me show how this would go beyond present uses of the capability approach in relation to human enhancement and explore how more attention for the interpretative side of the capability approach can assist this aim.

For example, Cooke argues that Sen's capability approach can be used as a framework to ensure (a basic level of) freedom and equality. One of her arguments is that 'the proper moral goal of altering the germ-line is to bring people toward a level of basic freedom rather than to make choices for future generations' and that therefore germ-line engineering should only ensure basic levels of capabilities (Cooke 2003, p. 43). Whether or not we agree about her claim that it should ensure basic levels only, Cooke's approach assumes an instrumentalist conception of technology. There are goals (capabilities, freedom, equality) and technology is a means to realise these goals. Nevertheless, in Cooke's article we can also discern some steps towards a more interpretative view of capabilities. First, she says that Sen leaves the capabilities vague enough so that they can be specified 'on a case-by-case

---

[4] This touches the issue of hierarchy, the relative importance of the capabilities. On the one hand, Nussbaum claims that all capabilities are 'of central importance' (Nussbaum 2000, p. 81), on the other hand the consensual, contractarian side of her argument casts doubt on this. Moreover, at some point she even says that practical reason and affiliation 'stand out as of special importance' (p. 82). This is one of the many remaining ambivalences in her version of the capability approach.

basis', but this question of application does not seem to touch the definition of capabilities. A further step is to claim that while there are basic capabilities, societies and people could specify for themselves specific capabilities (e.g. playing the violin). According to Cooke, cultures have 'the freedom to specify further capabilities' (p. 50). If this is allowed, one could imagine that advanced technological cultures could make use of human enhancement to add *specific* capabilities, which would we allowed only to the extent that *basic* capabilities are not diminished. However, these steps remain firmly within the means-ends dualism. The only point when Cooke comes near to questioning the relation between capabilities and (enhancement) technologies is in what I see as the last step towards a more interpretative view: she says that 'many enhancements are open to social interpretation' and admits that 'concepts like health, disease and malady are normative' (p. 57). (However, she retains a distinction between these more 'objective' concepts and 'concepts that go into interpreting social capabilities'.) Thus, in Cooke's interpretation of Sen's capability approach there is room for interpretation and there is no reason why Nussbaum could not agree with this. A capability approach to ethics of human enhancement, then, would require us to imagine forms of life in which capabilities are changed or added—capabilities and technological changes which are always interpreted.

So far, it looks as if Nussbaum (and perhaps Sen also) would go some way towards a 'strong' interpretative understanding of capabilities of the sort I suggested above by using the term hermeneutic. However, in her third response to her relativist opponent Nussbaum then takes a Kantian-Rawlsian turn. She uses Rawls's phrase 'freestanding': the list is a 'freestanding' moral conception, 'freestanding' in the sense that it is not grounded in 'metaphysical ideas of the sort that divide people along lines of culture and religion' (Nussbaum 2006, p. 79), it does not rely on 'a particular metaphysical or teleological view' (Nussbaum 2000, p. 83). With these remarks, Nussbaum departs not only from Grotius (who based his view on a metaphysical theory of human nature) but also introduces again the liberal Kantian-Rawlsian line of her version of the capability approach,[5] which stands in tension with the more interpretative, particularist line. The first line echoes the liberal-philosophical conception of a 'pure' public sphere of politics separated from the private sphere with its cultural and religious views. In this view, capabilities are seen as belong to the first sphere, notions that

'can be endorsed by people who otherwise have very different conceptions of the ultimate meaning and purpose of life' (Nussbaum 2006, p. 79). But from a full-blown hermeneutic perspective, such a purified notion does not make sense; the interpretation of capabilities depends—among other things—on such 'cultural' and 'religious' views, on the meaning and purpose we ascribe to human life. Such views differ and, as Jömann et al. phrase what they call the 'relativist' objection, it is 'unreasonable to believe that we can sidestep fundamental cultural discrepancies by appeal to an "overlapping consensus" as regards norms and values' (Jömann et al. 2001, p. 68). To what extent there really are such fundamental differences is questionable, but in any case there are relevant differences and arguably Nussbaum's account needs to be more sensitive to them. Furthermore, the interpretation of capabilities also depends on technological developments, which, as argued, are not just a means to realise goals as 'freestanding' moral conceptions, but also shape these goals and purposes. Moreover, the list is then not merely a 'partial' moral conception introduced for political purposes only (p. 79) but a 'substantive' ideal of the good life—one that is not freestanding but dependent on social, technological, and cultural context. Leaving aside well-known differences between the capability approach and Rawlsian contractarianism,[6] Nussbaum's Kantian and Rawlsian intuitions prevent her from fully embracing this hermeneutic route.

Conclusion

Capability thinking has moved from being an approach to 'human development' (as conceived by Sen) to an articulation of 'human dignity' (Nussbaum) and perhaps a space of possibilities for 'the good life' or 'human excellence'. Should it also broaden its scope—or indeed *change* its orientation—to 'human enhancement'?

This paper suggests that the capability approach can be a useful way of to specify the level of analysis in human enhancement discussions, moving the focus from 'genes', 'code' or 'neurons' to capabilities. However, it has been argued that any interpretation of what these capabilities mean is itself dependent on the techno-human practices under discussion. When we use the capability approach as a normative tool in ethics of information technologies, therefore, we have to take into account that the concept we use is not independent from the technologies we wish to evaluate. Exploring alternative conceptions of human-technology relations, we can learn from scientific and

---

[5] Nussbaum does often acknowledge this Rawlsian heritage but strangely enough in *Women and Human Development* she presents this conception as an interpretation of Aristotle: 'As I interpret Aristotle, he understood the core of his account of human functioning to be a freestanding moral conception, not one that is deduced from natural teleology or any non-moral source' (Nussbaum 2000, p. 76).

[6] For example, the capability approach is outcome-directed rather than procedural (Nussbaum 2006, p. 82) and it 'stresses the animal and material underpinnings of human freedom (p. 88).

hermeneutical approaches, which could re-interpret and enrich the capability approach. One way to do this is to focus on the interpretative side of the capability approach as proposed above.

I conclude that instead of facing a choice between development (or dignity, excellence) and enhancement, we have to reflect on *how* we want to shape our lives, our societies, and ourselves as humans and as individuals. For this purpose, we have to engage in a cumbersome hermeneutics that dances between unstable interpretations of technological changes, changes in the meaning of capabilities, changes in individual and societal practices, value changes, and dynamic relations between these changes. Then we can make up our minds about which changes we really want, taking into account that there will always be limits to what we can control and guide—as humans or as posthumans.

References

Adams, F., & Aizawa, K. (2008). *The bounds of cognition*. Malden, MA: Blackwell.

Adams, F., & Aizawa, K. (2009). Why the mind is still in the head. In M. Aydede & P. Robbins (Eds.), *Cambridge handbook of situated cognition*. Cambridge: Cambridge University Press.

Agar, N. (2004). *Liberal eugenics: In defence of human enhancement*. Malden: Blackwell.

Bostrom, N. (2003). Human genetic enhancements: A transhumanist perspective. *Journal of Value Inquiry, 37*(4), 493–506.

Bostrom, N. (2005). In defense of posthuman dignity. *Bioethics, 19*(3). Available on-line at http://www.psy.vanderbilt.edu/courses/hon182/Posthuman_dignity_Bostrom.pdf.

Clague, J. (2006). Patent injustice: Applying Sen's capability approach to biotechnologies. In S. Deneulin, M. Nebel, & N. Sagovsky (Eds.), *Transforming unjust structures: The capability approach*. Dordrecht: Springer.

Clark, A. (2003). *Natural-born cyborgs: Minds, technologies and the future of human intelligence*. New York: Oxford University Press.

Clark, A., & Chalmers, D. (1998). The extended mind. *Analysis, 58*(1), 7–19.

Coeckelbergh, M. (2007). Principles or imagination? Two approaches to global justice. *Journal of Global Justice, 3*(2), 203–221.

Coeckelbergh, M. (2010). Health care, capabilities, and AI assistive technologies. *Ethical Theory and Moral Practice, 13*(2), 181–190.

Cooke, E. (2003). Germ-line engineering, freedom, and future generations. *Bioethics, 17*(1), 32–58.

Fukuyama, F. (2002). *Our posthuman future: Consequences of the biotechnology revolution*. New York: Farrar, Strauss and Giroux.

Habermas, J. (2001). *Die Zukunft der menschlichen Nature: Auf dem Weg zu einer Liberalen Eugenik*, translated as *The future of human nature* (trans. H. Beister and W. Rehg) London: Polity Press, 2003.

Harris, J. (2007). *Enhancing evolution: The ethical case for making better people*. Princeton: Princeton University Press.

Johnstone, J. (2007). Technology as empowerment: A capability approach to computer ethics. *Ethics and Information Technology, 2007*(9), 73–87.

Jömann, N., Kurbacher, F. A., & Suhm, C. (2001). Universal capabilities vs. cultural relativism. In A. Kallhoff (Ed.), *Martha C. Nussbaum: Ethics and political philosophy: Lecture and colloquium in Münster 2000*. Münster: Lit Verlag.

Kass, L. (2003). Ageless bodies, happy souls: Biotechnology and the pursuit of perfection. *The New Atlantis, 1*(Spring 2003), 9–28.

Kurzweil, R. (2005). *The singularity is near: When humans transcend biology*. New York: Viking/Penguin Group.

Lewontin, R. (2001). *The triple helix: Gene, organism, and environment*. Cambridge, MA/London: Harvard University Press.

Moss, L. (2003). *What genes can't do*. Cambridge, MA: MIT Press.

Murphy, C., & Gardoni, P. (2008). The acceptability and the tolerability of societal risks: A capabilities-based approach. *Science and Engineering Ethics, 14*, 77–92.

Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge: Cambridge University Press.

Nussbaum, M. C. (2000). *Women and human development: The capabilities approach*. Cambridge: Cambridge University Press.

Nussbaum, M. C. (2006). *Frontiers of justice: Disability, nationality, species membership*. Cambridge, MA and London: The Belknap Press of 416 Harvard University Press.

Nussbaum, M. C., & Sen, A. (Eds.). (1993). *The quality of life*. Oxford: Clarendon Press.

Oosterlaken, I. (2009). Design for development: A capability approach. *Design Issues, 25*(4), 91–102.

Plessner, H. (1928). *Die Stufen des Organischen und der Mensch.* In Gesammelte Schriften Bd. 4, eds G. Dux et al.., Frankfurt a. M.: Suhrkamp, 1981.

Robeyns, I. (2005). The capability approach: A theoretical survey. *Journal of Human Development and Capabilities, 6*(1), 93–117.

Salvi, M. (2002). Genetics' dreams in the post genomics era. *Medicine, Health Care and Philosophy, 5*, 73–77.

Sen, A. (1999). *Development as freedom*. Oxford/New York: Oxford University Press.

Wresch, W. (2007). 500 million missing web sites: Amartya Sen's capability approach and measures of technological deprivation in developing countries. In E. Rooksby & J. Weckert (Eds.), *Information technology and social justice*. Hershey: Information Science Publishing.

Zheng, Y. (2007). *Exploring the value of the capability approach for E-development*. Paper presented at the 9th International Conference on Social Implications of Computers in Developing Countries. Sao Paulo, Brazil.