



POVERTY & TECHNOLOGY

ON JUSTICE, TECHNOLOGY &
HUMAN DEVELOPMENT

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Philosophy of Science, Technology and Society

Cover photograph

Children in Block E, Rehoboth, Namibia. August 2010.

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Abstract

In this world, there are many people that live in poverty, while at the same time scientists and engineers create new technologies that solve problems that were too big to solve only decades ago. It would seem that if we did our best effort, a technological fix for poverty would be at our doorstep. Yet at the same time, could it not also be true that some new technology only increase poverty? The aim of this thesis is to investigate the relation between technologies and poverty, from the point of view of justice.

The justice approach that I choose in this thesis is the Capability Approach, an approach that looks at what a person can truly do and be (his or her capabilities), instead of what he or she has or achieves. More specifically, the Capability Approach of Martha Nussbaum is used as a more concrete interpretation of the more general approach that Sen introduced. Based on this version of the Capability Approach, poverty is then defined as violation of the minimal right to vital security, or the hindrance of attaining social goods.

A person's (lack of) capabilities can be influenced by technologies either by directly introducing or prohibiting capabilities, or by influencing our perceived choices between capabilities, or by doing either one indirectly. Because of this, the introduction of a (new) technology in a society should include an assessment of how the technology influences capabilities. In this assessment, interplay between technology experts and local actors can provide valuable insights that can be beneficial for citizens, governments, and corporations.

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1 INTRODUCTION

“Overcoming poverty is not a gesture of charity; it is an act of justice”; words that were spoken by Nelson Mandela at the Live 8 concert in 2005. Two decades had passed since Live Aid – a charity event for famine-struck Ethiopia – but still Africa needed help. The goal in 2005 was not to raise money, but to raise public awareness and political commitment; awareness and commitment for helping ‘the poorest of the poor’. In the year 2000, the United Nations had already ambitiously set up their Millennium Development Goals, committing the member states to (1) fight poverty and hunger, (2) give universal access to education, (3) end gender discrimination, (4) improve child and maternal health, (5) halt the spread of HIV/AIDS, while (6) ensuring environmental sustainability and (7) a fair international position for all countries. But now – near the target date of 2015 – the progress towards many of the goals seems to be too little¹. What can be done to realize these goals?

Looking at the current state of the world, it is remarkable that while the highest levels of welfare have risen steadily over the past centuries, most of the world’s population still lives under circumstances marked by deprivation. Four billion people are deprived of sufficient nutrition, clean water, health care, education, or other needs for a

¹ Millennium Development Goals: 2012 progress chart, <http://www.un.org/millenniumgoals/reports.shtml> (20 December 2012)

basic level of welfare. As Nelson Mandela – among others – claimed, this is not an issue of charity, but an issue of justice. That claim gives the problem another dimension: a moral one. Not being charitable is not immoral, but being unjust is. So why is extreme poverty a problem of justice? Can justice really help solve the problem? And would everybody agree with that?

Despite the attention that extreme poverty has received in the last decades, the results of fighting it are not impressive. There are of course the stories of some countries in Asia and South America that have seen a steady increase in economic growth, increasing the living conditions for many of their citizens, but for many other countries – especially in Africa – poverty proves to be difficult to eradicate.

So why don't we transfer the 'proven' principles? For the rich countries in the world, the road to wealth was paved with technology. Sanitation, medicine, the printing press, steam engines, motorized transport, and communication technologies are just a few of the technologies that have driven the welfare levels up, directly or indirectly. Can't we use these technologies to justly improve the living conditions of people in less developed countries?

1.1 Problem description

The problem area that I have described has multiple aspects: justice, human development, and technology. *Justice* concerns the observation that many people live under conditions that are below our standards of human dignity, while at the same time others live in excessive wealth. *Human development* is in the list because we want people to develop their lives, not only accept that what is given out of charity. This is nicely described with the Chinese proverb "Give a man a fish and he will eat for a day. Teach him how to fish and he will eat for a lifetime". *Technology* has always been a driving force in human development and it may be put to use to advance human development. Together, these aspects form the parts of the main question that I will investigate:

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How can the lives of the poor be given attention and improved in a just way in the development of new technologies and the introduction of existing technologies?

The aim of my research, and the type of answer I hope to give, is to describe a process that will lead to technologies that can fulfill the goal of improving the lives of the poor in a just way. How these technologies should actually be designed is outside the scope of this paper, though it will sometimes be touched upon. To find the answer to the main question, I will first discuss three issues that are important in the question. First, I will elaborate on the idea of justice that I will use, after that I will look into poverty, followed by an account of the influence of technology. In the end, these three sub-questions will form the basis for answering the main question concerning the development of new and the introduction of existing technologies.

The first main topic that I will discuss (Chapter 2) is justice, more precisely its distributive part: justice that deals with what people are entitled to. Part of the discussion of justice will be about what counts a good life. The topic of the next chapter will be poverty (Chapter 3), in which I will use the earlier conception of justice to discuss when people can be considered to be poor. The third topic will be what the influence of technology can be on human lives (Chapter 4): how, if at all, could technology actually influence the lives of people? Finally, given these definitions of justice and poverty, and the description of the role of technology on human lives, I will discuss (Chapter 5) how the creation and introduction of technologies can take place so that the improvement of the lives of the poor is taken into account.

2 JUSTICE AND WELL-BEING

“But in this new century, millions of people in the world’s poorest countries remain imprisoned, enslaved, and in chains. They are trapped in the prison of poverty. It is time to set them free. Like slavery and apartheid, poverty is not natural. It is man-made and it can be overcome and eradicated by the actions of human beings. And overcoming poverty is not a gesture of charity. It is the protection of a fundamental human right, the right to dignity and a decent life. While poverty persists, there is no true freedom.” (Mandela 2005)

The words of Nelson Mandela sound true, at least to me: it does not feel right that so many people are starving, while so many others live in excessive wealth. But is the current distribution of standards of living in the world merely uncomfortable or can we really call it unjust?² When it is the former, we cannot put any strong demands on those who have a high standard of living to help those who have a much lower standard. When we want to demand action, then we should argue that there is an injustice in the world: that those who

² In Kantian terms, are we talking about duties of virtue (*virtutis*) or duties of rights (*juris*)?

cannot live a decent life have a claim on the more fortunate to do them justice.

My goal for this chapter is therefore to formulate a theory of justice focused on poverty that I can use in further chapters. First, I will introduce the term justice, to clarify the further discussion. Next, I will look at the theories of justice of three modern philosophers: John Rawls, who has written the most influential book on justice of the last century; Amartya Sen, who has described a new approach to look at poverty and justice; and finally Martha Nussbaum, who has built further on the work of Sen, but has given more attention to how his ideas can be put into practice by governments. I will analyze these three views to come to a theory of justice that will be used throughout the rest of this thesis.

2.1 Conceptualizing Justice

As we shall see, there are many different variations of the idea of justice. In very broad terms, justice is about “giving people what is due to them” (Swift 2006), as can be also read in the *Nicomachean Ethics* by Aristotle (350BC). It is not about what would be nice or good for people to have (giving that would be charity or virtue), but what they have a right to³. To which things and how much thereof people have a right, and how we make sure people get what is due to them, are issues on which the different conceptions⁴ of justice vary among each other. Often we cannot simply say that these conceptions are right or wrong and there may be no other choice than to agree to disagree.

The different conceptions of the concept of justice must be seen as the result of different goals, and contexts, and different starting

³ For a good explanation of how to interpret rights in the light of this chapter, see (Nussbaum 2000).

⁴ “The ‘concept’ is the general structure, or perhaps the grammar, of a term.... A ‘conception’ is the particular specification of that ‘concept’, obtained by filling out some of the detail”(Swift 2006, p. 11).

points; and they must be evaluated with these in mind. I will now first set out the playing field in which the different theories of justice contest, so that we have a basis from which differences between the theories can be analyzed. The playing field will be based on the prominent concepts in earlier thought on justice: social order, freedom and equality.

2.1.1 SOCIAL ORDER

The first concept, social order, marks an important distinction that we have to make in theories about justice: the intended goal. Is it aiming at a complete set of rules that will result in a perfectly just society? Or do we want a less demanding theory that may be easier to implement? These differences were already described by Plato (360BC): against the Socratic ideal of perfectly virtuous human behavior, some opponents posed a more practical position. Because Socrates idea seems so far from reality, they said that social order is based on reciprocity: arrangements for mutual benefits. This entails the idea that ‘what goes around comes around’; so when I treat someone badly, I can expect to be treated badly myself, so I better treat others like I want them to treat me.

Besides this schism between an ideal and a more practical goal, there are many different ideas of how to treat others well and what a good life for oneself looks like. Amartya Sen recalls (2009, p. 20-21) the Sanskrit notion of *matsyanyaya*, or ‘justice in the world of fish’, meaning that big fish can freely devour little fish. In the context of fish, this may very well be called just and notions from biology about ‘survival of the fittest’ fit this kind of justice very well. However, the people who would want this concept to apply in the world of man will probably form a minority, though they might very well exist.

2.1.2 FREEDOM

Freedom is a term that is often used in many different forms. As we will see, the biggest difference is that between ‘being free from

interference' and that of 'really being able to do something'. Two examples to clarify this distinction: consider that you are walking in a city and see a man begging for money. You only have a one euro coin, but you feel empathy for him and you have decided that when you reach him, you will give him that euro. But when you reach him, he suddenly pulls forth a knife and demands that you give him one euro. Frightened, you give him the euro and quickly walk away. The result would have been equal whether he had threatened you or not, but what about your freedom? Next, you are walking past an election location and you see a woman, who has the freedom to vote, ready to make her voice heard. But at the bottom of the stairs before the entrance, she looks up helplessly from her wheelchair. Nobody stops her from voting, but does she really have the freedom to vote?

2.1.3 EQUALITY

Equality is a less difficult concept, but there needs to be some caution about how the term is used. In its most strict (mathematical) form, equality means that two things are exactly the same. In the justice debates, however, a softer definition of equality is at play. This conception does not demand absolute equality on every point, but equality on points that are relevant. Thus when we are talking about equality, we must always give the characteristic(s) that the equality is based on, or otherwise it must mean the hard definition of total equality⁵. This means that we must always, as Amartya Sen puts it, ask ourselves: equality of what?

⁵ Claiming that all people should be equal is thus arguing for a world of clones, whereas claiming that all people should be equal in the rights they have is a more common stance.

2.1.4 FREEDOM AND EQUALITY

Though freedom and equality are sometimes thought to be fighting for the priority in theories of justice, Sen shows that this is a categorical mistake. Theories of justice, he explains, can be analyzed in terms of two different categories. The first category is that of the *relevant personal features*, and the second that of the *combining characteristics*. The personal features can be e.g. happiness, rights, resources or freedom and the combining characteristics can be e.g. summation, maximal minimum or equality. When we consider for example the standard utilitarian approach (which says that we should aim for the greatest utility) the relevant personal feature is happiness and the combining characteristic is summation (Sen 1995).

In discussing theories about justice, we thus need to look at (at least) three aspects: the goal of the theory, what it is that we should look at to evaluate the position of a person, and how we want that evaluation to take place. With these three points in mind, I will now discuss three influential modern theories of justice.

2.2 Theories of justice: Rawls, Sen and Nussbaum

After the Second World War, welfare steadily increased in the Western world but so did the social and economic inequalities. In many European countries, these inequalities were dampened by extensive social welfare systems, but less so in e.g. the United States (Bourguignon and Morrisson 2007). The problem of how to deal with these inequalities led to a new attention to justice. In this section I will give an overview of three different conceptions of justice. The first is John Rawls' theory of justice as fairness. His theory has been very influential in this field and no work on justice can do without either stating how it is influenced by Rawls or where it differs from Rawls' theory. The second and third theories are two versions of what is called the Capability Approach. This approach is often used in theoretical as well as empirical discussions about poverty and

therefore fits in well with the focus of my thesis on poverty. The Capability Approach was pioneered by Amartya Sen in the 1980's. In the 1990's, Martha Nussbaum joined him in the development of the approach, but they have distinct conceptions of the approach.

2.2.1 JUSTICE AS FAIRNESS: RAWLS

John Rawls (1921-2002) was an American political philosopher and a professor at Harvard University. In *A Theory of Justice* (Rawls 2005, original 1971), he puts forward an argument for a liberal moral and political ideology that is still very influential. Rawls' search for the principles underlying his theory of justice starts from the *original position*. In this thought experiment, people come together to decide upon the laws of justice that they would want to live by. But these are not people from the real world – after all, it is a thought experiment – but people that are separated from the real world. They are, as Rawls calls it, behind a *veil of ignorance*. They do not know what physical characteristics or talents they would have in the world, nor do they know their social status or their wealth. These natural endowments are all results of the *natural lottery* and, from a moral point of view, they are distributed arbitrarily. Also, they do not know what they value in their life. They do however know about psychological and sociological aspects of human life⁶. Given this situation of the original position, Rawls argues that the laws they would choose will be a fair theory of justice: a theory consisting of a coherent set of principles (a *social contract*) that people will reasonably choose to live by. Based on these basic principles of justice, the people in the original position can then go further to generate laws to put these principles into action.

The next step of Rawls is of course to make a prediction of what would be the outcome of the deliberation in the original position.

⁶ One could question how universal these are, so perhaps they only know that there is also diversity on these points.

Because Rawls is not in the original position, there are some assumptions that he implicitly makes. These include that people need incentives to do extra effort and that people would prefer a higher chance of living a life as good as they can get above a small chance of living a life in wealth. Furthermore, he assumes that liberty is considered as something that is valued or at least something that is a necessary means for achieving things that are valued. According to Rawls, there can be two sets of principles coming out of this experiment, depending on the circumstances in society. When there are not enough resources to assure that every person has at least enough to maintain himself, the only principle is that all social goods should be distributed so that inequalities benefit those who are worst-off. More well-known is the other set of principles that should be in place when everyone's basic needs can be met. The first (and dominating) principle is then that basic liberties should be distributed so that everybody has a fully adequate system of basic liberty, compatible with similar systems for all. The second principle concerns the distribution system of social and economic goods (excluding liberty). The system should be such that inequalities are "attached to offices and positions open to all under conditions of fair equality of opportunity" and "to the greatest benefit of the least advantaged members of society" (Rawls 1993, p. 6).

The goods that are to be distributed according to this theory of justice are called the primary goods, and these include income, wealth, opportunities, and the social bases of self-respect. These primary goods are considered to be useful in the pursuit of the many different conceptions of a valuable life; they are thus valued as a means for an end. They are "things that every rational man is presumed to want" (Rawls 2005, p. 62).

2.2.2 CAPABILITY APPROACH: SEN

Amartya Sen was born in 1933, in what is now Bangladesh. His original field of expertise is (welfare) economics, and in 1998 he

received the Nobel Prize for his work in that field. He is currently a professor at Harvard University, where he worked together with Rawls. About a decade after the publication of Rawls' book, Sen started publishing about what he calls the Capability Approach. With the Capability Approach, he provides an alternative way of looking at and measuring poverty, which he has explained in several essays and books. Most of his ideas are brought together in his book *The Idea of Justice* (2009). In his own field, the dominating view was that poverty can be described by factors relating only to resources, like the Gross National Product, which sums up the economic value of activities in a country. Sen argues that there are problems with relying exclusively on such aggregated, resource-based indicators.

In the first place, aggregated numbers, like the Gross National Product give no information about the *distribution* among the people. The 80-20 'rule' illustrates this problem: the distribution of resources within (poor) countries often comes close to the situation in which 20% of the population holds 80% of the resources. And even when we look at the household level, there can be big differences in the shares of different family member (Sen 2001). Sums are therefore not very suitable for assessing poverty of individuals.

In the second place, people can be deprived in other ways than in terms of resources. Though resources surely help in attaining well-being and there is a correlation between higher income and better health and higher education, there are other important factors that contribute to well-being. Take, for example, Aung San Suu Kyi. She left her home and family in England and went back to her native Myanmar (Burma) to fight for the rights of her people. Though she won elections, the military junta stayed in control and placed her under house arrest. Even though she has quite some resources, especially compared with other people in Myanmar, she was deprived

of free movement (she did not even attend her husband's funeral), and freedom of speech⁷. Resources do not take these freedoms into account.

Thirdly, resources in themselves do not promote well-being. Only in their relation to a person and the environment can resources be converted into well-being. How this conversion happens depends on many different things: what Sen calls the *conversion factors*. The focus should therefore not be on the resources that people have, but on the freedom or capability that they can get from those resources. A person's capability consists of the different lives that person could live: all the doings and beings that are within a person's reach. Factors that play a role are physical characteristics, geographical location, social structures, personal skills etc. In Africa, thick clothing does not add much to a person's capability, just as a deaf person will get little excitement from a music CD.

How people will choose what capabilities they will realize (their functioning) is not of importance in the evaluation of their freedom, according to Sen. He does not want to look at realizations, because nobody is in a position to judge whether the functionings of somebody else are valuable. The approach of asking people themselves how they judge their lives will also not give a good impression, because people adapt their perceived happiness level to their situation.

It should be noted that Sen does not provide a full theory of justice. He only points out the weaknesses of other theories of justice: weaknesses that are based on what counts as poverty. What Sen argues for is to shift our focus from resources and realizations to capabilities, no matter what distribution we think is best for that.

⁷ Aung San Suu Kyi was given the opportunity to get her freedom if she promised never to return to Burma. This is an example of what Sen calls the difference between agency freedom and well-being freedom: she was offered well-being freedom, in exchange for her agency freedom (Sen 1995, p. 59-60).

2.2.3 CAPABILITY APPROACH⁸: NUSSBAUM

In the early 1990's, Sen was accompanied by Martha Nussbaum in his work on the Capability Approach. Nussbaum, born in 1947, is a professor of Law and Ethics at the University of Chicago. She studied philosophy at Harvard University, a period that she, as a woman, recalls as a struggle⁹. Nussbaum took the Capability Approach further and added more body to it from her background of legal philosophy. Compared to Sen, she goes further than merely giving a framework for evaluation: she wants to give a bigger theory of justice that includes a threshold level for each of the central capabilities that she lists and a justification for these capabilities and the threshold levels. She calls her theory (Nussbaum 2000) universal, focused on human capabilities, and "set in the context of a type of political liberalism" (Nussbaum 2006, p. 70) and she defends this at the beginning of this book, giving a justification for each important term in this description.

Following Sen, Nussbaum opposes resources and realizations as ways of assessing the well-being of people and focuses on what people are able to do: their capabilities. She distinguishes different kinds of capabilities: basic, internal and combined. Basic capabilities are those that we have from birth: hearing, sight etc. and internal capabilities are those that we develop during our life, like speech and reasoning. The combined capabilities are connected to the environment: they require not only basic and internal capabilities, but also the cooperation of others or the possession of goods.

⁸ Nussbaum calls her approach the Capabilities Approach, but to avoid confusion, I will only use the term Capability Approach, accompanied by the relevant author if necessary.

⁹ Martha Nussbaum Interview: Conversations with History: Institute of International Studies, UC Berkeley, <http://globetrotter.berkeley.edu/people6/Nussbaum/nussbaum-con1.html>. Accessed 16 February 2010.

Nussbaum also makes a case for universal values that are important for anyone, wherever that person lives. But she does not fail to identify the possible opposition to universal norms. Therefore, Nussbaum limits the norms to those “that are facilitative, rather than tyrannical”: they must be there “to foster a political climate in which [citizens] will each be able to pursue the good [...] according to their own lights, so long as they do no harm to others” (Nussbaum 2000, p. 59).

While Sen does not want to give a list of important capabilities, Nussbaum does just that (p. 78-80). These *central human functional capabilities* are about (1) life, (2) bodily health, (3) bodily integrity, (4) senses, imagination and thought, (5) emotions, (6) practical reason, (7) affiliation, (8) other species, (9) play, and (10) control over one’s environment, both (a) political and (b) material.

2.3 Comparison

The three theories I described do not nearly represent a complete discussion of the major philosophical approaches to justice. However, these three theories are in my opinion most important in finding a theory of justice that can be used to assess the life of the poor. I will now compare the theories of Rawls, Sen, and Nussbaum with each other and also discuss some of the critiques from other theories. By considering these different arguments for and against the presented theories, I will construct an argument for what is, in my view, a theory of justice that best suits the specific purpose of assessing the lives of the poor.

Earlier, I already introduced some points that are important for the analysis. In the first place, it is important to see what the goals of the theories are and what this means for the demands it puts on individuals and society. Secondly, the theories that I introduced give high priority to the autonomy of individuals and I will see whether this really is the most important thing to consider. In the third place, I will look at the different ways in which inequalities can be measured

to decide on the measure that is best suitable to define poverty. Finally, I will discuss the different ways of dealing with inequalities to decide on the best method of distribution for all. I will end with how these theories of justice are themselves justified.

2.3.1 PRACTICAL GOALS OF THE THEORIES

Theories of justice are always about what system should be in place in a society. Of course, it should be a system that increases justice, as we will see in the following subsections, but it should also be a feasible system. When the system is complex or expects much of citizens, it will be less likely to be successful than a system that is easy to implement and does not pose much requirements on the citizens. Feasibility is thus the key aspect that I will now consider for the theories of Rawls, Sen and Nussbaum.

The theory of Rawls, following philosophers like Locke, Rousseau and Kant, fits in the category of *transcendental theories*. This means that the goal of the theory is to have a blueprint of institutions that will assure that a society will be just. As Rawls points out in the preface of his book, his theory of justice “constitutes the most appropriate moral basis for a democratic society” (Rawls 2005, p. xviii). According to Sen, however, a transcendental approach will not bring it very far, because it is too much an intellectual exercise and too little a practical possibility. A completely just system, as described by Rawls, requires people to perfectly cooperate in that system. They should all rationally accept that just behavior is the best way to act, and they should all have the same conception of justice. That last point is vital, but as already explained, there are many conceptions of justice and they are not all compatible. In fact, Rawls himself admits that there may not be one single set of principles that will result from the original position. He is not completely blind for the fact that what he describes is an ideal theory, but he chooses not to focus on the non-ideal part: “Nonideal theory, the second part, is worked out after an ideal conception of justice has been chosen; only then do the parties ask

which principles to adopt under less happy conditions” (Rawls 2005, p. 216).

Sen, on the other hand, does not have a theory that has such breadth. Instead of focusing on a perfectly just system, he wants to focus on actual systems and how they can be compared and, after that, improved in terms of justice. Sen’s approach is therefore more practical; however I do have a doubt about how well it will work in practice. Making small, manageable, steps might mean a gradual improvement in terms of justice, but how likely is it that it will give the best result? Perhaps a combination of less optimal individual steps will lead to more justice in the end. The ad hoc approach of Sen looks only at the problems at hand and seems to miss the grand scheme that Rawls offers.

Nussbaum also struggles with the problem of how a ‘good idea’ might be put into practice. She takes somewhat of a middle road: first, Nussbaum wants to reach a broad consensus about the central capabilities¹⁰ in the society (the grand scheme). When there is a good conception of central capabilities, these should be brought into practice through the political system: in democracies, the people themselves choose to implement these capabilities in their society by means of the available democratic tools. Internationally, there should be an urge towards non-democratic governments to adopt these capabilities in their policies too (Nussbaum 2000, p. 103-104). Nussbaum thus opts for defining the grand scheme first and after that the steps that should be taken to reach it.

Though I think that it is important to have a fixed goal in mind, the actual tools for reaching that goal should not be fixed, or at least not in a universal way. Because of different and dynamic circumstances, it

¹⁰ The way towards consensus is Rawls’ reflective equilibrium. This means that we look both at our system of norms and our intuition. When these are in conflict, we should look which of these two we think is incorrect and change it so the conflict is resolved. In the end this will result in a system that is in accord with our intuitions.

is unfeasible to have one implementation that will always work. In business terms, a society needs a mission statement, but how that mission is implemented is something that needs to be evaluated and adapted to the circumstances from time to time in a policy plan. Translated back to societies, it is good to have a constitution with a fixed view on the society, but the practical implementations should be in normal laws. Nussbaum's theory incorporates this with the central capabilities as a (democratically reached) constitution, but the actual implementation as an ongoing democratic process.

2.3.2 VIEW OF A GOOD LIFE: AUTONOMY¹¹

The theories of Rawls, Sen and Nussbaum all agree that the autonomy of individuals is an important good, because individuals should be able to decide for themselves what a worthy life is. With Rawls, this is apparent in the veil of ignorance that obscures the person's conception of a valuable life. In the Capability Approach, the key concept of capability is aimed at promoting "objectives that we have reasons to value". Rawls, Sen and Nussbaum ideas about what is valuable is an individual choice. Therefore, it has no place in the public debate; they are all supporters of autonomy as individual liberalism. But is autonomy really the most important issue, or are there other things to consider?

In the political spectrum, there can be said to be four positions, aligned on two axes. The first axis is the amount of redistribution by the government ('socialists' vs. 'capitalists'), and the second axis is the level of government regulation ('democrats' vs. 'republicans', 'left' vs. 'right'). The four quarters of this space then represent¹²

¹¹ A more elaborate discussion about (moral) autonomy can be found in (Christman 2009) or (Swift 2006).

¹² This is a more elaborate view than the traditional left vs. right view, but still a limited view. Different authors give different names to the axes and sections of the spectrum.

- ‘Libertarian’: little redistribution, little regulation;
- ‘Liberal’: more redistribution, little regulation;
- ‘Communitarian’: more redistribution, more regulation;
- ‘Conservative’: little redistribution, more regulation.

Rawls, Nussbaum, and Sen fall in the liberal quarter: the government should redistribute goods for increased equality, but should leave citizens the choice what to do with their lives. But not everybody agrees with a liberal view of the good life. Some will argue that the government/society has the right or even the duty to intervene in the lives that people choose to live. When the freedom of others is at stake, this is widely accepted, but when there is no obvious harm to others, opinions may differ. Should a government, for example, forbid or discourage smoking and euthanasia? Should it impose taxes to aid the worst off in society? Liberalism argues for individual freedom, but conservatives and communitarians will argue for government intervention.

For libertarians and conservatives, the amount of redistribution that liberalism demands is too much of an interference with individual freedom. Every form of redistribution means that some people, the best off, will have to give away a part of their income to those that are worse off. This introduces an inequality for the wealthy people: an inequality that has to be justified. According to some philosophers, these inequalities cannot be justified. For Nozick, a colleague of Rawls at Harvard, private property is one’s own and people should not interfere with other’s possessions. Nozick also denies that there is something like common goods: goods that are owned by men collectively. Therefore, there is no need for a strong government to keep that in order, but only a night-watchmen government that provides some services, giving people more autonomy. As an argument from a Kantian perspective, he claims that redistribution “uses some people as a means to other people’s ends” (Swift 2006),

something that should not happen according to Kant, who is also one of the philosophers that Rawls builds on.

Now, most people will not deny that autonomy is a good thing, but still many think that we need a government to keep a watchful eye. The most common argument against complete autonomy is that it will go too far. When there is no-one to tell them what not to do, people will have no limits for their behavior, as Nietzsche fears would happen after he said that “God is dead”. The social aspects of a human life would be ignored when the only thing we care about is the freedom of the individual. A society needs its members to work together to achieve common goals or avoid common pains. As Locke said, “ill deserves the name of confinement which hedges us from bogs and precipices” (Locke 1690, p. §57). Some government restrictions of autonomy may be well justified.

As can be seen in any democratic election, all quarters of the political spectrum have its followers and there is no argument that will settle the discussion once and for all. On the axis of regulation, I think that the autonomy of the individual is an important thing, as long as it takes into account the freedom of other citizens (both born and unborn). On the point of redistribution, I will save my conclusion for a coming subsection.

2.3.3 WHAT TO MEASURE

For a theory of justice, we need a way to measure the difference between individuals: the informational basis of justice (Sen 2001, p. 56-57). To decide upon the best measure for the evaluation of individual lives, I will compare three sorts of measures in this section, which are resources, capabilities and realizations.

Resources and liberty are the subjects of comparison that Rawls chooses. More specifically, he looks at the basic liberty and primary goods that a person possesses. With liberty, he means that “this or that person (or persons) is free (or not free) from this or that constraint (or set of constraints) to do (or not to do) so and so” (Rawls

2005, p. 177). Among the basic liberties, Rawls names political liberty, freedom of speech and assembly, liberty of conscience and freedom of thought, freedom of the person and the right to hold property, and freedom from arbitrary arrest and seizure. The other criterion that Rawls uses is that of primary goods: rights and liberties, opportunities and powers, income and wealth, and the social bases of self-respect. These goods are chosen because whatever personal view of the good, everybody would prefer to have more of these rather than less. But if we look closely, this is not what Rawls wants to measure, but is it what Rawls wants to distribute. In terms of measurements, Rawls only speaks in very general terms about welfare and identifying the worst off, but ultimately this comes down to wealth and income: to resources.

In the Capability Approach the resources are only marginally important in the measurement. Resources alone do not tell us how well we are really doing, because that may depend on many other things: the conversion factors. What really matters for the Capability Approach is what a person is able to do: a person's freedom. This freedom is more than the 'mere' liberty that Rawls demands, and includes the 'worth of liberty' that Rawls dismisses: people's "capacity to advance their ends within [this system]" (Rawls 2005, p. 179). For Sen, liberty cannot be seen, let alone be measured, apart from its worth. What the Capability Approach tells us is that we should look at what *that* (specific) person is capable of, instead of looking what *a* (average) person would be capable of. Again, we see the distinction between an all-encompassing 'ideal' theory and a much more practical theory.

Beside resources and capabilities, we can also look at the realizations, or *utility*, that a person really achieves. This approach takes into account the critique of Sen towards resources, which is that we have to take conversion factors into account. When somebody has a lower level of capability, then this will definitely result in low functionings. But the opposite is not necessarily true: if a man from

the Netherlands were to go on a hunger strike, he may (in terms of nutrition) temporarily have the same functioning as a refugee in Sudan. The objection against utility from Rawls, Sen and Nussbaum is based on the issue I discussed before: liberalism. Every person should be free to pursue his or her own conception of the good, and we have no absolute grounds on which we can favor one, chosen, way of living above the other.

In terms of practical feasibility, resources are the best candidate, because they can be measured relatively easily¹³, but they may not give all the information that we want to know. Utility faces the problem of interpersonal comparison: how do we know how much utility or pleasure two people get from performing the same action? Capabilities are also difficult to measure, so Sen gives three distinct ways of measurement based on the Capability Approach: comparison on (a set of) capabilities, comparison on income and some indicators of capability (see the HDI in Chapter 3), and comparison on the income adjusted with capabilities (raising the income when more capabilities are present and reverse)¹⁴. Though the first gives the best view of capabilities, the last approach is the easiest. But the easier the evaluation, the more things become invisible in the outcomes. Money cannot buy capability and the difference between hunger and starvation cannot be easily seen in income figures (Sen 2001). But even though a theory should be useable, convenience of comparison should not be a ground for the way in which we judge the life of persons.

¹³ In Less Developed Countries, expenditure can be a better measure than income, because income is often very irregular and people have a clearer idea of their expenditure than their income (White 2008).

¹⁴ I should note that, as we will see in the next chapter, some of the indicators based on the capability approach are actually functionings. Though these are functionings of a system and not of individuals

For evaluation of the lives of people, a focus on resources misses the attention for differences between people, while a focus on realizations misses the attention for the freedom to pursue one's own goals. Capability is the intermediate form that does take these two issues into account. For practical applications, however, the Capability Approach has to depend on the other two: capabilities do show correlation with income and realizations are easier to quantify than capabilities, so these can be used as indicators for the capability level, though they will never absolutely define it.

2.3.4 MORALITY: SEN AND NUSSBAUM

As I have already stated, the way in which Sen and Nussbaum want to put their versions of the Capability Approach into action are different. Sen offers a broad framework aimed at tackling one issue at a time, while Nussbaum wants to make progress along the entire front: "it applies to all social justice issues, and to the global world". Because of this, Sen refuses to give a list, because, as he states, that would require an ordering that cannot be given. Nussbaum's approach however does not need an ordering, because the social level of each central capability must be met. This does have implications for the possible solutions that are available, because there are far less solutions that satisfy the requirements of each central capability than there are solutions on just one issue.

It also is decisive for how we look at problems related to the social conversion factors. Sen gives more thought to the conversion factors than Nussbaum does. For Sen, the social conversion factors are givens that we should take into account when we try to find a solution for the problem. For Nussbaum, however, they are a part of the problem (though not necessarily the problematic part). Therefore, the social conversion factors of Sen have a place in the list of central capabilities of Nussbaum.

To give an example: Sen names (among others) "the prevalence or absence of crime and violence" (Sen 2001, p. 71) as a variation in

social climate that can affect the conversion of resources into functionings. So what does this mean? If you live in a violent part of town, but you have a lot of money to buy a good alarm system and an armored car, your capability is fine? Should we not, to a certain level, be able to choose ourselves what we spent our money on instead of letting the social circumstances dictate our spending? The latter is the position that Nussbaum would take.

2.3.5 JUSTIFICATION OF JUSTICE

A theory of justice needs a proper justification if we want to give it any power in the real world, because while we may acknowledge that people need things like food and shelter, we might argue that this does not affect us. We might argue that what people have is the product of their own work and that therefore there should be no redistribution. So can we justify the justice principles described above? Do all people have the right to a minimal level of capability? The big questions about autonomy and redistribution all come down to this justification of justice.

Sen and Nussbaum often fall back to Aristotle in their justification for a theory of justice based on capabilities. The argument is that human life (being a full human being) can be marked by the presence or absence of the most important functionings. By being born, everybody has the moral right to be able to live a life that is worth to be called human: we should see every single person as an end, not a means. A more theoretical justification of capabilities can be found in Gewirth (1998), who has stated the Principle of Generic Consistency (PGC) in which he grants capabilities to every human based on the fact that each person is an agent, i.e. a purposeful actor. Based on the observation that agents need freedom and well-being (a general description of capabilities) to be an agent, no human could claim these capabilities for himself and deny them to others. This justification can be seen shimmering through other justifications we have seen. A similar argument was already raised against Socrates:

humans agree on justice because otherwise other humans could harm their agency. Rawls' original position can also be traced back to this argument: it might have been you who was born in extreme poverty, so what theory of justice would you choose? Though these arguments may be very appealing, they can still be contested. History has shown several cases in which the PGC and related justifications were circumvented by claims that others were lesser people, who lacked the rights of full humans¹⁵.

The only relative safety we can have is a world-wide agreement on justice: a definition of the basic level of capability that every human being, no matter the circumstances, should have. Because, in the end, a justification of justice is no more (but also no less) than a general agreement: an agreement for which "uncurbed critical scrutiny is essential for dismissal as well as for justification" (Sen 2009, p. 387).

2.4 Conclusion

It is not surprising that Rawls' theory is still influential, because he points out many important points in the debate about justice and addresses them from the point of liberty. And few people would contest that liberty is an important thing to have. But when he fills in the details of his ideal system of justice, he seems to have made choices that left room for the Capability Approach to step up. At some points, it is hard to say that Rawls would really oppose the Capability Approach, especially when he speaks about compensating the worst off, but he chose to focus on the resources instead. Sen has made clear in his writings that this focus is not the best when we want to identify the worst off, because it does not show what these people can actually do with the resources they have. But it is with Nussbaum that I really find a theory of justice that can be put to use in the real

¹⁵ Tutsis in 1994, Jews in WWII, slaves throughout history, and so on.

world. Even though her definition of the list of central capabilities may be disputed, it gives a good starting point for further discussion.

So it is Nussbaum's version of the Capability Approach that I will use as a theory of justice in the rest of this thesis. In short, Nussbaum's theory has the following aspects:

- Judgment of individual lives based on *capabilities*
- A clear *list* of central capabilities
- *Democratic tools* for decisions on what should be on the list

3 CAPABILITY AND POVERTY

“It is not an unfortunate cluster of random events, nor differences in individual behaviours, that consistently keep the health of some countries and population groups below others. Where systematic differences in health are judged to be avoidable by reasonable action globally and within society they are, quite simply, unjust.” (WHO Commission on Social Determinants of Health 2008, p. 26)

In the previous chapter, justice was shown to be related to distribution. I have chosen for capabilities as the object of that distribution, in particular the basic capabilities defined by Nussbaum. In this chapter, I will look at poverty as capability deprivation and take a closer look at each basic capability and the ‘level’ of that capability around the world. After that I will look at who would count as poor by this standard, and where most of the poor people live.

3.1 Capability deprivation

In everyday use, the word poverty is mostly limited to the meaning of little financial assets. But this does not do justice to many people who are poor in other ways, because poverty is not limited to the financial dimension: poverty is multi-dimensional (Deneulin and Shahani 2009), it includes e.g. health, education and Rawls’ social bases for self-respect. Because when we talk about a ‘poor human’, it

essentially means that the person does not meet the standard of humanity. Not by his or her own choosing (that would make a *bad* human), but because of deprivation. A poor human lacks what he or she needs to live a humane life. Physical goods (alone) are not a good measure for this as I explained in the previous chapter¹⁶. In the Capability Approach, this ability to be a human being is defined as the ability *to do and be* what one wants. Another philosopher following this line of thought is Alan Gewirth, who sees humans as purposive agents, and agency is all about the ability to act or function (Gewirth 1998). So, just as we can say of soil that it is poor when it cannot function as the giver of nutrients to plants, a human life is poor when it cannot function as an agent. And whether that agent wants to be happy or just content, and whether he only needs basic goods or needs a wheelchair, those individual factors should not be fixed by a definition of poverty that looks only at resources or outcomes. A definition that looks at the possible actions of individuals is much more appropriate. For this, according to Gewirth, we need well-being and freedom, the two key characteristics of capabilities.

3.2 Capability Levels

Before deciding how this well-being and freedom should be distributed among people, and how to define what counts as poverty, I will give an overview of the current state of each of the ten central capabilities that are given by Nussbaum. I will not give a complete evaluation of the state of each capability in each country, but I will try to give an idea of the current capabilities levels, mainly in what are called Less Developed Countries (LDC's), either by data or by examples that stress the importance of the capability.

¹⁶ See (Laderchi, Saith, and Stewart 2003) for a more elaborate discussion of the merits and defects of a monetary measure of poverty.

3.2.1 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”

The capabilities of life and health will not likely be disputed by many, but they are not within everybody’s reach. A report of the World Health Organization (2008)¹⁷ gives an overview of the causes of death in different countries grouped by income level. For high-income countries, the major causes of death are chronic diseases and 70% of the population reaches the age of 70 years. In the low-income countries, however, infectious diseases take most lives and only 21% of the population reaches the age of 70 years. Though this capability cannot be guaranteed to everybody (not all diseases can be cured), these major differences in life expectancies – the injustice that whether you live is correlated to where you live – are a clear form of deprivation. Life is the minimal indicator of well-being, and that human right should not be denied when there is no lack of the means to sustain it (WHO Commission on Social Determinants of Health 2008, p. 26).

3.2.2 HEALTH

“Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.”

Health, both physical and psychological, determines to a large degree how well a person is able to do and be what he wants. At the root of this capability are the ‘social determinants of health’, which include social policies (and attitudes), politics and economics

¹⁷ The data in the report are from 2004.

(Deneulin and Shahani 2009). For nutrition, not only the amount of food is important, but also the variety of the food (Shetty 2008). Finally, decent protection from the environment by adequate shelter can prevent diseases by improving the direct environment of people (WHO Commission on Social Determinants of Health 2008, p. 64-65). On a global scale, the United Nations has set goals for fighting some of the major causes of death in the Millennium Development Goals, these are:

- halting the spread of HIV/AIDS, malaria and other infectious diseases,
- increasing the survival rate of children, and
- increasing the care for women around their pregnancy.

But the results so far are not that staggering. Yearly HIV-infections have only dropped by ten percent in the first six years; child deaths have declined, but not as much as hoped; and “fewer than half of pregnant women in developing countries have the benefit of adequate prenatal care” (United Nations 2009, p. 27).

In food supply, though great famines are not as common nowadays, they are still there, mainly in the Horn of Africa. Another threat is that part of the available food that is grown in LDC’s is exported to other countries or land is used for economically more interesting products, like bio-fuel. This can drive up the prices, leading to insufficient nutrition. UN rapporteur Jean Ziegler concludes that “we are looking at a 20-40 per cent increase in food prices between now and 2020. And the poorest ... will be unable to foot the bill.”¹⁸

¹⁸ Jean Ziegler, UN Rapporteur on food, quoted in Swissinfo. 2007. UN rapporteur calls for biofuel moratorium. Bern: swissinfo.ch.

3.2.3 BODILY INTEGRITY

“Being able to move freely from place to place; having one’s bodily boundaries treated as sovereign...; having opportunities for sexual satisfaction and for choice in matters of reproduction.”

Even though the capability of safety is valued by most people, there are still many people that suffer and die by the hands of others. But actual harm is not even necessary to have less of this capability: the fear of being harmed might already hinder people in their freedom to go where they want. For women and children, this capability is more often denied than for men: according to the Development Programme of the United Nations (2006), “[u]p to half of all adult women have experienced violence at the hands of their intimate partners”. A study by the WHO (2005) shows comparable, alarming estimates, but it also investigated the attitude of women towards violence (Figure 1).

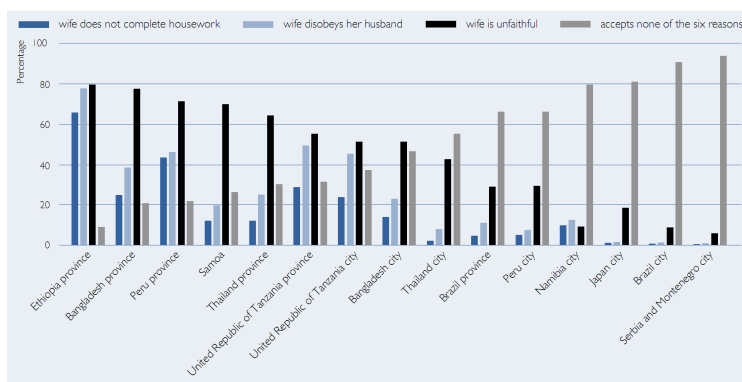


Figure 1 Percentage of women agreeing with certain reasons that justify wife-beating, by site

Those figures show the need for other capabilities like practical reason to break with social patterns that diminish the capabilities of women. A quote in the same report (p. 10) from a woman in Bangladesh illustrates the point:

“My husband slaps me, has sex with me against my will and I have to conform. Before being interviewed I didn’t really think about this. I thought this is only natural. This is the way a husband behaves.”

3.2.4 SENSES, IMAGINATION AND THOUGHT (EDUCATION AND EXPRESSION)

“Being able to use the senses, to imagine, think, and reason...”

This capability is described by Nussbaum with many different examples, but in general it comes down to the capability for mental development; in reasoning, knowledge and expression. For this capability, education¹⁹ is a resource that helps a person to develop a better view of the environment and his or her place in it. In addition, it also provides the tools for further reasoning (Young 2009, p. 259). Besides education, there are other important aspects of this capability: use one’s mind freely, act freely, and express oneself freely.

In education, things are starting to look a lot brighter on the global stage. The enrolment rates for primary education have risen steadily. In Sub-Saharan Africa, in 2008, 80% of the children were enrolled in primary education, up from 72% in 1995 and 52% in 1991²⁰. Differences between the enrollment rates of boys and girls have decreased from 14% to less than 5%. For the future, this means that education levels of men and women will be both higher and closer

¹⁹ Though education is often linked to literacy, this is a very narrow conception for this capability. Literacy is only a means for the mental capabilities, but in the end it is important that a person has the mental capability to reason. What education should be focused on is on what a person needs to know to live in his (changing) environment. This can include education about personal hygiene, basic health issues and nutrition, but also a focus on vocational training in more traditional societies (Young 2009).

²⁰ Data from United Nations Statistics Division for minimally 23 Sub-Saharan countries: <http://unstats.un.org/unsd/mdg/Data.aspx>.

together. However, it must be noted that these are only aggregates, and data grouped by income and ethnicity is not available.

Freedom of expression is much more difficult to assess, and the proxy used is often what treaties on human rights are signed by a country. But this says nothing about whether the treaty is followed and it also does not include violations by non-government parties, like criminal groups. Another proxy that gives a better view is that of the number of journalists' deaths. In these figures, politics only plays a small part, smaller than crime (including local crime) or corruption.

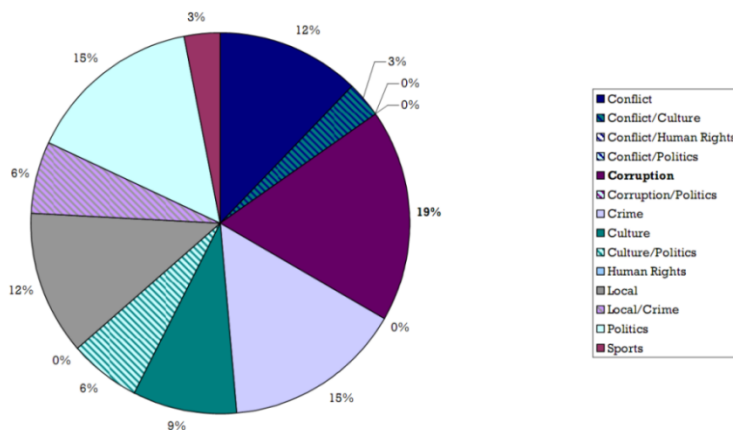


Figure 2 Deaths of Journalists in Jan-Jun 2010 Divided by Topics Covered²¹

3.2.5 EMOTIONS (MENTAL WELL-BEING)

“Being able to have attachments to things and people outside ourselves...”

²¹ Source: International Press Institute Death Watch June 2010. One has to keep in mind that the numbers are too low for a good evaluation. The total number of journalists killed was steady in 2010 and 2011, but rose in 2012.

Besides being able to develop one's mind, the capability to develop one's emotions towards others is an important capability, whether it concerns loving, grieving, longing or justified anger. According to Nussbaum (2000), people should not have their "emotional development blighted by overwhelming fear and anxiety" (p. 79). Especially children have a need for this capability for their emotions to develop normally or their emotions will "remain at an infantile level and are felt as threatening and shameful power, totally disconnected from the 'true' and 'adult' self." (D'Addelfio 2006, p. 10).

In LDC's, especially in those countries that are plagued by HIV/AIDS, many children are depending on care from others than from their parents. Families often take over the care for orphans within their family and sometimes foster parents can be found, or otherwise the children end up in social child care (Maundeni 2009). Private and social care-givers alike run into the problems of increasing demand, due to HIV/AIDS deaths. A friend who did an internship in a South-African orphanage wrote about the lack of attention for the children and how this affected their emotional development (van Rikxoort 2010). Life and health are the key capabilities that are provided in those places, because they do not have the resources to focus on other capabilities. Her experience fits the picture that is sketched in a working paper by Patrice Engle (2008), especially in the diagram in Figure 3.

CAPABILITY AND POVERTY

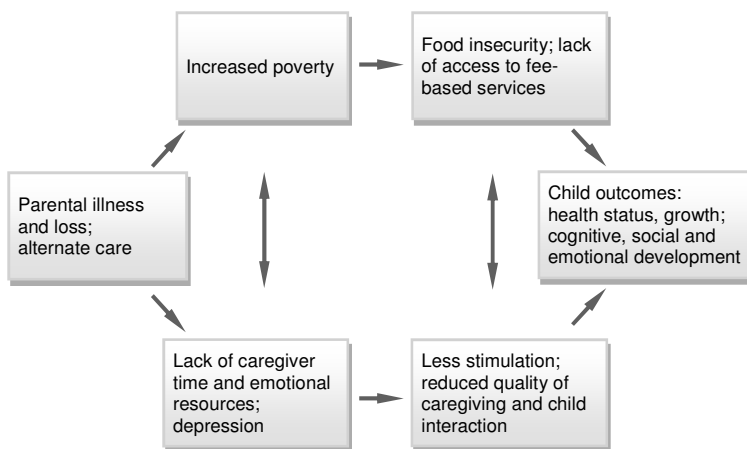


Figure 3 pathways to child outcomes (remake)

3.2.6 PRACTICAL REASON (CONSCIENCE)

“Being able to form a conception of the good and to engage in critical reflection about the planning of one’s life.”

The capability for practical reason relies heavily on the previous two capabilities. How much and what kind of education we receive, and how we develop emotionally will guide the conception of the good that we will form. In moral psychology, J. Piaget’s theory of moral development explains (Oesterdiekhoff 2009) that the morality of a child reaches higher levels by parental influences, cooperation and cognitive maturation. In addition to the development of morality, Nussbaum also mentions the ability to act upon one’s morality. This means that we should not restrain to do what we believe is right because our society will punish us for it. In all societies there are norms and values that are so entrenched that it is difficult to critically reflect on them, and when one does, it may prove to be hard to change them. Often the people who are in control (e.g. men, whites, Hutu’s or Arians), remain in control because they have a large

influence on the norms of the society and have developed the reasoning to support their rule. The flaw in the Principle of Generic Consistency of Gewirth (see page 26) is exploited by distinguishing between different groups of people, where the other group is denied the right to agency.

In Rwanda, in 1994, this could be seen at work, as is told by Rakiya Omaan, who was following the events from northern Rwanda (Montgomery and Smith 2004).

“In Rwanda they referred to Tutsis as cockroaches,” explains Omaan. “They were not human beings. This is very important to understand, [there are] very close parallels to what happened in Hitler’s Germany. [They said,] ‘Don’t worry; you’re not killing humans like you. You are killing some vermin that belongs under your shoe. You’re killing cockroaches.’”

3.2.7 AFFILIATION

COMPASSION TOWARDS OTHERS

“Being able to live with and toward others...”

When I visited Namibia, the most striking aspect of the poverty I witnessed was the lack of compassion. The daily struggle for basic needs can lead people to think only about their own interests, and only on the short term. Children are brought up in an environment in which (small) arguments are settled with anything that is sharp. One morning, this was brought to my attention, that same afternoon a small argument during a soccer match was about to be settled with the neck of a broken bottle. The institutions that constitute and nourish compassion, as Nussbaum calls it, do not exist or cannot reach all people, certainly not those at the bottom of society.

RESPECT

“Having the social bases of self-respect and non-humiliation...”

The minimum level of this capability, non-discrimination, is not completely absent in any society, but there are examples of extremes, such as the one discussed in capability 6. Another well-known example of this is the caste system in India, where people who are born in the caste of the untouchables have less chance and freedom to pursue their ends than people who are born in a higher caste²². The caste system, however, has no formal backing anymore and is prohibited in the constitution of India. Nevertheless, in the minds of the citizens, it still exists²³; that is where the minimum level of non-discrimination has to rise to that of respect.

3.2.8 OTHER SPECIES (ENVIRONMENT)

“Being able to live with concern for and in relation to animals, plants, and the world of nature.”

This capability is concerned with our environment. Injustice is visible here in the observation that most of the degradation in the environment is (probably) caused by the large consumption of rich countries that cause world-wide problems. Indirectly, the well-being of people is compromised by the changing environment: food supplies are in danger (Simatele, Binns, and Simatele 2012), and carriers of diseases move to new areas (Patz et al. 1996). But the living

²² This is a big difference with the ‘American Dream’, where everyone, no matter their status or background, can become important, even if only few actually succeed in doing so.

²³ An interesting book about this topic is Amartya Sen’s “Identity and Violence” (2006).

environment of people can also be affected more directly, as was the case with the Trafigura toxic waste incident²⁴.

The impacts of environmental changes on the lives of people in LDCs are visible in several ways. Changes in climate cause problems in fishing (Nellemann, Hain, and Alder 2008). Deforestation can threaten entire societies, and cause their collapse (Diamond 2005). Melting glaciers and water dams can cause flooding or drought etc. An example is “the Akosombo Dam in Ghana, completed in 1972, [which] has rarely functioned to projected capacity and created a wide range of ecological and human problems in the catchment area. Worse, however, were the downstream effects. In the two decades after the dam’s commissioning, a growing swath of beach in neighbouring Togo has disappeared, damaging roads, port facilities, fishing villages and threatening Lake Togo, an important wildlife habitat and source of human drinking water.” (Smillie 1991)

3.2.9 PLAY

“Being able to laugh, to play, to enjoy recreational activities”

The capability for play seems to be a somewhat odd one. In the fourth capability, Nussbaum already mentions the ability ‘to have pleasurable experiences’, so it is strange that it appears again as a separate capability. But though play may result in a pleasurable experience, for children it also helps to develop certain functions. Health and mental well-being are increased by recreational activities, and for children play is an important instrument to learn social and emotional skills. Pellegrini and Smith (1998) discuss several studies

²⁴ See <http://www.guardian.co.uk/world/2010/jul/23/trafigura-dutch-fine-waste-export>.

into the importance of play (exploration, fantasy, and locomotor) and experimental deprivation studies²⁵.

Little practical information can be found about this capability. There is however a relation between income poverty and recreation: those who have less to spend are less likely to participate in recreational activities, even when these activities are free of charge (Park, A. P. Turnbull, and H. R. Turnbull 2002, p. 6). The same paper reports that free activities for people with a disability are biased towards skills development and miss the real recreational aspect.

3.2.10 CONTROL OVER ONE'S ENVIRONMENT

POLITICAL (DEMOCRACY)

“Being able to participate effectively in political choices that govern one’s life...”

This capability follows up on the fifth capability: that of practical reason. Political influence helps to ensure that everybody’s voice is heard and everybody can have influence in how the society in which they live is organized. Without other capabilities, however, Sen argues that the capability is worthless, because when the capability for bodily integrity, freedom of expression, and practical reason are not present, the result of elections are not representative for the thoughts of the voters (Sen 2009, p. 327).

Though the news shows images of protest for more democracy in countries like Myanmar (Burma), Iran, Yemen, Syria, Libya and Egypt, democracy is facing a difficult time, according to the Democracy Index 2010²⁶ (Economist Intelligence Unit 2010), see Figure 4. In high

²⁵ Experimental deprivation studies test the hypothesis that children who are deprived from one of the forms of play will compensate for it when they are not deprived of it anymore.

²⁶ “The Economist Intelligence Unit’s Democracy Index is based on five categories: electoral process and pluralism; civil liberties; the functioning of government; political

scoring countries, the decline is mostly because of declining political interest under citizens (the political culture), and the rise of populists.

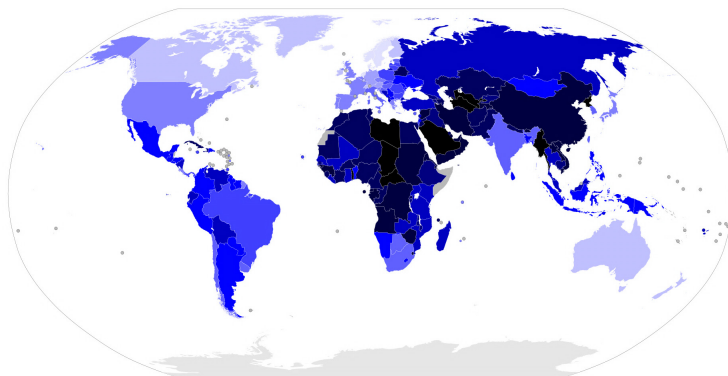


Figure 4 Democracy index 2010 (lighter means more democracy)

MATERIAL (PROPERTY)

“Being able to hold property, not just formally but in terms of real opportunity”

Nussbaum stresses equal opportunity in gaining property, and in a footnote mentions sex inequality in land rights as a reason to list this capability. But is private property, which Nussbaum means here, really a basic capability? Can publicly held property not offer the same opportunities for people? The fact is however, that most societies work with private property, and in that case, the acquisition and possession of property should be open to all. The world-wide differences in economic freedom are shown in Figure 5.

In LDC’s, the wealth of people is much lower than in more developed countries. In some cases, this has a direct relation with the political control over one’s environment. Thomas Pogge (2007, p. 48-

participation; and political culture. The index provides a snapshot of the current state of democracy worldwide for 165 independent states and two territories.”

49) explains that the *resource privilege* gives those who are in control in a country full ownership over the natural resources of that country. The rulers can sell the national resources and use the profits to benefit themselves and buy protection against opposition. Examples of this are the Blood Diamonds in Sierra Leone and the oil reserves in Nigeria.

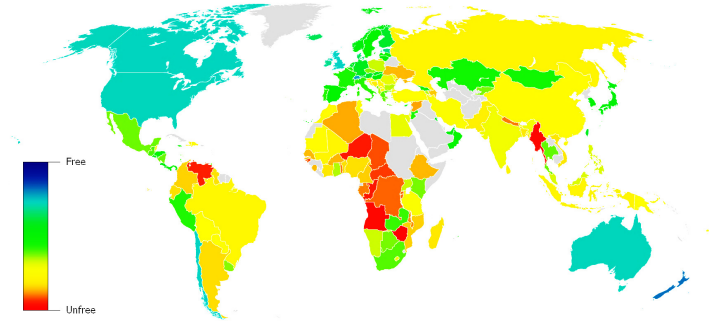


Figure 5 Economic freedom index 2010 (the Fraser institute)

3.3 Capability and Poverty

The differences in levels of capability are clear in many of the sources discussed. There are differences in health between high-income and low-income countries; differences in respect between social groups within a country; and differences in bodily integrity between men and women within households. But can we say that those who have the least are poor? What is a just distribution of capabilities and when is somebody counted among the poor?

3.3.1 A JUST DISTRIBUTION

I will look at three different distributions: equality, the difference principle that is proposed by Rawls and a social minimum that is proposed by Nussbaum²⁷.

Equality of capabilities (Strict Egalitarianism) seems like a very just distribution, because it would mean that there is no inescapable relative poverty and we could all be real equals. But this is not such an ideal situation as it seems. Equality of capabilities would mean a limitation of equality in other fields and even hindering people to fully utilize their potential. As an example, we can take the observation that women live longer than men, but that does not mean that men should get more healthcare to make up for the difference in life expectancy. Also, when a certain distribution will make everybody better off than before while another distribution has less advantage, but results in equality, the former would be preferable (Sen 2009).

Rawls proposes a system that is most to the advantage of those who are in the worst position. In the first place, Rawls argues for equality of the basic liberties. Rawls' second principle dictates that any inequalities in the distribution of resources should be "attached to offices and positions open to all under conditions of fair equality of opportunity" and "to the greatest benefit of the least advantaged members of society" (Rawls 2005). The second part is called the difference principle²⁸: any inequality in distribution of primary goods should benefit the least advantaged. According to Rawls, "the intuitive idea is that the social order is not to establish and secure the more attractive prospects of those better off unless doing so is to the advantage of those less fortunate" (p. 65). But why do the less

²⁷ For a more elaborate discussion about this topic, the entries about Egalitarianism and about Distributive Justice in the Stanford Encyclopedia of Philosophy are good sources, which also discuss some positions that I do not. A more elaborate discussion about equality and alternatives can also be found in the third chapter of Swift (2006).

²⁸ a.k.a. maximin principle

fortunate have more right to become better off than the most fortunate; is Rawls not introducing a form of inequality (in liberty) in his effort to minimize inequalities? Yes, he does introduce inequality, but only to counterbalance other inequalities: namely those of the Natural Lottery. Those who are lucky to have higher than average natural endowments or those who are born in a higher social class should realize that in no way they have earned that situation²⁹. Social classes and natural endowments are distributed randomly among newborns, but we could say that Rawls sees them as public goods that a person may use, but not claim as his or her own. The best off should use their higher capacities to help those who are worse off. As Rawls summarizes it: “In justice as fairness men agree to share one another’s fate” (p. 102).

But the difference principle does not mean that there is no unnecessary poverty: better off does not necessarily mean well. This is where we can use the social minimum that is proposed (among others) by Nussbaum. She argues for “a weaker focus on a (rather ample) social minimum” (Nussbaum 2000, p. 86). For the central capabilities that she proposes, she thinks every person should have at least the social minimum³⁰. Above that minimum, Nussbaum has no preference for any system of distribution, as long as it is judged in terms of (combined) capabilities. The level of the social minimum should be decided upon democratically. This debate should not be a one-time event, but an ongoing investigation. Over time, the threshold will change (mainly positively), like in Finland: the Finnish parliament proposed the right to a broadband internet connection for

²⁹ Technological developments might have an effect on this position however: eugenetics can make it possible to ‘cheat’ in the Natural Lottery, perhaps even replace the lottery completely.

³⁰ A more elaborate survey on the social minimum can be found in Stanford Encyclopedia of Philosophy

every household³¹. Rawls does not really object this social minimum, but only because he frames it as a special form of the difference principle. According to Rawls, in determining the social minimum, the person is led by the difference principle, without realizing it. So Rawls does not oppose a mixed conception of a social minimum with some other (fair) sort of distribution because that might as well be the result of (unintentionally) applying the difference principle³². The details of the social minimum are left over to the involved people themselves. They should, democratically, decide what capabilities should be enhanced and how this could best be achieved. According to Rawls, this is an almost impossible task. But then, it is perhaps just as hard to find out what way of distribution is for the greatest long-term benefit of those who are worst off. And nonetheless, any minimum that lies above the level of the worst-off now is an improvement, so there is no need to have the ‘real’ social minimum (though it should be the objective!) to apply this principle.

So equality is not the most just distribution of capabilities. For the entire society, the difference principle may be most beneficial, but it gives no guarantee that the worst-off are not still at an unacceptable level of poverty. A social minimum does offer that guarantee, or at least it voices the intent to prevent an unacceptable level of poverty, where the poverty line is decided upon by those involved.

3.3.2 POVERTY: RELATIVE OR ABSOLUTE?

But even when we let people decide for themselves about the poverty line, there is still at least one issue about poverty that remains. That issue is whether poverty is absolute or relative³³. Stéphanie

³¹ Ahmed, Saeed. 2009. Fast Internet access becomes a legal right in Finland. CNN.

³² Another possible outcome of the difference principle might be an insurance system such as that proclaimed by Dworkin.

³³ Sen often refers to adaptive preferences: people accept their low standard of living when they have no perspective of improving their living standards.

Chauvier calls poverty “an absolute and not a relative state. Its opposite is not wealth [...] but what one could call vital security” (Pogge 2007, p. 303). The lack of this ‘vital security’ has also been condemned by Peter Singer: “[S]uffering and death from lack of food, shelter, and medical care are bad” (Singer 1972). Vital security is here used as the determining factor for the evaluation of human life: the necessary condition for human action.

Now, we can ask whether vital security is, besides a necessary condition, also a sufficient condition for human action. For somebody living alone on an island, it will no doubt be sufficient, but people are part of a society: local, regional, national and increasingly global. “We are social and political animals from the start – not scattered individuals” (Blythe 2007, p. 7). Actions in the social environment require more than physical ability: they require at least non-interference (Gewirth 1998). This means that if we strive for eradicating poverty, the physical conditions can be seen as human rights that must be provided (Pogge 2007), while the demands for social conditions are limited to not denying others their freedom (cf. Rawls’ principles) to participate in social actions³⁴.

3.3.3 REDISTRIBUTION

Though capabilities may be the best measure for evaluating lives, they cannot be directly distributed. So what can we use to increase the capability level of people? Rawls has a clear idea: liberty and primary goods are the resources to redistribute. These are the things that every person wants no matter what else one wants: they are universal means to specific ends. In the Capability Approach, it is not denied that freedom and primary goods are important means for achieving

³⁴ When we take the vital security and the possibility of social actions together, we have the elements that Laderchi et al. (2003) consider best for evaluating poverty. They see the capability approach (focused solely on basic capabilities) as a good approach, but with the inclusion of lessons from theories about Social Exclusion.

capabilities, but it should not be our primary focus. “[Rawls] focus on advancing human freedom, is quite compatible with ... a direct concentration on the assessment of freedom, rather than counting the means towards achieving it” (Sen 2009, p. 234). This means that the primary goods can be used in the Capability Approach, but only as a means and never as a measure of justice. When deciding on a just distribution, we should take this distinction into account. We can distribute resources, but that should not be our measure of evaluation. Our measure of evaluation should be a person’s capability – though the two are often correlated.

3.4 Where are the poor?

Now that we have a set of capabilities that are important for evaluating human well-being, the next step is to see where there is poverty on these capabilities. To do this however, we need some kind of measure to evaluate the poverty in a certain place, region or country.

The most common measurement on a personal level is the USD 1 per day line: what one (US) dollar per day could buy (in 1991). People living below this line are often referred to as the ‘extremely poor’, while those who have up to double that amount to spend are the poor. Together, they make up 40% of the world’s population (Watkins and Macmillan 2007). As explained in the previous chapter, the Capability Approach argues against a purely economic evaluation of poverty and Sen has therefore initiated the use of the Human Development Index (HDI) by the World Bank. The HDI is a normalized weighed average of several factors: income per capita, life expectancy and (expected) years of schooling (Klugman 2010, p. 216).

Though not perfect³⁵, it is a more accurate measurement of poverty than income per capita alone. The HDI is a useful proxy for a comparison on the level of capabilities, but it is not exactly what we are looking for. The HDI is normalized, so the level of the top country in a category has a big influence on the results, therefore it cannot reflect on what should be the minimum level. Nevertheless, we can make general statements about poverty by identifying a HDI level below which the minimum is generally not met. In the HDR, the authors have identified limits, though probably not with a social minimum in mind. The categories that are identified in the HDR are (colors refer to Figure 6):

- > 0.793 Very High Human Development (Dark blue)
- 0.698 - 0.783 High Human Development
- 0.522 - 0.698 Medium Human Development
- < 0.510 Low Human Development (Lightest blue)

3.4.1 SOCIO-ECONOMIC CONTEXTS IN LESS DEVELOPED COUNTRIES

As can be seen in Figure 6, most of the countries with medium and low human development on the HDI scale are located in (sub-Saharan) Africa, followed by South-East Asia.

³⁵ The HDI is based on only a few indicators and it is based on aggregate data, so it does not take the variance within a country into account. The last point is addressed in the inequality adjusted HDI (IHDI).

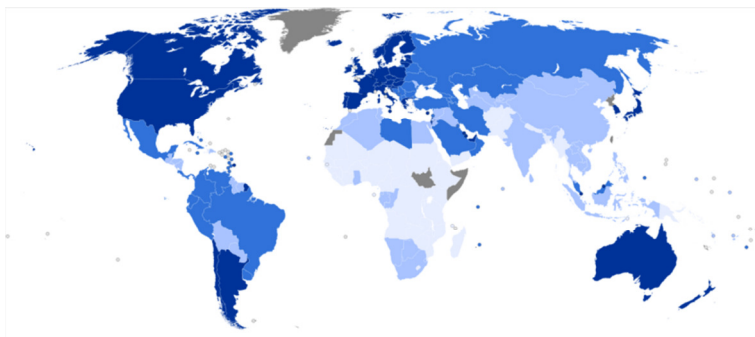


Figure 6 2011 Human Development Index

Though there are many differences between these LDC's, there are also many characteristics that they have in common. Adam Szirmai (2005) provides a list of common characteristics of those countries (which he mainly locates in Africa, South- and South-East Asia, and the former Soviet Union, based on GNP). Of course not all characteristics apply to all LDC's, but all LDC's show at least some of these characteristics. The list has different kinds of characteristics; some describe the socio-economic context, while others are the result of other factors. The list of nine characteristics that Szirmai gives in his book (p. 28) is literally:

1. Widespread (income) poverty and malnutrition
2. A relatively large share of agriculture in output and employment
3. Pronounced dualism in economic structure
4. Very rapid growth of population
5. Explosive urbanization
6. Large-scale underutilization of labour
7. Political instability, pervasive corruption
8. Environmental degradation
9. Low levels of technological capabilities

Some of these characteristics are directly related to capabilities, while others are of a more environmental type.

3.5 Conclusion

Poverty has an absolute and a relative dimension. On the one side there are irrevocable human rights that enable vital security that must be provided to every individual at a minimum level. On the other side are social goods, that determine how well we are off in relation to others; in attaining those, none should be hindered. For measuring poverty, there are many data sources we can choose from, of which the HDI is the closest to the capabilities approach. Geographically, poverty mainly exists in Africa and South-East Asia.

4 TECHNOLOGY AND CAPABILITY

“Why has man changed the shapes and substances of his environment? To change what it affords him. He has made more available what benefits him and less pressing what injures him. In making life easier for himself, of course, he has made life harder for most of the other animals.” (Gibson 1986, p. 130)

The Capability Approach tells us that capabilities are a combination of a person’s individual conversion factors and his or her environment. Nowadays, a large part of this environment is artificial (Simon 1996): on a typical day, we wash with water that is treated with chemicals, we eat products with all kinds of additives, and we walk on fabricated stones past plants and trees that were planted. In our ‘country-side’ the fields are separated with ditches and barbed wire, and the forests are partially planted and well-tended. In our offices, we communicate with symbols by means of artificial equipment, and the air that we breathe is ‘conditioned’. Because our environment is so artificial, our capabilities are also influenced by the technologies³⁶ that shape our environment.

³⁶ For technology, I will consider those things that are synthesized by human beings and can be characterized in terms of functions, goals and adaptation. These are two of the four characteristics that Herbert Simon names for the ‘artificial’.

In this chapter, I will discuss in which ways this can happen. I will start by shortly covering the place of technology in the formation of capabilities in existing works. Next, I will discuss how technology can influence its environment. After that, I will combine these two into a dynamic view on the influence of technology on capabilities.

4.1 Technology in the Capability Approach

I will start by describing how technology takes a place in the original writings on the Capability Approach. A much-used reference for this purpose is an overview of how capabilities are formed, given by Robeyns (2004). This overview can be found in a paper in which she discusses the Capability Approach and the different positions that Sen and Nussbaum take. Robeyns calls it “a stylized non-dynamic representation of a person’s capability set and the social and personal context of this person”, and I have reproduced this overview in Figure 7.

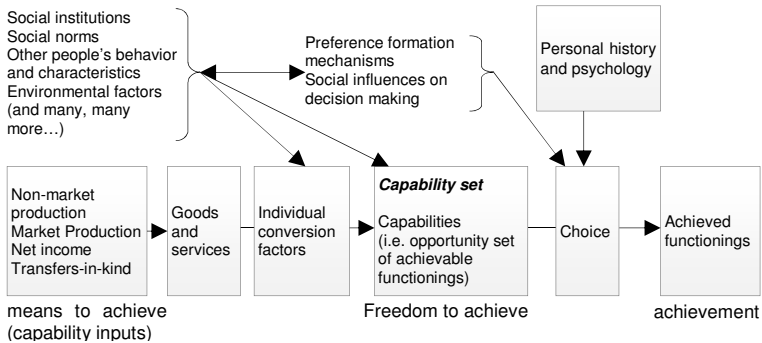


Figure 7 Schematic representation of capability formation (original in Robeyns 2004)

From this diagram, we learn that a person’s capability set result from resources and the environment, and how these two are converted by individual conversion factors. Furthermore, it shows how the capabilities in this set are transformed into functionings by

choices that are influenced by a person's history and his or her environment.

This image gives a good overview of how capabilities are formed and how they result in functionings. However, technology plays only a very small role in this original conception of the Capabilities Approach. Technologies are limited to 'goods and services' in Sen's view (and in the diagram) and to material circumstances in Nussbaum's view (Johnstone 2012, p. 85). The original ideas about the capability approach fall short when we try to clarify the role of technology in the process of capability formation. In order to evaluate the role of technology, we need to expand the original ideas about the Capability Approach.

4.1.1 RECENT DEVELOPMENTS

Recently, the landscape of work on the Capability Approach has started to change. In the past decade, scholars have slowly started to look at the relations between capabilities and technology, as I intend to do in this chapter. Literature references to such studies can be found in the introduction to "The Capability Approach, Technology and Design" (Oosterlaken and van den Hoven 2012) and in a book chapter by Justine Johnstone (Johnstone 2012).

But even with this growing attention for this topic, Johnstone notes that "relatively little has been published", though new collections of work on the topic indicate that the Capability Approach "is making an impact"³⁷ (Johnstone, p. 88); in other words, that the attention for the subject is growing in the field of Philosophy of Technology. Yet the field of 'Technology & Capability' is still in a developing phase: most of the publications up to four years ago stressed the importance of linking the two (Oosterlaken 2008, 2009; Zheng 2007), or were

³⁷ Though I was not able to take notice of most of the recent publications (2011 to 2014); where I could, I have tried to relate these to the views I propose here.

case studies of a particular technology, especially ICT (Garnham 1997; Johnstone 2007). To my knowledge, there has not been an earlier work (before 2011) that has reflected upon the relations between technology in general, its environment (context) and capabilities, or at least not in the context of Less Developed Countries.

4.1.2 THE ONTOLOGY OF CAPABILITIES

There is, however, a relevant article by Smith and Seward (2009) about the ontological basis³⁸ of the capabilities. Their view builds further on the ontology of capabilities defined by Martins (2005; 2007). The core of this ontology is formed by a combination of structures and mechanisms.

Structures can be seen as networks of objects: different objects are in some way connected to each other, like for example the blades of a mill, its axis, and the millstone are connected. These are examples of a physical structure, but the objects can also be persons or immaterial objects, like the miller and the grain-market.

The *mechanisms* are what allow a structure to cause a certain result. In the case of a mill, it is the specific placement of the objects that makes it possible that the millstone turns when the wind hits the blades.

Smith and Seward translate this ontology to capabilities, and say that a capability consists of a structure and its associated causal mechanism. This causal mechanism is not a straightforward causality of ‘*a causes b*’, but is less deterministic: ‘*a tends to lead to b*’. In this view, structures are formed by a person (and his or her conversion factors), and the objects in his or her environment. The combination (structure) of these objects behaves in a way (mechanism) that results in a capability that can, or tends to, lead to a functioning.

³⁸ An ‘ontological basis’ describes “what it is”; how we can think and talk about it.

4.1.3 TECHNOLOGY IN THE ONTOLOGY OF CAPABILITIES

Oosterlaken (2011) notes that Smith and Seward include social structures in their ontology, but do not “discuss the relations between people and technical artifacts”. She argues that technologies can and should be included in this ontology, just like the social objects. This would result in a network of physical and social objects. Such networks are a central part of Actor-Network-Theory (ANT). Pim Janssen (2010) applied this theory for a project in Zimbabwe, where MP3-players were used to disseminate knowledge of cattle management. The network shown in Figure 8 shows a structure of material objects, institutions and persons.

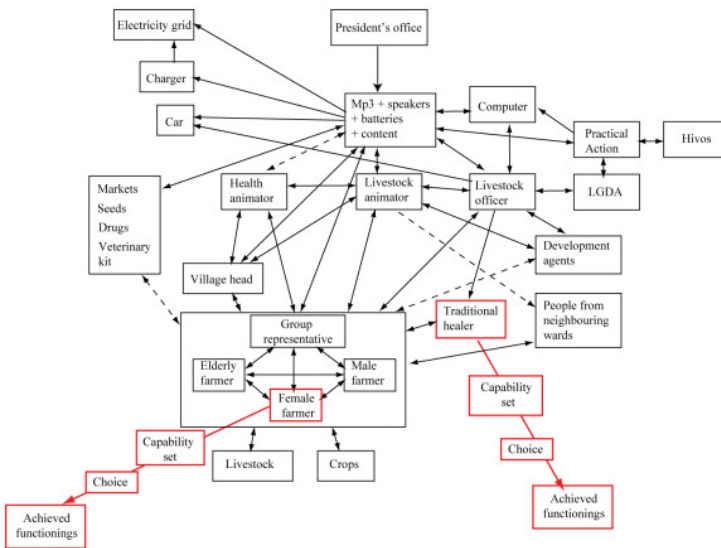


Figure 8 Representation of the coming about of human capabilities (including the further steps towards functionings)

The figure is very suitable to identify the different objects in the network, but what it is missing is the nature of the relations between objects (the mechanisms) and the characteristics of objects. Leaving

these out of the picture seems to imply that the quality of the relations and objects is less important than their existence. But that would not do justice to the *mechanisms* that are behind these relations. Therefore, in the rest of this chapter I will try to give technology its rightful place in this ontology and fill in the relations between the objects. I will go further with describing the kinds of objects and their relations.

4.2 Influence of technology

In the field of Philosophy of Technology there are many examples of influences of technology. Langdon Winner (1980) argued that Robert Moses designed overpasses around the center of New York so low that the busses could not pass under them. This prevented the predominantly black, poor people from reaching the beaches of the rich, white population. Bruno Latour (1992) names speed bumps and weighted hotel keys as technologies that influence our behavior. Setargew Kenaw Fantaw (2006) studied the influence of mobile phones on the Ethiopian society. Evan Selinger (2008) questions the Grameen Bank's initiative of the Village Phone project that enforced the traditional gender injustice. Different technologies, different contexts, and different problems; the range of technologies and their influences is too broad for a short answer on the influences of technology. A good framework can help in showing us where we could look for these influences.

The framework that I will start from is described by Brey, who follows Richard Sclove in the "typology of ways in which artifacts have been claimed ... to affect their context of use" (Brey 2006, p. 71). This framework distinguishes between the *affordance* and *constraint*: the possibilities that it opens up and bars. This goes back to the same basis as the Capability Approach: what a person is able to do and be. There are five types of influence that Brey distinguishes and that I will discuss below: behavioral, user-profile, material and infrastructural, social, and cultural.

4.2.1 BEHAVIORAL

Technologies can have an influence on the behavior of people. Often this is by design, though this does not have to be the case. For examples, we can take a look at the technologies surrounding cars. Speed bumps induce the behavior of driving at a slow speed (Latour 1992), as was intended in their design. Traffic lights and roundabouts both enforce letting other cars to cross your path, though in different ways. The way that highway ramps (clover leaf styled) are designed allow drivers to gradually reduce their speed when taking an exit and also gradually increase their speed when entering the highway. For some motor cyclists however, these constructions that invite going through a bend at a reasonable speed also invite to see where the physical speed limit lies, which is above the safe and enforced speed limit.

4.2.2 USER-PROFILE

The user-profile influences relate to the fixed attributes of users. Artifacts often require users to fit in a certain profile, a profile that the designers had in mind when they designed the artifact³⁹. To stay in the automotive realm: a standard car has several requirements for its driver. He or she should be able to use both legs and both arms.

In terms of affordances, technology can widen the user-profile by overcoming constraints, like adaptations to a car for people who are physically challenged.

4.2.3 MATERIAL AND INFRASTRUCTURAL

Besides presupposed user characteristics, there are physical conditions that must be met for the functioning of an artifact. Again, many of these are presupposed by the designers; in the automotive

³⁹ See (Oosterlaken 2012) for a discussion of Franssen's *typical user* and whether an artifact is 'good' for that user.

branch these are roads, gas stations, garages and car parts stores. But technology can also afford the construction of new infrastructures. The \$100-laptop (OLPC) extends the wireless network of other laptops, thus creating the infrastructure that would be necessary for other devices to access the internet.

4.2.4 SOCIAL

In the social influences, Brey distinguishes two areas: the informal statuses, roles and relations, and the formal organizations and institutions. Cars have also changed the relations between people. Before the cars were common, most people had to find work close to home, so with the advent of factories, company owners built entire villages next to the factory to accommodate the workers; as can still be seen in some industrial cities. People's private lives and work lives were centered on the factory they worked in. Cars changed this, because they allowed workers to live further away from where they work, and have different social environments for work and private time (Verbeek 2005, p. 43). And this is not only the case for those who have a car, but also for those who do not have a car, the non-users. So not only the users themselves, but also the non-users can be influenced by a technology.

In the organizational and institutional area, cars have also had their impact. Because of the increased speed and the large number of cars going to and fro, there are institutions that control the vehicles that may be used on the public road, that control the persons who may use the public road, an institution that maintains the network of public roads, an institution that controls traffic rules and signs, and probably even more.

4.2.5 CULTURAL

Finally, artifacts can also affect cultural meanings and cultural practices. New technologies can change the way in which we perceive the world: the governing mentalities⁴⁰ (“those widely shared values, norms, expectations, and assumptions of how the world operates” (Nieusma 2004)). With modern information and communication technologies, the world seems to be smaller, and cars, trains and planes add to that idea. We can now know what happens at the other end of the world within seconds, and if we want we can be there within a day, bringing along our own culture. In the automotive world, there are also cultural practices that have developed. This ranges from the many racing events to signs of politeness by blinking your headlights to let another car pass on a narrow road.

4.2.6 PRECONDITIONS

There is one strange thing in the way that Brey characterizes affordance: “[to] afford, enable, allow, induce, stimulate, cause, *necessitate or require* certain events or states-of-affairs” (p. 72, emphasis added). It includes what a technology *presupposes*, besides what a technology *provides*. This is quite contrary to the way in which Gibson, who introduced the term, used it. As a matter of fact, he explicitly names the preconditions (the context of use) for affordance when he gives the following example: “[a postbox] affords letter-mailing to a letter-writing human in a community with a postal system” (Gibson 1986, p. 139). Gibson names conditions that must be met before the affordance becomes real, so these conditions cannot be part of the affordance as Brey poses it. The consequence of this change in meaning is that Brey gives many examples of affordances which are in fact preconditions for that technology: he would name the postal

⁴⁰ The term was introduced by Campbell (2000).

system an affordance of the postbox, while in fact the opposite is true (though not sufficient).

But though the classification of the preconditions may be incorrect, this does not mean that preconditions are not important. This is what Herbert Simon (1996) calls the external environment of an artifact. As an example, he takes time keeping at sea: because of the swell on a ship, a clock that uses a pendulum does not work as it would on land. Neither does the misclassification mean that the distinction in the five influence types does not count for the preconditions. The observations that Brey makes concerning preconditions in his discussion about the different affordance types are thus not incorrect, they are merely in the wrong place. Besides the affordances and constraints, a technology also has preconditions that must be met.

So, in this section I have explained that the influences of technology can be found in five areas: behavior, user-profile, social, cultural and material. Besides having influences in these areas, technologies can also depend on any of these areas: certain preconditions must be met in order for the technology to 'work'. At this point, we return at the same level as the previously discussed ontology of capabilities. The *preconditions* and the technology form a *structure*, with *mechanisms* that tend to lead to *influences*.

4.3 A dynamic view on technology and capability

Given these views on the ontology of capabilities and the influences of technology, I will introduce a combined view of the influences of technology on capabilities. I will do this in three steps. The first is how capabilities are created. The second is the step from capabilities to functionings. The third and last step is how functionings influence the first two steps.

4.3.1 CAPABILITY FORMATION

In the diagram of Robeyns, the environment was merely a small list of social and environmental factors, somewhere in the corner. But as we have seen, the environment deserves much more attention. We can view the environment as everything outside the individual. Following the distinction in influences that we defined earlier, the environment has a social, a material (and infrastructural), and a cultural part. The two other types of influence, behavioral and user-profile, are related to the individual. Under the material environment I also count technology, limiting it to material technologies and thus excluding immaterial constructions, like currencies, writing, and mathematics, which could be gathered under the social environment; and arts, which could be gathered under the cultural environment⁴¹. The social, material, cultural and personal structures and mechanisms tend to lead to a person's capabilities. Essentially, we could call these structures and mechanisms the *context* in which an object is situated.

We have seen that for a technology, the material context can be of importance (the example of maritime clocks by Simon). But just like the material context is of importance, so are the social, personal and cultural contexts. An example of this is given by Jiehui and Kandachar (2009), who give an overview of projects for the 'Base of the Pyramid' at Delft University of Technology. One of the projects they discuss is that of woodstoves for cooking. The woodstove was first introduced in rural India, where it was very successful. When the same product was introduced in China, the people there did not like the product at all. It turned out that there were differences in cooking habits (standing or sitting) and dish sizes. These aspects of the cultural context were not foreseen and once the product was changed to reflect the local

⁴¹ Because I focus on technology, I will only include the influences of the material environment on the individual and the social and cultural environment. The other two fields share the same kinds of influences, but they are outside the scope of this paper.

context, the reception in China improved. For examples of different social contexts, one can think of discrimination; for examples of different personal contexts, one can think of people who are physically challenged. All in all, the context in which a technology is used is decisive for the capabilities it constitutes. When a product is well adapted to the context, and the user of the technology is able to use it (in other words, when all preconditions for the technology are met), then a technology can lead to expansion of the user's capability set. These are direct influences⁴² of technology on a person's capabilities.

THE ATTAINABILITY OF CAPABILITIES

In the Capability Approach, the set of capabilities of a person is often discussed. Most of the time, it is portrayed as a set of things that a person is able (and free) to do. Talking about a 'set' of capabilities introduces the risk that the distinction between capabilities and 'non-capabilities' is seen as black and white: the capability is there or not. But this would not do justice to the essence of capabilities. Most capabilities are not about being available or not, but are about the extent to which it is available. Implicitly, Gibson makes this observation when he states that man "has made *more available* what benefits him and *less pressing* what injures him" (Gibson 1986, emphasis added). Changes in capability sets are not from unavailable to available, but from scarce to more available. Sometimes the changes in characteristics are small, or a mix of positive and negative points (cf. Johnstone 2012, p. 87). In other cases, characteristics may change in such a way that a specific capability becomes reasonably unattainable. The poor in the suburbs of New York after the low-hanging overpasses were built could of course still reach the beaches of the rich if they went on foot, but that option is very unfavorable

⁴² Kleine (2010, p. 126) also refers to the direct and indirect influences of technology.

because of the time it takes: the *real opportunity* that marks a capability was no longer there.

As an example, let's look at mobile phones. Mobile phones have not suddenly allowed us to speak to each other, yet it expands our capability set for affiliation and practical reason. It does so by making it easier to talk to someone at a long distance and retrieving information from elsewhere. Before modern communication devices, people had to travel to achieve this; now, the communication is virtually instant. Mobile phones (and the fixed phones, and telegraph before) have made it less time consuming to communicate over long distances.

Seldom does a technology allow a capability that was not there before; in most cases, technologies make a capability more easily available by reducing the required amount of time, effort, costs, etc.

4.3.2 CHOICE

The introduction of a technology in a given structure with mechanisms changes the set of possible actions and results. Still, people have to choose whether they turn capabilities into functionings. An important factor in this choice is that capabilities can be realized in multiple ways and that the choice is often not *whether* we realize a capability, but *how* we realize a capability. Based on the perceived efforts and outcomes of a realization and our personal preferences, we make a choice between realizations. Let's take mobility as an example. For myself, when I need to go somewhere I take into account the distance (can I walk, or take the bike), luggage (can I carry it or not), infrastructure (is there a train station or are there parking spaces), the weather (will I get wet and will the trains be operational), the impact on the environment (is the time I could win really worth the possible damage), social contacts (do I want to have contact with people during the trip), time available (do I need to rush), costs (gas and train ticket prices), and my mood (do I feel like I could use a relaxed walk). For each consideration, different realizations have

different outcomes and in the end the total outcome that I prefer determines my choice⁴³. New technologies can have an impact on what the outcome will be by changing the (perceived) outcome for a certain consideration. For example, electric bikes have not only replaced conventional bikes, but also cars in the Netherlands (Hendriksen et al. 2008). An important factor that is not often found in the capability literature, but is found in examples of problematic introductions of technology is that of the impact on someone's social status. A few examples: instant formula for new mothers with HIV that is thrown away by these women because it shows that they are infected. Refusal of sorghum as food, because it is 'poor mans' foo. And finally, the fair-and-lovely skin whitening cream that will increase your status by lightening your skin was heavily criticized for the discriminatory nature of the television commercials that showed this effect (Karnani 2007). In this way, technologies do not directly influence our behavior, but they influence our (perceived) options, and through them our behavior.

4.3.3 INDIRECT INFLUENCES: FEEDBACK INTO THE CONTEXT

The influences of technologies go further than changing a person's capabilities and functionings. A technology can also have indirect influences: for users and non-users, short-term and long-term, visible and unnoticeable (cf. Johnstone 2012, p. 87). In these cases, the structure or the mechanisms that tend to lead to a capability are changed by the new technology⁴⁴. This can lead to new characteristics

⁴³ Not all decisions of course are made this explicitly. For more about (rational) choice, see (Sen 2009, chapter 8).

⁴⁴ These changes can be catastrophic for societies. Though large-scale catastrophic influences of technology do not immediately come to mind, other contextual changes (social and cultural) have led to the end of entire societies, as can be read in the book "Collapse", by Jared Diamond (2003).

of capabilities: people's opportunities and choices can be affected by the functionings that they themselves or others choose to realize⁴⁵.

This *feedback* step of functionings on the context of other capabilities (or the same at a later time) is not much discussed in the field of capabilities and technology, though it is essentially what fed the interest for the philosophy of technology. In the early decades of the field, the world saw major technological changes that did not fit the idea that technology changed things for the better⁴⁶. After the Second World War, the Cold War further 'demonized' technology with the ever present threat of a nuclear war. Philosophy of technology in these decades had the same sentiments that were present in society: Technology (with a capital T) destroyed what was good, and its development was unstoppable⁴⁷ (Brey 2010). This picture of technology has become more neutral, and Brey names as one of the action points for the field: "how do technological artifacts and practices affect ('act on') the environment in which they are introduced and used, how do they work to generate consequences, and on what other factors do these consequences depend".

These indirect influences of a product on the capabilities of people are not limited to the people who actually use the technology. When one person chooses to use a technology, it may affect the capabilities of others. Take mobile phones. If everybody owns a mobile phone,

⁴⁵ It can also lead to changing goals, and therefore a different set of basic capabilities, as explained by Coeckelbergh (2012).

⁴⁶ In the arts, this growing fear for technology can be found. In the movie *Modern Times* (1936), Charlie Chaplin shows "the frustrating struggle by proletarian man against the dehumanizing effects of the machine in the Industrial Age" (Tim Dirks on <http://www.filmsite.org>). In arts, Pablo Picasso painted 'Guernica' in 1937, depicting a town being bombed. In literature, the writings of JRR Tolkien about Middle Earth (written during and after WWII) show an aversion against modern technology, or at least against technology as a means for power and control (Bramlett 2005).

⁴⁷ Unstoppable like the magic broom of the sorcerer in the *Sorcerer's Apprentice* (Goethe 1797). Tolkien (writer and philologist), also stressed the identical root of machine and magic (Bramlett 2005); i.e. to be able, to have power.

and all preconditions are met, than everybody has the capability to contact distant people anywhere, anytime. That's a direct capability influence. When people choose to communicate only directly to people, the capability set is not changed any further. However, when a large part of the people choose to use mobile phones (a lot), then those people who choose not to use it see their capabilities diminish, because other people are not 'available' for direct contact anymore. This is an indirect capability influence.

4.4 Conclusion

The influences of technology on a person's capability set can be described in terms of influences and preconditions. The preconditions consist of the social, material, cultural and personal objects, gathered in a structure, or network. The relations between these objects reflect the mechanisms that work in these structures. The combination of these structures and mechanisms are capabilities: the tendency to lead to an action. In the capability approach, this tendency is reflected by the choice that individuals can make for which capabilities they will turn into functionings. Because technological objects are a part of these networks, they can have an influence on the set of capabilities that are available for a person, or on the choices that an individual makes between different capabilities or different paths to the same capability. When these capabilities are realized (as functionings) this can change the mechanisms in the network that constituted the capability at first. This can lead to a changing capability set, or to different individual choices in which capabilities to realize. The influence of technology is thus tri-fold: directly changing the capability set, influencing the (perceived) choice between capabilities, and changing the capability set and choices indirectly, through functionings.

5 JUSTICE, TECHNOLOGY & DEVELOPMENT

“An ethics of ... technology should open the black box of technology design and Development and describe its rich and heterogeneous content, and make an inventory of the degrees of freedom in the design and engineering process, which choices have been made and can be made, preferably before the problem becomes manifest, preferably before it is too late, preferably when ethics can still make a difference.” (van den Hoven 2007)

In the preceding chapters, I have talked about justice, (the lack of) human development, and the influence of technology. In this chapter, I will bring these three parts together. This will allow me to answer the main question of my thesis: *How can the lives of the poor be given attention and improved in a just way in the development of new technologies and the introduction of existing technologies?* From justice, I take the capability approach as the way to evaluate the lives of individuals. From poverty, I take that the capabilities of every individual should at least be that of the human minimum for every capability: the essential conditions for human life must be met and there should be no obstacles for the social capabilities. From technology and capability, I take that technology is connected to the social, material, cultural and personal sphere by means of influences and preconditions. Considering these answers, the main question can now be rewritten to “How can the minimum capability level for each person be reached

in the development of new technologies and the introduction of existing technologies?"

To answer this question, I will first identify problems with the existing situation. Next, I will discuss a process to evaluate a technology in terms of capabilities. Finally, I will discuss who should be involved in this.

5.1 Why to open the black box of technology?

In the previous chapter I discussed the relations between technology and the environment, where the environment is seen as a combination of the personal, social, cultural, and material spheres. These relations are not merely a theoretical framework to visualize relations between different areas. These relations are a reflection of the real world and a tool to comprehend why sometimes problems with technology emerge, and how we can try to prevent such problems. These problems are also not merely imagined or isolated, but there are many apparent problematic introductions of technology in LDC's.

Let's start small, with packaging. Almost everything we buy in a store comes in some kind of protective packaging, in most cases it is plastic, and sometimes it is made of paper or glass. In the highly developed countries, people are used to it, children grow up with it and there is an extensive system to dispose of it; there are even political debates about the best way to dispose packaging. As a result, most of the packaging is put in waste bins and is collected and processed. How different is the situation in less developed countries. When I visited Albania in 2002, there was a small river next to the town we were located, and at a bend in that small river, there was a huge pile of empty plastic bottles. People didn't know what to do with it, so they just threw it away. Likewise, in Namibia, there was a lot of litter lying around. And I heard a very plausible explanation for this behavior from somebody who visited the Bushmen in Namibia. He told that these people were used to the fact that everything around

them was organic and that the things that they could not eat or use could be thrown away. After all, it would eventually decay, being a part of the 'circle of life'. From that mindset, why would you collect your litter? If packaging is introduced in such a cultural context, how can we expect that people will dispose it in a waste bin, a thing they have possibly never even seen? And what if there is no garbage collection in the social infrastructure?

But technology does not have to lead to physical, environmental problems. It can also lead to social problems, or enlarge social problems. An example of this could be seen in India, where the skin complexion is correlated with social status. People with a darker skin are discriminated and have a lower social rank⁴⁸. This discrimination is morally wrong, and violates the capability of respect for a person. Apparently, a dermatological company thought that people with a darker skin should not be discriminated, and should have equal opportunities as people with a lighter skin complexion. But here is where we meet the difference between Sen and Nussbaum again. For Sen, increasing people's capabilities is enough, while Nussbaum has a much thicker conception of justice: a solution should also be morally good. The solution in India however was not morally good. In commercials, the new "Fair & Lovely" product was shown as a product that would raise your social status, by lightening up your skin (Karnani 2007). Instead of targeting the social problem of discrimination, it only made the problem worse: for those who could afford it, there was a way out of the lower social status, leaving those without the money, or the will, even worse off.

In the previous chapter I have already named the example of woodstoves and different cooking styles in India in China, and there are more examples to be found that stress the need for an increased attention to ethics (capabilities/values) in design. Its black box needs

⁴⁸ The same can be seen in other countries, like Namibia

to be opened; opened in two ways. Designers should have an eye for other factors than technology: new technologies should be developed with its (possible) use and effects in mind. From other fields, experts should look into the black box of technology and discover how it operates and interacts with their own field. This asks for an open mind from both sides, and it asks for imagination: “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’.” (Coeckelbergh 2010, p. 89). This can help in identifying possible problems in an early stage and take steps to prevent or mitigate them.

5.2 Capability Sensitive Design

So how should we develop a new technology, or evaluate an existing technology, that will take into account “what it does to our ‘capabilities’”? Oosterlaken (2009, 2012) argues for a capability sensitive design that is closely related to inclusive and universal design. It is “the idea that it is morally desirable that engineers think about how they can contribute to the expansion of valuable human capabilities” (2012, p. 227). What this means it that the appropriateness for the users and circumstances are taken into account while developing, and before introducing, the technology. Oosterlakens view is mostly concerned with the personal preconditions, more specifically the human diversity, and somewhat with the material preconditions. Human diversity in this view (which is that of the personal conversion factors of Sen) does not only include differences in personal characteristics, but also differences in a person’s circumstances. The cultural and social preconditions however are not explicitly mentioned⁴⁹, while these can also have an influence

⁴⁹ Even though these are part of inclusive design, that Oosterlaken uses as a basis for her design approach

on capabilities. In this section I will sketch out a process of evaluating a product, even while it is still on the drawing board, but it could also be used to evaluate the testing of prototypes.

The process of evaluation that I propose is based on the ontology of capabilities that I described in the previous chapter and the list of central capabilities described by Nussbaum. It consists of reasoning and imagining what the preconditions for the technology are and what influences the technology can have on each of the ten capabilities. I will start by applying this to a practical case: mobile phones. Next, I will go deeper into the meaning of the result of this case with respect to the preconditions and the influences.

5.2.1 PRACTICAL EXAMPLE: MOBILE PHONES

The question that should be answered during this process is how we can ‘reflect on the appropriateness’ and bring to the surface the ‘tradeoffs and hidden costs’ that are related to a new technology (Hamel 2010, p. 7). The elements for such an evaluation have already been discussed. These are:

- the ten basic capabilities defined by Nussbaum,
- the four spheres of context: social, cultural, material and personal, divided in preconditions and influences,
- the impact on users and non-users (whether it is direct, indirect or influencing the perceived options)

To organize these elements, I will make a table of positively and negatively affected capabilities. The rows of this table contain preconditions (P) and influences (I) for each sphere. Each of these preconditions and influences is evaluated for both users and non-users (the columns of the table). For mobile phones (limited to voice services to keep it manageable), I have filled in such a table, based on own observations and reasoning, two other studies (Fantaw, Verbeek, and Swierstra 2006; Forestier, Grace, and Kenny 2002), and

observations by others that I have read or heard in the past. The table is not intended to be complete, but it illustrates the principle of evaluating a technology.

		Preconditions / Influence	Users	Non-users
Social	P	A network of providers & pre-paid resellers		
	I	A money-based economy		
Material		I = Aggregation of individual choices		
	P	A network of cell towers (Forestier, Grace, and Kenny 2002)		
	I	A network of providers & pre-paid resellers Power supply (Forestier, Grace, and Kenny 2002)		
Cultural	P	Remote monitoring and controlling		
	I	Possible interference with critical equipment in hospitals and airplanes	- Health - Life	- Health - Life
Personal	P	Language-based communication		
	I	'Ring messages' (two rings = arrived safely) Marking 'territory' by (loud) ringtones (Gray 2011)		- Leisure
Personal	P	Ability to speak, hear and operate a device		
		Source of income		
		Maintaining contact with distant relatives and friends, to strengthen social network and absorb shocks (Frost and Sullivan 2006)	+ Affiliation	
		Getting access to information (market prices, work opportunities, health) (Frost and Sullivan 2006)	+ Reason + Health	
		Increased status (Fantaw 2006, p. 90)	+ Affiliation	- Affiliation
	I	Always being reachable/traceable (Fantaw 2006, p 93-94)	- Integrity - Leisure	
		Possible health issues caused by radio waves (Gaudin 2011)	- Health	- Health
		Have private conversations in public (Paul 2011)		- Leisure
		Interrupting conversation for phone call		- Affiliation
		Alternative for travelling (like water pipes (Verbeek 2005)) (Frost and Sullivan 2006)	+ Affiliation	- Affiliation
	E-Waste	- Environment	- Environment	

Table 1 Evaluation of the preconditions and influence of mobile phones

As can be seen, there is a wide variety of topics that are addressed. Professionals from different fields (e.g. sociology, anthropology, technology, medicine, ethics, and ecology) can all make valuable contributions to the evaluation.

5.2.2 PRECONDITIONS

From the results of this exercise, we can make the observation that preconditions are not directly linked to a specific capability. In fact, they may better be left out of the table and discussed separately, because they do require attention. If these preconditions are not in place, the capabilities of individuals can possibly not be attained.

MATERIAL PRECONDITIONS

The material preconditions firmly belong in the realm of design, and I trust that designers (for whom this process is envisioned) are aware of how to deal with these preconditions. Nonetheless, the analytical branch of the philosophy of technology may offer some interesting insights.

CULTURAL PRECONDITIONS

The cultural preconditions are at the other end of the spectrum. These require a good knowledge of the culture at a certain location, something that cannot be realized easily. For this, the help of people with knowledge of the culture (locals, or e.g. anthropologists) is necessary for a good evaluation.

SOCIAL PRECONDITIONS

The social preconditions I found to be more interesting, because the society it possibly is the most malleable⁵⁰ of the environments. De Bruijn and ten Heuvelhof (2000) have studied the structures and mechanism of society and described much of its dynamics in the textbook “Networks and Decision Making”. Essentially, their approach shares a common view with the SCOT-approach of Pinch

⁵⁰ Though corruption is possibly the most evident example of influencing society, this is not the only way, and not what I propose here.

and Bijker, but with a different perspective⁵¹. De Bruijn and ten Heuvelhof are more interested in using and shaping the network to ones desires rather than shaping the solution to the desires of the network. A big element in their view is the perception of the problem: if people are convinced that your solution addresses a real problem that needs to be addressed, they are more likely to support your solution. This can be achieved by broadening the problem, or by adapting the solution. In the end, a perfectly sound solution that is opposed by many people will do less for capabilities than a less perfect solution that people are happy to use.

PERSONAL PRECONDITIONS

The personal preconditions are most spoken about in the capabilities approach, because the approach includes the personal conversion factors. They are important, because people who do not meet the preconditions for a product, e.g. because of a disability or illness, are at risk of lagging behind. Now that our world is becoming ever more an information society, not having the skills to operate a computer can severely influence a person's capability level.

“The emergence of new capabilities is closely linked to the progress of scientific and technical innovations... Those with access to these innovations - and those who have the capacity to absorb them and use them - will have opportunities to reap social and economic advantages. Those without access and the appropriate capabilities risk being marginalized in the ‘knowledge societies’ of the future.” (Mansell and Wehn de Montalvo 1998, p. 10).

⁵¹ Earlier, I referred to Langdon Winner close to the phrase “opening up the black box”. Winner’s article “Upon opening the black box of technology and finding it empty” gives an interesting critique on the sociology of technology. Some lessons from that article are that we should look at the influence of technology (not just how it came to being) and that the term “relevant social groups” can be very biased, because it is unclear who decides which social groups are relative.

So these preconditions should get special attention when a product is evaluated. Which people will be unable to reap the benefits of the technology? And will that hamper their capability level? And what can we do to change this? Can we make the product more accessible or should we change the environment?

All these kinds of preconditions should be considered to make a good evaluation for a technology. An instrument that could help in doing this is by visualizing the network in which the technology should operate, as was done in Figure 8. By doing so, the technology can be adapted so that it actually creates the intended capabilities for as many people as possible.

5.2.3 INFLUENCES

To evaluate the influences of a technology, one can start with the ten basic capabilities. They form 'ethical signposts', that can guide us through our evaluation (Coeckelbergh 2012). Going through these capabilities, the question is: "how does the technology influence the capabilities of its users and of its non-users?" In this evaluation, we always need to take the context into account: the social, cultural, material and personal environment. In Table 1, the influences for the users are mainly limited to the direct capabilities, since these are relatively easy to assess. However, we also need to take into account that a technology can have indirect influences on capabilities. For non-users there are some examples of these. For example, mobile phones allow people to communicate with their friends and relatives that live far away. This means that the social network of people changes: relations between people far away become more intense, while relations with people close by can deteriorate. The result can be that people who do not own a mobile phone will have less capability of affiliation.

So far, I have treated the evaluation in general terms, and it can be applied to evaluate the influence of a technology. But an evaluation of better or worse is not enough when we include poverty in the

evaluation. For that evaluation, we need to evaluate whether the minimum level for each capability is met. We can then start from these minimal requirements and evaluate whether the technology brings us closer to reaching the minimum level, both directly and indirectly.

5.2.4 MULTIPLE ITERATIONS

When we make a change to improve the influence or make the technology available for more people, this again should be evaluated, because this can have an effect on different capabilities or a different effect on the same capabilities. This iterative approach to design is not without its flaw, because it limits the solution space in which we look. Once we have started evaluating a certain product and keep improving on it, we can become blind for alternatives. In countries with high levels of illiteracy, for example, computers that work with speech can increase the number of people that can use computers to expand their capabilities. Yet this reduces the need for these people to learn to read and write, something that may be more beneficial in the long run. Whether to adapt the product (making a speech-enabled system) or the environment (investing in a literacy program) is therefore an important decision that has to be made consciously and explicitly.

5.3 Act locally, think globally

So who should be involved in designing and evaluating a technology? Developing technology for people in LDC's with the idea of improving their living conditions is not new, and it is not something that is tied only to the capability approach. For decades⁵²,

⁵² The University of Delft had courses aimed at 'appropriate technology' more than 25 years ago (Riedijk 1986, 1987).

efforts have been taken to make the world a better place for all, but not all efforts have been equally successful. By looking at these efforts of the past, we can learn lessons for the future. A summary of these efforts is given by Ilse Oosterlaken (2008), who discusses three views on development for LDC's (the three views were originally introduced by Leach and Scoones as three races to 'the' top of development (2006)). After discussing these views I will evaluate which view best supports the approach described before.

5.3.1 THREE VIEWS

The first view on technology for development is that no specific technologies need to be designed and that LDC's are not treated differently from any other country. The idea is that the upper classes of the society will be affluent enough to purchase (advanced) technologies, including for production of new technologies. This will increase the size of the economy by the purchase, the resulting maintenance, and the increase in labor efficiency, thus stimulating economic growth. This economic growth will then *trickle down* to the lower levels of society and thereby raise their standard of living and create a middle class who can spend more themselves, increasing the trickle-down effect.

The second view is that specific technologies are brought to the LDC, which will have direct benefits for the entire population, or at least a large part of it. This is often called Technology Transfer. This view can be broken up into two different ideas, depending on the view of technology. The first is that of the Technological Fix: the idea that (a specific) technology will solve a problem wherever it is introduced. Technology is seen as a panacea and one size fits all. An example of this is the green revolution of the 1970's that was believed to rid the world of hunger. The second idea, often called Appropriate Technology, is that technology depends on the specific local circumstances to be successful and has to be tailored to each specific context.

The third view is that development in LDC's can best come from these countries themselves. According to this view, the best road to development is by letting people construct their own technologies that help them to develop: Grassroots development. An example of this is South-Korea, that invested heavily in setting up factories themselves and saw an enormous development from a mere copycat to important producer of state-of-the-art technology (Lall 2003). China has also seen an enormous development, but with virtually no foreign influence, though the overall (non-economic) level of development in China is still questionable. North-Korea, a country that took the same course, did not manage to develop as quickly as its big communist brother.

5.3.2 TAKING THE SOCIO-ECONOMIC CONTEXT INTO ACCOUNT

In the previous chapter, we have seen that technology is intricately connected to the material, social, personal, and cultural environment. Approaches that do not take this into account do not fit the part of our main question that the socio-economic context should be taken into account. No interference and the idea of a Technological Fix are thus not suitable. This does not necessarily mean that it can never be successful, but a technology that is brought to a LDC should not be introduced without thought, even though there might be some 'no-brainers', like medication and mosquito nets. The result of an inquiry into the construction and use of technology in a society may very well be that the negative impacts are negligible, or of a lesser order than the impact of not introducing it.

This leaves two options open: Appropriate Technology and Grassroots Development, which both focus on attention to the society and that can be used complementary. To start with the latter, a large part of technological development could be left to the people in LDCs themselves, perhaps with some financial (micro-credit) or intellectual support: they only need the "capability set for design" (Nichols and Dong 2012). This increases the chances that knowledge of the culture and society is taken into account while developing the technology,

something that is harder for outsiders to achieve. Regarding ICT for Development, Unwin summarizes this as follows: “Far too often, externally generated solutions have been imposed without sufficient attention being paid to these crucial factors, and this is one of the main reasons why so many ICT4D projects have failed to deliver sustainable outcomes.” (Unwin 2009, p. 119). But local knowledge may also include injustices: “Pre-existing structures, such as in the distribution of political power, economic and asset wealth or in gender relations, are very difficult to wish away by the best intentions of grass-roots activists, and indeed may become reinforced by their activities” (Parnwell 2008, p. 114). It can thus be helpful to look at the problems with a fresh eye. The pitfall of this help is that there is a risk that it becomes paternalistic, undermining the capability for design of the local people. “Centralized development decision making, often involving city-based ‘experts’, is generally too detached from local contextual realities” (Parnwell 2008, p. 113). What is claimed is that local circumstances can be best described by local people themselves. However, some technologies that may bring much improvement for a certain capability rely on knowledge or resources that are not present in the LDC. This is e.g. the case with E-Health: “Despite the great potential of e-health, many countries, especially in the developing world, are unable to derive benefit from it because they lack the capacity systematically to evaluate developments in ICT and make informed decisions about potential applications, country readiness for their adoption and adaptations to country-specific needs, circumstances and resources.” (Kwankam, Pablos-Mendez, and Kay 2009) In this case, working together with foreign experts may result in technologies that take the society into account, and also have a positive effect on the capabilities in the LDC. In the end, cooperation between local people and external experts seems to be the best way to develop and evaluate a technology in a way that takes the capability set of those affected into account.

5.4 Conclusion

The influence of technology on the environment is not merely a theoretical idea, but in some cases a real problem. People's capabilities can be greatly influenced by new technologies or technologies that are introduced in a new environment. Not in all cases does this mean an improvement, so it is important to consider capabilities before a technology is introduced. This calls for capability sensitive design, in which the capabilities of users and non-users are central. Especially users that do not conform to the standard are important in this process, because they run the risk of lagging (even more) behind. By including local actors in the construction of a technology, the local context can be taken into account when introducing a technology. Factors that should be taken into account are the effects on capabilities, the network in which the technology is introduced, and whether the technology can actually reach those who need its impact.

CONCLUSION

“The fight against the scourges of poverty, inequality, and the threat of environmental collapse will define the twenty-first century, as the fight against slavery or for universal suffrage defined earlier ages. Fail, and future generations will not forgive us. Succeed, and they will wonder how the world could have tolerated such needless injustice and suffering for so long.” (Green 2008, p. 249)

In the first chapter, I have discussed the concept of justice by looking at the view of Rawls, Sen and Nussbaum. Rawls’ theory is still influential, because he points out many important points in the debate about justice and addresses them from the point of liberty. Few people would contest that this is an important thing to have. But when he fills in the details of his ideal system of justice, he has made choices that have left room for the Capability Approach to step up. The main problem is his focus on resources. Sen has made clear in his writings that this focus is not the best when we want to identify the worst off, because it does not show what these people can actually do with the resources they have. What we should look at are the capabilities that a person has: the doings and being that are within reach of a person. Nussbaum goes further in this Capability Approach, and gives a list of ten capabilities that are important for every person. Even though her definition of the list of central capabilities may be disputed, it gives a good and practical starting point for further discussion. In short, Nussbaum’s theory has the following aspects: judgment of individual lives based on capabilities; a clear list of central capabilities; and democratic tools for decisions on which capabilities are on the list.

Poverty was the second concept that I discussed. Poverty has an absolute and a relative dimension. On the absolute side there are

irrevocable human rights that enable vital security that must be provided to every individual at a minimum level. On the relative side are social goods, that determine how well we are off in relation to others; in attaining those, none should be hindered. For measuring poverty, there are many data sources we can choose from, of which the HDI is the closest to the capabilities approach. The HDI is based on a combination of indicators of capabilities and income. Still, we should not forget that aggregated data always hide information about distribution, and a good evaluation of capabilities should be based on individual data. On many capabilities, there are still many people who do not have the minimal level; geographically, these people mostly live in (sub-Saharan) Africa and South-East Asia.

The effects of technology on capabilities can be described in terms of influences and preconditions. The preconditions exist of the social, material, cultural and personal objects, gathered in a structure, or network. The relations between these objects reflect the mechanisms that work in these structures. The combination of these structures and mechanisms are capabilities: the tendency to lead to an action. In the capability approach, this tendency is reflected by the choice that individuals can make in which capabilities they will turn into functionings. Because technological objects are a part of these networks, they can have an influence on the set of capabilities that are available for a person, or on the choices that an individual makes between different capabilities or different paths to the same capability. When these capabilities are realized, this can change the mechanisms in the network that constituted the capability at first. This can lead to a changing capability set, or to different individual choices in which capabilities to realize. The influence of technology is thus tri-fold: directly changing the capability set, influencing the (perceived) choice between capabilities, and indirectly changing the capability set and choices.

The described influence of technology on the environment is not merely a theoretical idea, but in some cases a real problem. People's

capabilities can be greatly influenced by new technologies or technologies that are introduced in a new environment. Not in all cases does this mean an improvement, so it is important to consider capabilities before a technology is introduced. This calls for capability sensitive design, in which the capabilities of users and non-users are central. Especially users that do not conform to the standard are important in this process, because they run the risk of lagging (even more) behind. Factors that should be taken into account are the effects on capabilities, the network in which the technology is introduced, and whether the technology can actually reach those who need its impact. By including local actors in the construction of a technology, the local context can be taken into account when designing or introducing a technology.

5.5 Evaluation & future research

So, has this study answered the question that I set out to answer? At least I have specified the direction in which the answers lie, and I have sketched out an approach to the answer. For concrete steps in the design and evaluation of technologies, the subject matter is too broad. Depending on the kind of technology and the context in which it is to be introduced, the exact steps for action should be filled in. The link between Actor-Network-Theory and Capability and Technology is one that might be interesting to investigate further, especially how the nature of the relationships in the network can be given more attention.

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